

APPENDIX N

Phase 1 Report

**WATERDOWN/ALDERSHOT MASTER EA
TRANSPORTATION NETWORK STUDY**

PHASE 1 – FINAL REPORT

prepared for the

City of Burlington and the City of Hamilton



prepared by:



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July 30, 2004



MASTER EA TRANSPORTATION NETWORK REVIEW

of

ALDERSHOT/WATERDOWN

prepared for

the City of Hamilton

and

the City of Burlington

Final Report

August 2004

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1.0 INTRODUCTION

1.1 Background

In September 1999, Stantec Consulting Limited on behalf of the City of Burlington and the Town of Flamborough completed the final draft of the Master EA Transportation Network Study for the Aldershot/Waterdown area with a view to identifying a future transportation network to accommodate urban development in the Waterdown and Aldershot communities. The study area was bounded by Highway 6 to the west, 6th Concession Road to the north, Cedar Springs/Brant Street to the east and Highway 403 to the south. Neither the City of Burlington nor the Town of Flamborough Councils took a formal position on the study findings and recommendations. Subsequently, the Town of Flamborough was dissolved and amalgamated into the City of Hamilton.

Since that time, an Order In Council (#1262/2002, dated June 19, 2002) has been passed by the Ontario Cabinet approving (OPA 28) expansion of the Waterdown urban area and the signed Memorandum of Agreement between the Cities of Hamilton and Burlington and the affected Flamborough landowners requires the completion of an Environmental Assessment Master Transportation Study.

As four years have elapsed since completion of the final draft of the Master EA Transportation Network Study, the Cities of Burlington and Hamilton now wish to review the results of the 1999 study to ensure they are still valid. The completion and approval of the Master Plan would fulfil Phase 1 and 2 of the Municipal Class EA process. Currently the project would be a Schedule C project, therefore, prior to construction, additional class EA studies would have to be completed to fulfil phase 3 and 4 of the planning process.

An update of the 1999 Transportation Network Plan was required because of a number of factors:

- environmental constraints were known to have changed in the meantime;
- planning for the Niagara-GTA Corridor (formerly the Niagara-GTA Corridor) has begun and is thought to have an impact on the need for east-west roads through the Village of Waterdown;
- a number of local road improvements have been made, including: expansion of the Dundas Street/Highway 6/Highway 5 intersection; widening to five-lanes of Dundas Street, east of Highway 6; channelization and signalization of the Hamilton Street/Parkside Drive intersection;
- the 407 ETR toll highway has since been extended to Burlington;
- a number of new developments have taken place in the study area;
- the previous report had not been approved by either Flamborough or Burlington councils and, therefore, had no official status;
- certain agencies had expressed concerns with the plan and these concerns had not previously been addressed; and
- the 1999 Master EA had effectively not been completed as it had not addressed final agency comments, it had not received formal approval and had not been filed.

A Steering Committee consisting of staff from the Cities of Burlington and Hamilton, MTO and the Region of Halton was set up to oversee the review. In addition, Secondary Plan studies are currently being initiated by the developers associated with OPA 28. In order for these studies to commence, they need to know whether the basic components of the previously completed Master EA are still valid.

The purpose of this review was therefore to *review all the land use and transportation network changes, either proposed or constructed, which may effect the study area conclusions and recommendations of the previous Transportation Master Plan Study undertaken by Stantec Consulting Ltd. in September 1999.*

1.2 Study Activities

The following tasks were completed in this study review:

- traffic counts had been completed for the area at most intersections during the past year;
- an origin-destination analysis of traffic entering and leaving Waterdown village along Dundas Street and Parkside Drive was undertaken in May 2003,
- environmental constraint mapping was updated with new Environmentally Significant Areas;
- a mail-out was sent to selected stakeholder government agencies and utilities in order to obtain an update on any issues that may impact the planning of roads in the area;
- the traffic needs analysis for the ultimate road network was updated;
- the interaction between the various Niagara-GTA Corridor options and the Waterdown area road network was assessed; and
- the previous Master Plan was reviewed based on this updated information to ascertain whether the route selection for the new roads is still valid.

The study area for this Master EA review is shown in **Exhibit 1.1**.

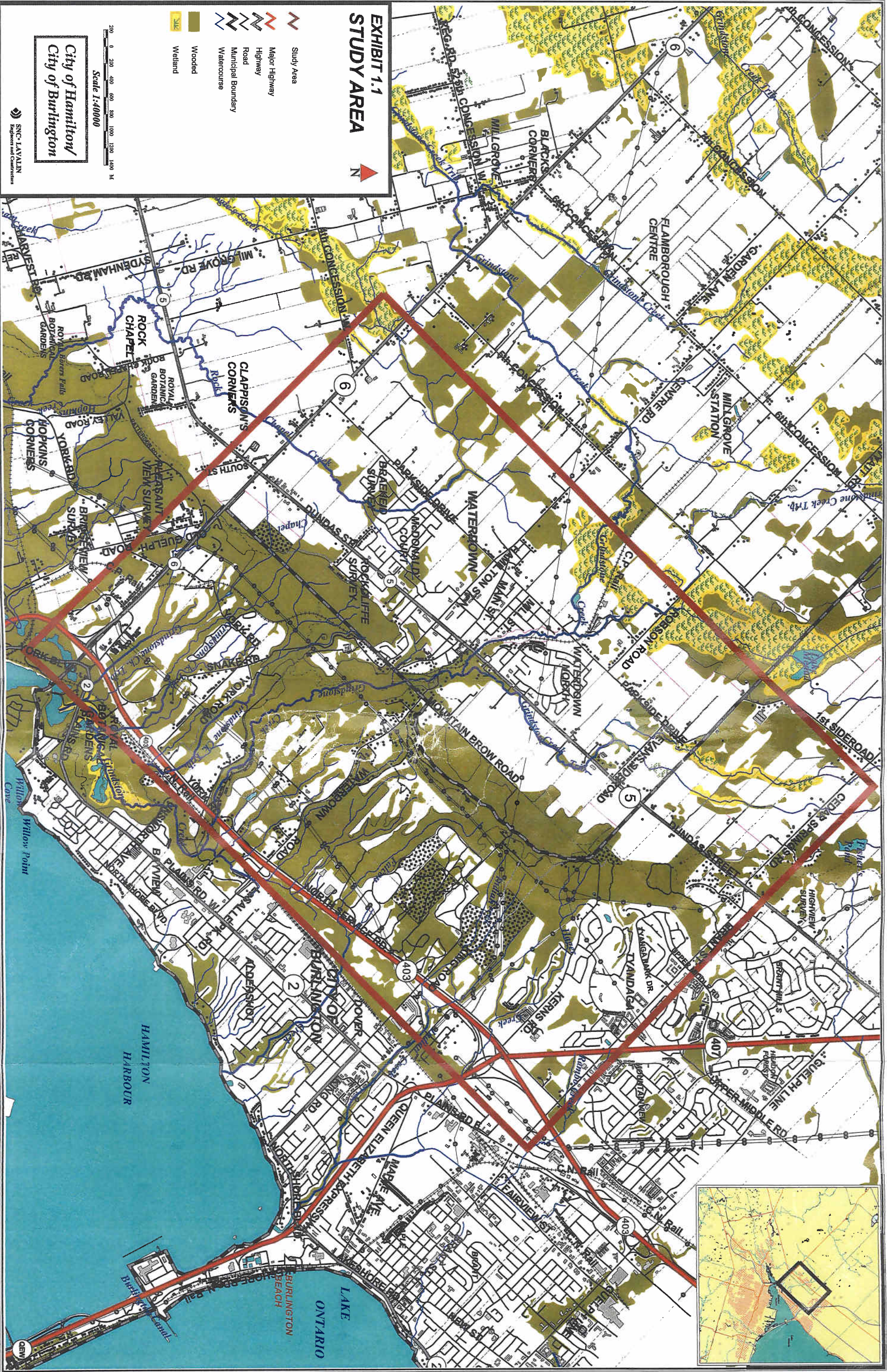


EXHIBIT 1.1 STUDY AREA



- Study Area
- Major Highway
- Highway
- Road
- Municipal Boundary
- Watercourse
- Wooded
- Wetland

Scale 1:40000
0 200 400 600 800 1000 1200 1400 M

City of Hamilton
City of Burlington

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2.0 REVIEW OF MASTER PLAN (1999)

The forecast volume/capacity condition on various screenlines were presented in Table 18 (reproduced below) of the *Stantec* report. The 1999 Master EA study preceded the opening of the 407 ETR West extension.

		TABLE 18 (from page 50 of Stantec report)				
		SCREENLINE VOLUME TO CAPACITY RATIOS (PM Peak Hour)				
Screenline	Direction	Link-based Capacity (vph)	Volume to Capacity Ratio			
			Existing	Short	Intermediate	Ultimate
East of Highway 6	Westbound	1700	0.64	0.76	0.93	1.11
	Eastbound	1750	0.57	0.81	1.19	1.41
East of Waterdown Road	Westbound	2000	0.90	1.10	1.25	1.30
	Eastbound	2000	0.57	0.72	1.00	1.32
East of Evans Road	Westbound	2700	0.59	0.71	0.94	0.78
	Eastbound	2200	0.33	0.41	0.58	0.71
North of Dundas St.	Northbound	4400	0.49	0.64	1.06	0.83
	Southbound	4400	0.39	0.47	0.70	0.75
South of Dundas St.	Northbound	4910	0.59	0.75	0.91*	0.89
	Southbound	5350	0.55	0.64	0.72*	0.71
At the escarpment crossing	Northbound	5225	0.57	0.66	0.88*	0.91
	Southbound	5225	0.60	0.68	0.84*	0.94

* with Hwy. 407, could potentially improve the v/c by 0.1.

In order to address the v/c short-comings contained in the table, the recommended improvements were (extracted from Table 19, page 52 of the *Stantec* report):

Intermediate Growth Horizon

- additional lane of capacity east/west through Flamborough;
- additional lane on North Service Road east of King Road;

Ultimate Growth

- additional lane of north/south capacity across escarpment;
- additional lane on North Service Road between King Road and Waterdown Road;
- additional lane on King Road between North Service Road and Plains Road; and ramps to/from the east at Hwy. 403; and
- South Service Road between King Road and Waterdown Road (required for development access).

The 1999 Master EA recommendations for roadway improvements are indicated on **Exhibit 2.1** (reproduced from the 1999 report). The main additions to the network were:

- the "Red Route" which was an east west corridor immediately north of Parkside Drive extending between Highway 5 (west of Highway 6) and Dundas Street (west of Evans Sideroad); and
- the "Green Route" (extending between Dundas Street and the North Service Road) which was an improved connection between Dundas Street and the North Service Road generally following the King Road alignment.

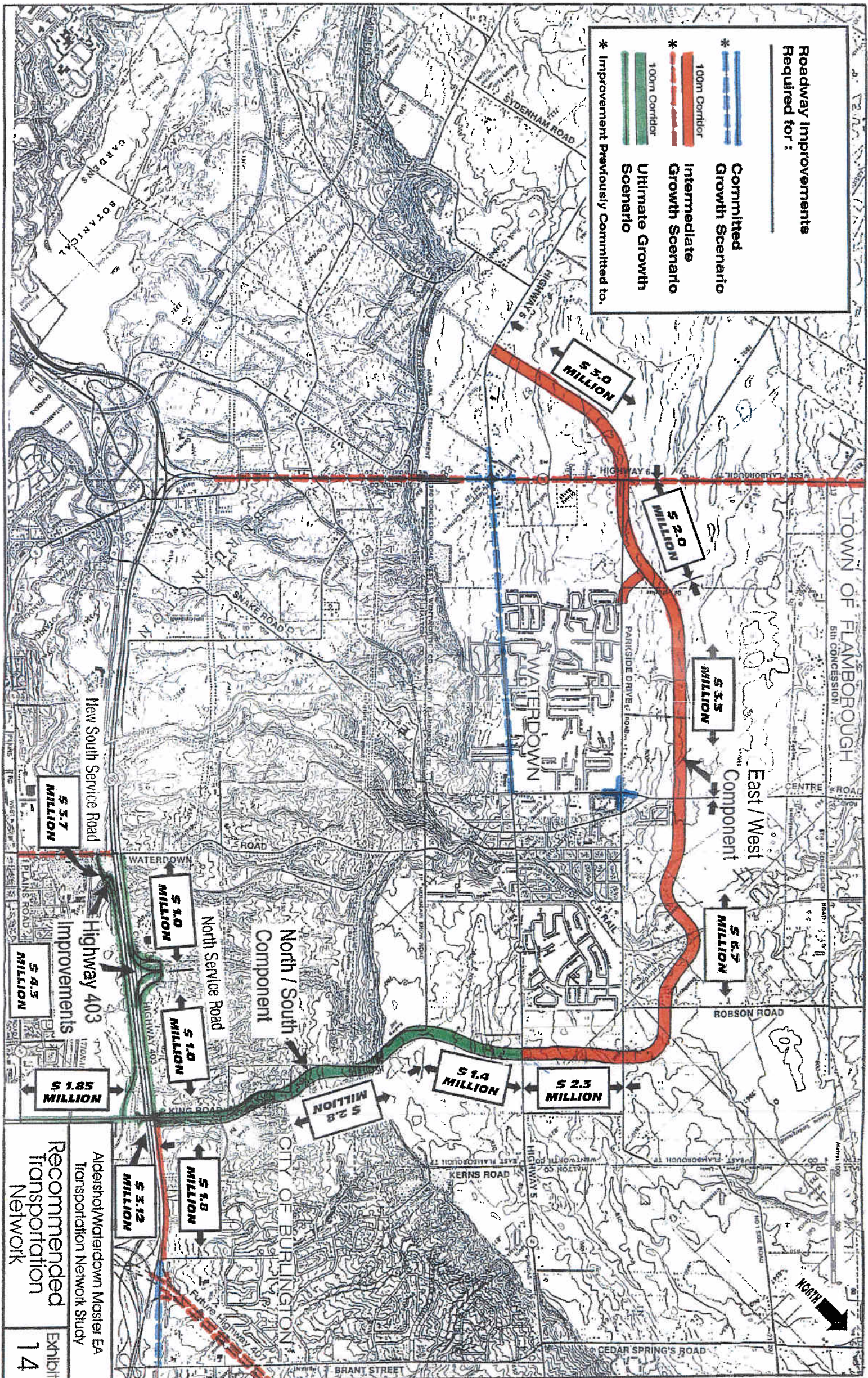


EXHIBIT 2.1 – RECOMMENDED TRANSPORTATION NETWORK
 (reproduced from Aldershot/Waterdown Master EA Transportation Network Study – September 1999)

Aldershot/Waterdown Master EA
 Transportation Network Study
 Recommended Transportation Network
 Exhibit 14

It should be noted that for some screenlines, traffic forecasts for the ultimate horizon year are lower than the intermediate year. Presumably, this is a result of modelling of the potential impacts of the opening of 407 ETR (assumed to be open only by the ultimate horizon year). The model forecasted a significant drop in traffic volumes at both the north-south and east-west screenlines (see shaded areas of above table) as a result of the 407 ETR west extension.

The 407 ETR has not relieved the east-west travel volumes since its opening in 2001; however, there has been a small reduction in north-south volumes (see Section 4.2).

In retrospect, the modelled impacts of the 407 ETR were probably over-stated in the 1999 report. For this reason, the ultimate road needs in the study area may well have been understated, particularly in the east west direction, east of Evans Road.

This review study will re-examine the needs as identified in the 1999 report.

3.0 DEMAND FORECASTING METHODOLOGY

The intention of this review was to investigate the needs analysis for future road capacity in the Waterdown/Aldershot area from a number of perspectives, including both regional impacts and effects of other road initiatives as well as determining the needs on individual links.

To address this array of issues requires the approach of using both a *strategic* high level modelling exercise and a more concentrated detailed local area model (*sub-area modelling*). The strategic modelling exercise will address questions on network expansion and other major network influences, particularly the potential impact of the proposed Niagara-GTA Corridor as planned by the Ministry of Transportation, Ontario, while the sub-area modelling will focus on the details of infrastructure requirements within the study area. A discussion of the modelling methodology is presented in Sections 3.2 and 3.3.

3.1 Hour of Analysis

The Strategic Model uses an AM Peak Hour for modelling purposes. This is because the AM Peak is generally more easily modelled with "home-to-work" trips heavily predominating at that time of day. In the PM peak hour, there are many other trip types taking place and it is not as easy to correlate trip making to the basic inputs of population and employment.

The assessment of current conditions (see Section 4.1) illustrates that the PM peak hour is significantly worse in terms of congestion than the AM peak hour for this study area. This is illustrated by a simple statistic that shows PM peak hour in-bound traffic volumes to the village are currently 29% higher than the outbound flows in the AM peak hour as shown in the following table:

	Current Outbound Traffic – AM	Current Inbound Traffic – PM
Parkside Dr. (east of Hwy. 6)	186	229
Dundas St. (east of Hwy. 6)	666	776
Dundas St./Regional Road 5 (west of Brant St.)	1503	1967
Mill St. (south of Dundas St.)	205	336
TOTAL TRAFFIC	2560	3308

It is also interesting to look at the difference in trip generation rates (using ITE rates) for the AM and PM peak hours. The study area total trip generation for Aldershot and Waterdown (see section 5.1.1 for further details) is summarized below:

AM Peak Hour		PM Peak Hour	
Inbound	Outbound	Inbound	Outbound
2970	4880	5671	4301
7850		9972	

This suggests a 27% greater trip generation in the PM peak hour than in the AM peak hour.

In order to determine infrastructure needs, the sub-area model focussed the analysis on the PM peak hour, while AM peak outputs from the strategic model were factored to the PM peak in order to maintain consistency in the analysis.

3.2 Sub-Area Modelling

The sub-area modelling was done by using current traffic turning movement counts as a base, factoring in background growth and then adding to the network the impact of the local development using a simple trip generation (using ITE rates), distribution (using 2001 TTS data) and (hand) assignment of trips. The critical intersections in the study area were analyzed for their capability of handling the resulting forecast traffic volumes using the SYNCHRO/SimTraffic traffic simulation package. Capacity deficiencies were identified and improvements tested for their ability to satisfy the capacity shortfall.

The sub-area modelling process is suitable for:

- short range time horizons only (less than 10 years);
- in situations where the strategic network is unlikely to change considerably; and
- analyzing the impacts and needs of individual links and intersections.

It is not a suitable technique for long range forecasting (greater than 10 years).

3.3 Strategic Modelling

The strategic modelling was done by adapting the City of Hamilton's current model. It has a gravity model based trip generation module and a capacity restraint assignment algorithm.

The results of the model are:

- suitable for identifying capacity conditions on a screenline basis only;
- not suitable for individual link (without significant refinement) or intersection analysis;
- appropriate for identifying impacts from external network improvements;
- appropriate for long range forecasting of impacts.

The main reason for utilizing a Strategic Model for this project was to examine the potential impacts of the Niagara-GTA Corridor and whether its implementation might negate the need for improvements to the arterial road network in the study area.

4.0 EXISTING CONDITIONS

4.1 Current Capacity Deficiencies

Recent turning movement counts at the main intersections in the study area are shown in **Exhibits 4.1** and **4.2** for AM and PM peak hours respectively. A review of both SYNCHRO intersection analysis and SimTraffic simulation results was carried out using these current traffic counts (including minor smoothing of data in places) and existing signal timing plans. The results show that while most intersections are operating well, there are certain specific movements that are experiencing delays and evidence that capacity may soon be (or already has been) reached.

Since the turning movement counts used for this examination of existing conditions were actually observed, in theory none of the movements should have a volume to capacity (v/c) ratio in excess of 1.0. That is to say, if 500 vehicles were observed making a certain movement, then the capacity of that movement cannot be less than 500 based on that particular signal timing. Some effort had to be made to calibrate SYNCHRO and SimTraffic to reflect this truth, as in certain cases the default analysis parameters showed the observed flows to be over capacity.

The table in **Exhibit 4.3** shows the worst existing individual intersection movements in the study area, for the AM and PM peak periods. The table shows all movements which exhibited a v/c ratio of greater than 0.80. As can be seen, PM peak hour conditions are more congested than the AM peak hour, with numerous movements near to, or at capacity.

4.2 Recent Growth

Between 1997 and 2002/03, background traffic volumes in the study area rose along Dundas Street (approximately 2% per year) but declined along the north-south escarpment crossings.

EXHIBIT 4.4 – CHANGES IN RECENT PEAK HOUR TRAFFIC VOLUMES

Inbound gateways into the Waterdown area:	1997 Count (PM Peak Hour)	2002/03 Count (PM Peak Hour)	Change
Centre Road SB (north of Parkside Drive)	530	621	91 (17%)
Dundas Street EB (east of Hwy. 6)	710	780	70 (10%)
Dundas Street/Reg. Road 5 WB (west of Brant Street)	1480	1608	128 (9%)
Kerns Road NB (south of Dundas Street/Reg. Road 5)	200	61	-139 (-70%)
Mill Street NB (south of Dundas Street) *	500	336	-164 (-33%)
TOTAL	3420	3406	-14 (-0%)

* Note: Mill Street gateway includes traffic from Waterdown Road and King Road

The overall change (0%) in gateway (inbound) crossings of the escarpment is negligible which would reflect the minimal new development that has taken place in Waterdown in the last 5 years. Traffic growth at the Brant Street/Regional Road 5 intersection and Dundas Street /

Highway 6 / Highway 5 intersections was 12% and 11% respectively over the same time period.

EXHIBIT 4.3 – CURRENT CRITICAL TURNING MOVEMENTS

Intersection	Movement	Demand volume	v/c	Average delay/veh (s)
AM Peak Hour				
Dundas St. at Mill St.	EB through/right	985 through 53 right	0.88	EBT 33.3 EBR 33.2
Dundas St. at Evans Road	SB left/right	339 left 26 right	0.83	SBL 28.0 SBR 22.5
Regional Road 5. at Brant St.	EB through	1214	0.92	38.8
Hwy. 6 at Parkside Dr.	SB left	144	0.83	55.4
PM Peak Hour				
Hwy. 6 at Hwy. 5 / Dundas St.	WB left	432	0.85	62.8
Hwy. 6 at Parkside Dr.	SB left	155	0.83	43.1
Dundas St. at Hamilton St.	EB left	149	0.93	24.9
Dundas St. at Main St.	WB through	1040	0.89	30.9
Dundas St. at Mill St. ¹	WB through	927	0.83	56.6
Hamilton St. at Parkside Dr.	NB left	89	0.85	39.8
Regional Road 5 at Brant St. ²	NB left	385	1.10	NBL 233.3
	WB left	492	1.21	WBL 335.2
	WB through	1562	0.94	WBT 56
North Service Rd. at Brant St.	EB right	435	0.85	EBR 14.6
	WB left	378	0.82	WBL 349.7
	NB left	538	0.93	NBL 108.0
	NB through	1376	1.03	NBT 101.7
Kerns Rd. at North Service Rd.	WB through	680	0.86	32.3
King Rd. at North Service Rd.	WB through	630	0.91	105.3
Waterdown Rd. at North Service Rd.	WB through/left	274 left	0.96	WBL 95.3
		349 through		WBT 98.9

N.B. Turning movements shown with a v/c over 1.0 are likely operating at greater saturation flow rates than assumed.

¹ There is significant recurring queuing westbound on Dundas St. in the PM peak where the 4-lane section ends approaching Mill St., and this meters demand making the intersection appear to function, when in reality there is a capacity deficiency on Dundas St.

² This intersection is in need of improvement by the addition of double left turn lanes (NBL, WBL). This need was also identified in the *Transportation Master Plan for Regional Road 5 (Dundas Street) and 25 Corridors*, undertaken by Halton Region in 1999.

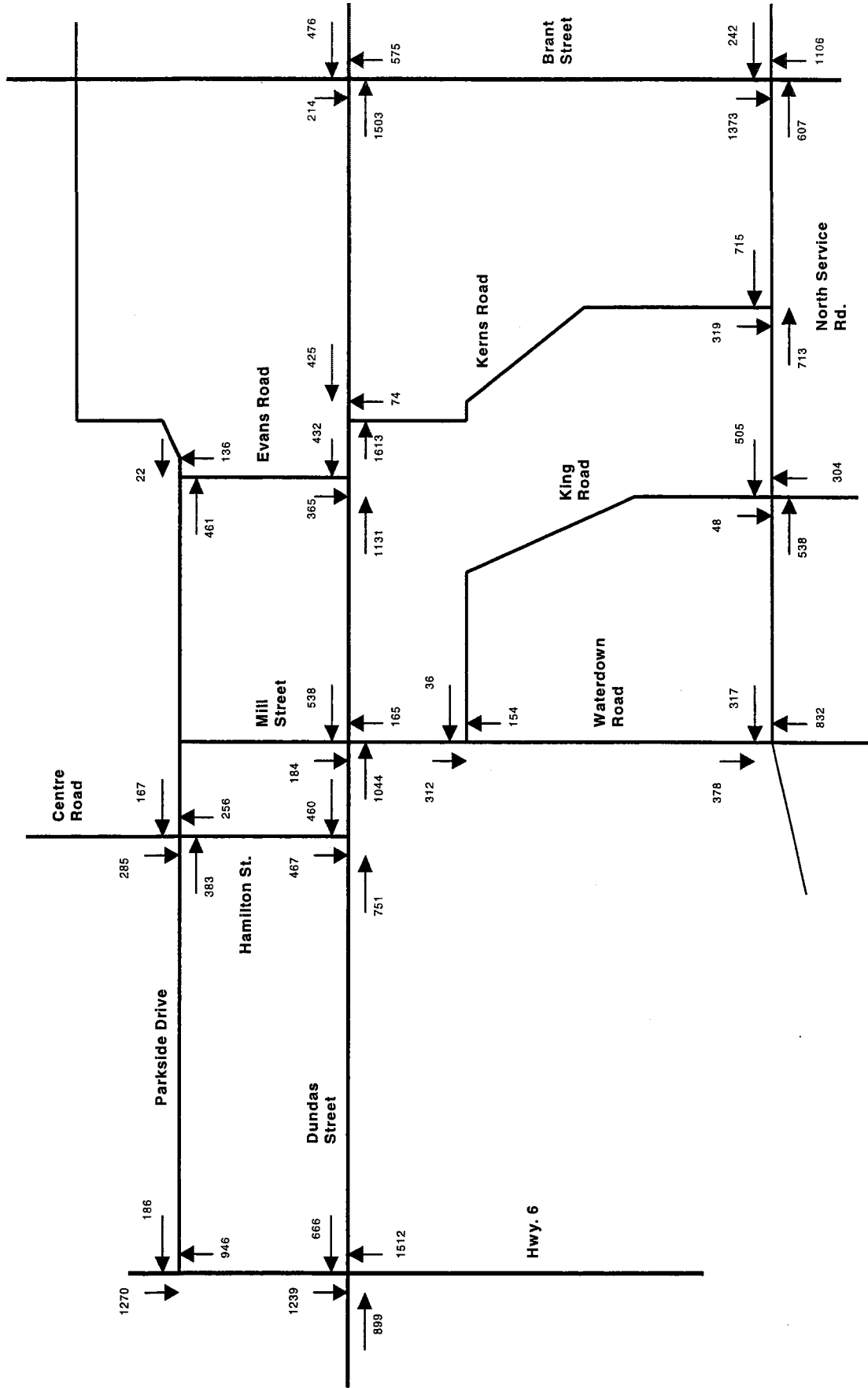


EXHIBIT 4.1 - AM PEAK HOUR TRAFFIC VOLUMES (2002/03)

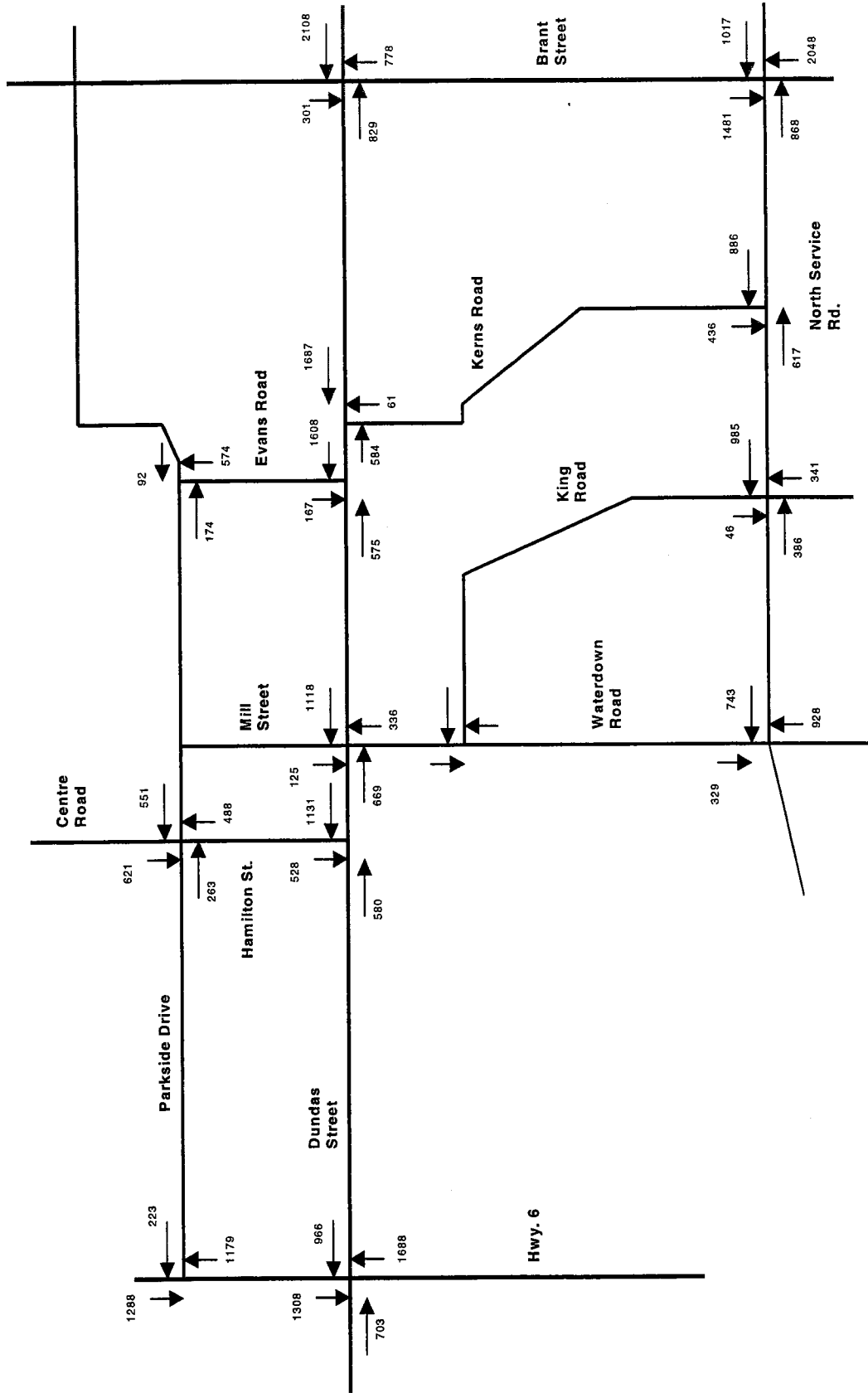


EXHIBIT 4.2 - PM PEAK HOUR TRAFFIC VOLUMES (2002/03)

5.0 SUB-AREA MODELLING

5.1 Sub-Area Model Development

5.1.1 Trip Generation

In order to estimate the new trips that will use the Waterdown area road network in the future, a list of land development projects was obtained, as shown in **Exhibit 5.1** below. See **Exhibit 5.2** for the referenced development areas.

EXHIBIT 5.1 – POPULATION & EMPLOYMENT FORECASTS

Residential Units Employment

ALDERSHOT & TYANDAGA

Sketch

1	Jannock Brick Plant	0	30
2	King's Forest Bus. Park	0	3400
3	Jannock/CNR lands	0	3500
4	Blue Circle lands	0	725
5	Waterdown Rd lands	0	600
6	Howard Rd lands	0	350
7	DeGrootte Project	215	0
8	Plains Rd lands	100	100
9	Emshih east of Costco	0	550
10	Amherst Drive	230	0
11	United Lands	100	0
12	Geofcott lands	0	400
13	Grindstone Owners	650	250
14	Garden Trails	200	0
15	Easterbrook lands	100	0
16	Bridgeview Office	0	100
17	Snake Rd Cemetery	0	0
18	Dundas Pleasantview	25	0
22	West Plains	50	0
23	Aldershot Plaza	500	0
24	RBG Expansion	0	100

subtotal 2170 10105

(5880 pop.¹)

¹ approx. growth from 1999 on

WATERDOWN

Sketch

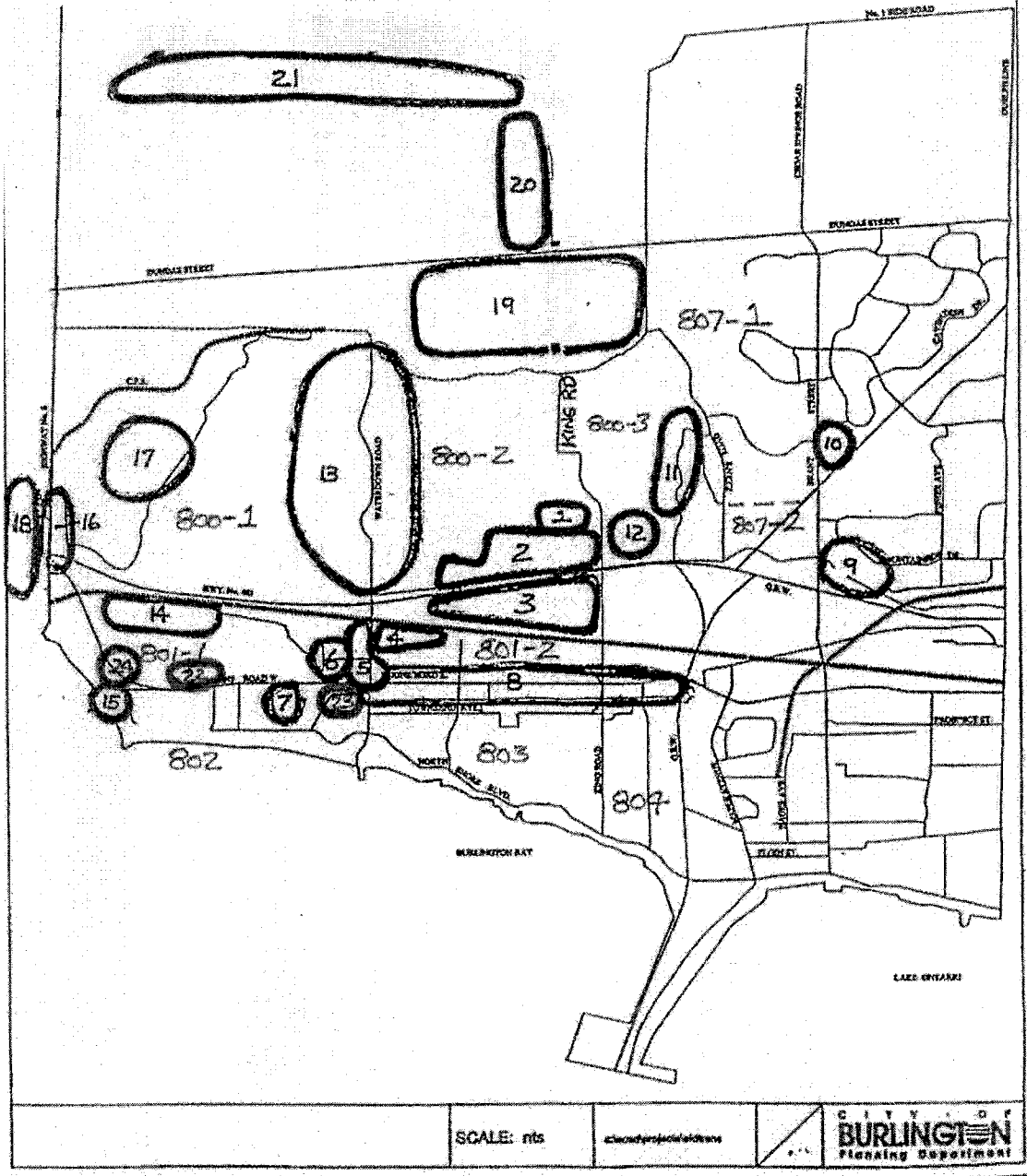
19	South of Dundas Street	3500	0
20	North of Dundas Street	1000	0
21	Parkside Drive Corridor	2000	0

subtotal 6500 0

(19500 pop)

EXHIBIT 1

EXPECTED NEW DEVELOPMENT WITHIN ALDERSHOT
 AND ADJOINING AREA



**EXHIBIT 5.2 - LOCATIONS OF EXPECTED NEW DEVELOPMENT
 IN WATERDOWN & ALDERSHOT**

These proposed development sites were sorted into the sub-area zone system used for this study, which involved putting from 1 to 8 developments into a single traffic zone depending on location. An exception was the Parkside Drive Corridor development which was split over two traffic zones due to its size.

Zones within Waterdown's OPA 28 were assumed to be completely developed by the 2008 horizon year, while those zones located in Aldershot and Tyandaga were scaled to reflect likely level of development completion by the year 2008, based on planning data received from the City of Burlington for 2011 and 2021.

For each planned land use type (residential or industrial), standard ITE Trip Generation rates were used for both the total generation, and the inbound/outbound split of traffic flow. The resulting trip generation and directional splits are shown in **Exhibit 5.3** below.

EXHIBIT 5.3 – TRIP GENERATION CALCULATIONS

		PM peak Trip Generation (p265, p92)				AM peak Trip Generation (p264, 91)			
		Residential		Employment		Residential		Employment	
		0.64	0.36	0.21	0.79	0.25	0.75	0.83	0.17
		in/out splits:		in/out		in/out		in/out	
		direction:		direction:		direction:		direction:	
		trips / unit or emp.:		trips / unit or emp.:		trips / unit or emp.:		trips / unit or emp.:	
		1.02		0.42		0.75		0.44	
ALDERSHOT & TYANDAGA									
Sketch #									
1	Jannock Brick Plant	0	0	1	2	0	0	3	1
2	King's Forest Bus. Park	0	0	71	268	0	0	295	61
3	Jannock/CNR lands	0	0	73	276	0	0	304	62
4	Blue Circle lands	0	0	38	143	0	0	157	32
5	Waterdown Rd lands	0	0	38	142	0	0	156	32
6	Howard Rd lands	0	0	22	83	0	0	91	19
7	DeGroote Project	119	67	0	0	34	102	0	0
8	Plains Rd lands	63	36	6	21	18	55	23	5
9	Emshih east of Costco	0	0	49	182	0	0	201	41
10	Amherst Drive	0	0	0	0	0	0	0	0
11	United Lands	65	37	0	0	19	56	0	0
12	Geofcott lands	0	0	29	108	0	0	119	24
13	Grindstone Owners	328	184	7	27	94	282	30	6
14	Garden Trails	131	73	0	0	38	113	0	0
15	Easterbrook lands	55	31	0	0	16	47	0	0
16	Bridgeview Office	0	0	9	33	0	0	37	7
17	Snake Rd Cemetary	0	0	0	0	0	0	0	0
18	Dundas Pleasantview	8	5	0	0	2	7	0	0
22	West Plains	33	18	0	0	9	28	0	0
23	Aldershot Plaza	276	155	0	0	79	238	0	0
24	RBG Expansion	0	0	6	24	0	0	26	5
Subtotals:		1078	606	349	1309	309	928	1442	295
		Total trips: 1684		Total trips: 1658		Total trips: 1237		Total trips: 1737	
		Total trips: 3342		Total trips: 2974					
WATERDOWN									
Sketch #									
19	South of Dundas Street	2285	1285	0	0	656	1969	0	0
20	North of Dundas Street	653	367	0	0	188	563	0	0
21	Parkside Drive Corridor	1306	734	0	0	375	1125	0	0
		4244	2386	0	0	1219	3657	0	0
Totals:		5322	2992	349	1309	1528	4585	1442	295
		Total trips: 9972		Total trips: 7850					

(page references are from ITE Trip Generation Manual, 6th Edition)

5.1.2 Trip Distribution

The trip distribution was done according to the 2001 Transportation Tomorrow Survey (TTS - version 1.0 database) results for the zones in the study area. External trips were aggregated based on distance from the study area - the further from the study area, the larger the aggregation. For example, only one external zone was necessary to represent all trips to and from Oakville and all points east, as all these trips would share the same access points to the sub-area study area (in this particular case being Regional Road 5 and the QEW).

Origin-Destination matrices were developed for AM and PM peak periods to include all the zones used in the sub-area model, and all the external aggregated zones. The new trips generated by the expected development activity for the AM and PM peak hours were then distributed according to the proportions in the OD matrix.

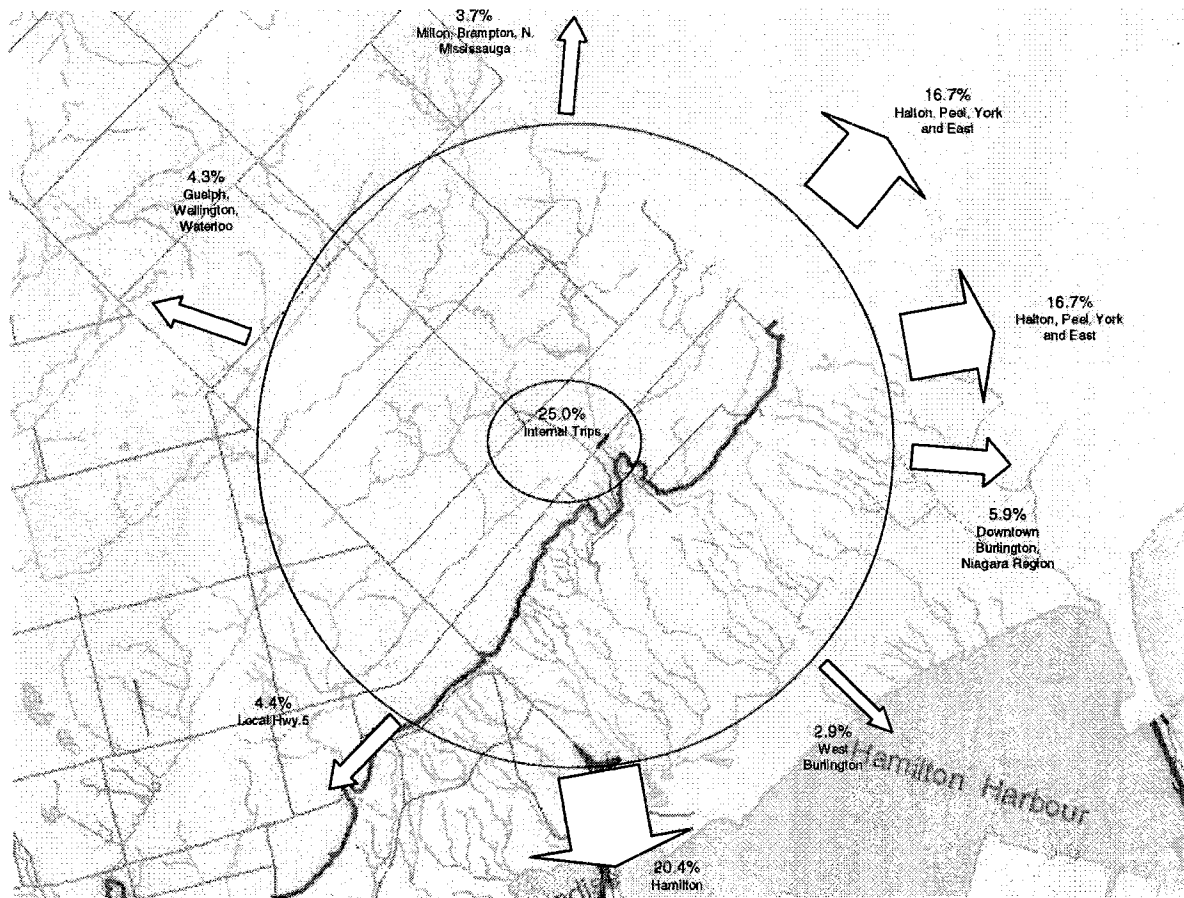


EXHIBIT 5.4 - AM PEAK OUTBOUND TRIP DISTRIBUTION (FROM 2001 TTS)

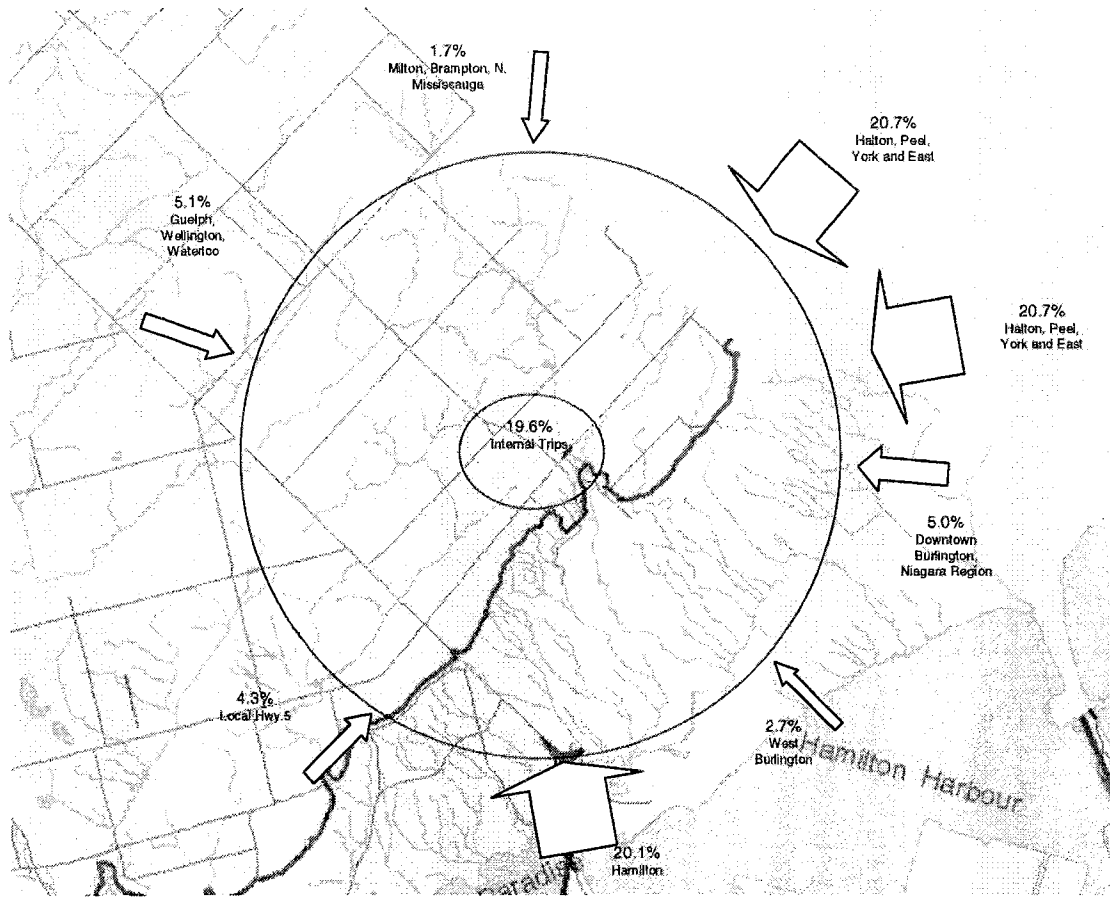


EXHIBIT 5.5 - PM PEAK INBOUND TRIP DISTRIBUTION (FROM 2001 TTS)

5.1.3 Trip Assignment

The trips were assigned to the network using from 1 to 3 paths for each OD pair, depending on the locations and network scenario, and hence the availability of likely route options. Any trips which would not use links within the sub-area were not assigned, e.g. trips from South Aldershot to downtown Burlington would not appear within the sub-area road system. The assignment took into account the access points for Hwy. 403, including the planned new interchange ramps at Waterdown Rd.

As part of this sub-area modelling exercise, the terms of reference called for a testing of the previously recommended transportation network contained in the 1999 Stantec report. The testing of this network (and variations) is presented in Appendix A.

5.1.4 Currently Planned Road Improvements

The following are improvements to Highway 6 planned by the MTO:

- Hwy. 6 widening to 5 lanes (3 NB / 2 SB) south of Highway 5 / Dundas St. – the detailed design is underway, construction is subject to funding in relation to other provincial priorities.
- Highway 5 / Dundas St. / Highway 6 interchange (Parclo A) EA was recently completed – detailed design and construction will depend on traffic volumes, property acquisition and funding in relation to other provincial priorities.

- Highway 6 (north of Highway 5 / Dundas St.) – a planning study is to be initiated to review the ultimate need and configuration of the highway.
- Highway 5 (west of Highway 6 - potential widening) – a Preliminary Design and Environmental Assessment Study is currently underway.

The existing over-capacity conditions at the Highway 6/Dundas Street/Highway 5 intersection will demand the grade-separation be made as soon as possible. The grade-separation was assumed to be in place by the time of the full-build out of OPA 28 and Aldershot, as was the Highway 403/Waterdown Road complete interchange (addition of ramps to and from the east).

5.1.5 General Implications of the Development Scenarios

The analysis of base conditions (see Section 4) reveals a current road network that is straining at the exit/entry points to Waterdown village, particularly at points along Dundas Street, i.e. Highway 6, Mill Street and Brant Street. These are the main escarpment crossing points for traffic to get into and out of the village. In examining the trip distribution of future trips (as discussed in Section 5.1.2), it is clear that the new residential development will need to use these same exit/entry points for commuting access to destinations in Burlington and beyond.

The addition of either 50% or 100% of OPA 28 and associated Aldershot development results in an extremely overloaded current network. The 50% OPA 28 development scenario (including a scaled Aldershot development) places the following additional traffic volumes on the key "gateway" roadway segments:

EXHIBIT 5.6 – ADDITIONAL GATEWAY PRESSURES DUE TO OPA 28 (50%)

	50% OPA 28 + Aldershot Development assigned to base network	
	Outbound – AM	Inbound – PM
Parkside Dr. (east of Hwy. 6)	250	420
Dundas St. (east of Hwy. 6)	450	270
Dundas St. / Regional Road 5 (west of Brant St.)	610	860*
Kerns Rd. (south of Dundas St. / Regional Road 5)	210	10*
Mill St. (south of Dundas St.)	220	480

* in reality, more traffic may use Kerns Road as Brant/Regional Road 5 would be extremely overloaded in this hypothetical scenario.

The addition of the complete OPA 28 development and scaled Aldershot development results in the following pressures in the PM peak.

EXHIBIT 5.7 – ADDITIONAL GATEWAY PRESSURES DUE TO OPA 28

	100% OPA 28 + Aldershot Development assigned to base network	
	Outbound - AM	Inbound – PM
Parkside Dr. (east of Hwy. 6)	490	840
Dundas St. (east of Hwy. 6)	870	540
Dundas St. / Regional Road 5 (west of Brant St.)	1160	1650*
Kerns Rd. (south of Dundas St.)	420	10*
Mill St. (south of Dundas St.)	360	890*



* in reality, more traffic may use Kerns Road as Brant/Regional Road 5 would be extremely overloaded in this hypothetical scenario.

Based on these assignments (unrealistic without significant improvements), without considering the small amounts of available capacity remaining, nominally:

- an additional high capacity east-west lane (equivalent to an arterial lane) is required to the west (Parkside + Dundas with new demands of $840 + 540 = 1380$),
- an additional high capacity east-west lane (equivalent to an arterial lane) is required to the east (Dundas new demands of 1650);
- and one new north-south lane is required to relieve impacts on Waterdown and Kerns with new demands of $890 + 10 = 900$).

These future requirements may be modified slightly when considering links that currently have some spare capacity (e.g. Waterdown Road/Mill Street) and roadways that will be improved (e.g. Highway 6/Dundas Street/Highway 5 interchange). The results are presented initially in this manner in order to provide a quick snapshot of the implications of the future development scenarios in terms of the major gateway requirements into and out of Waterdown village. This overview does not include other pressures that may also exist elsewhere in the network.

5.2 Future Conditions

A nominal horizon year and full build out of OPA 28 was considered to be 2008. The labelling of the horizon year is somewhat academic. It is meant to be a near/mid-term horizon suitable for the modelling technique being used - longer term horizons are not appropriate for this technique. Background traffic volumes along Dundas Street had grown by approximately 12% between 1997 and 2002/03, this same growth was applied to the existing through movement counts at intersections along Highway 6 and Dundas Street to get to a background growth scenario for the horizon year.

In analyzing this background growth scenario (i.e. no new development in Waterdown or Aldershot), the results show a worsening of traffic conditions at the three main bottlenecks (Dundas Street at Hwy. 6, Mill Street and Brant Street). While it appears that most of these background demand increases can be handled for the most part with signal timing adjustments (e.g. longer cycle lengths to improve capacity at the expense of delay), this assumes that current intersection improvement needs at the intersection of Regional Road 5 and Brant Street (double left turn WB to SB and NB to WB, and possible problems with WB through traffic in PM peak) have been undertaken.

For both the 50% and 100% build-out scenarios for development in Aldershot and Waterdown, the current road network becomes completely overloaded. As noted before, the entry/exit points to Waterdown are congested today and in these future scenarios of 50% or full development build-out, these gateways become extremely overloaded.

The main roadway links that are overloaded include:

- Dundas Street/Regional Road 5 (east of Waterdown village);
- Parkside Drive;
- Waterdown Road between Waterdown village and Highway 403; and
- North Service Road east of Waterdown Road.

Many of the links are overloaded to the point that the traffic assignment is theoretical only as current intersections could not process such volumes of traffic making intersection analysis redundant.

Based on the current network choices available, the main conclusion that can be drawn from these results is that both additional east-west capacity and north-south capacity is required for the study area around the Village of Waterdown and depending on what configuration this network would take further improvements would likely be required in Burlington to receive this additional traffic, e.g. North Service Road widening.

In order to test whether any of these network deficiencies are diminished by an aggressive pro-transit strategy, a scenario of high transit modal share is reviewed in Section 7.

As this report ultimately concludes, the next phase of this Master EA update has to analyze all potential north-south and east-west network improvement options in various combinations that could potentially cater to these very high traffic demands stemming from the future development of Waterdown and Aldershot.



6.0 STRATEGIC MODELLING

The purpose of the strategic modelling component of the study is to assess the implications of the various Niagara-GTA Corridor options on the need for arterial road improvements in the study area.

The Niagara-GTA Corridor is a proposed new facility that would stretch from the QEW, in the Niagara Falls/Fort Erie area, through the Niagara Peninsula to connect to the existing freeway network in the GTA. The need for the facility and a number of alternative alignments has been documented in prior studies. A number of potential alignments pass near to the study area, with some having greater impacts on the road network in the Waterdown/Aldershot Study Area than others. The location of the potential corridors being reviewed are shown in **Exhibit 6.1**.

The results of the analysis are presented in Appendix B of this report, a summary of the approach and findings are provided in the rest of this section.

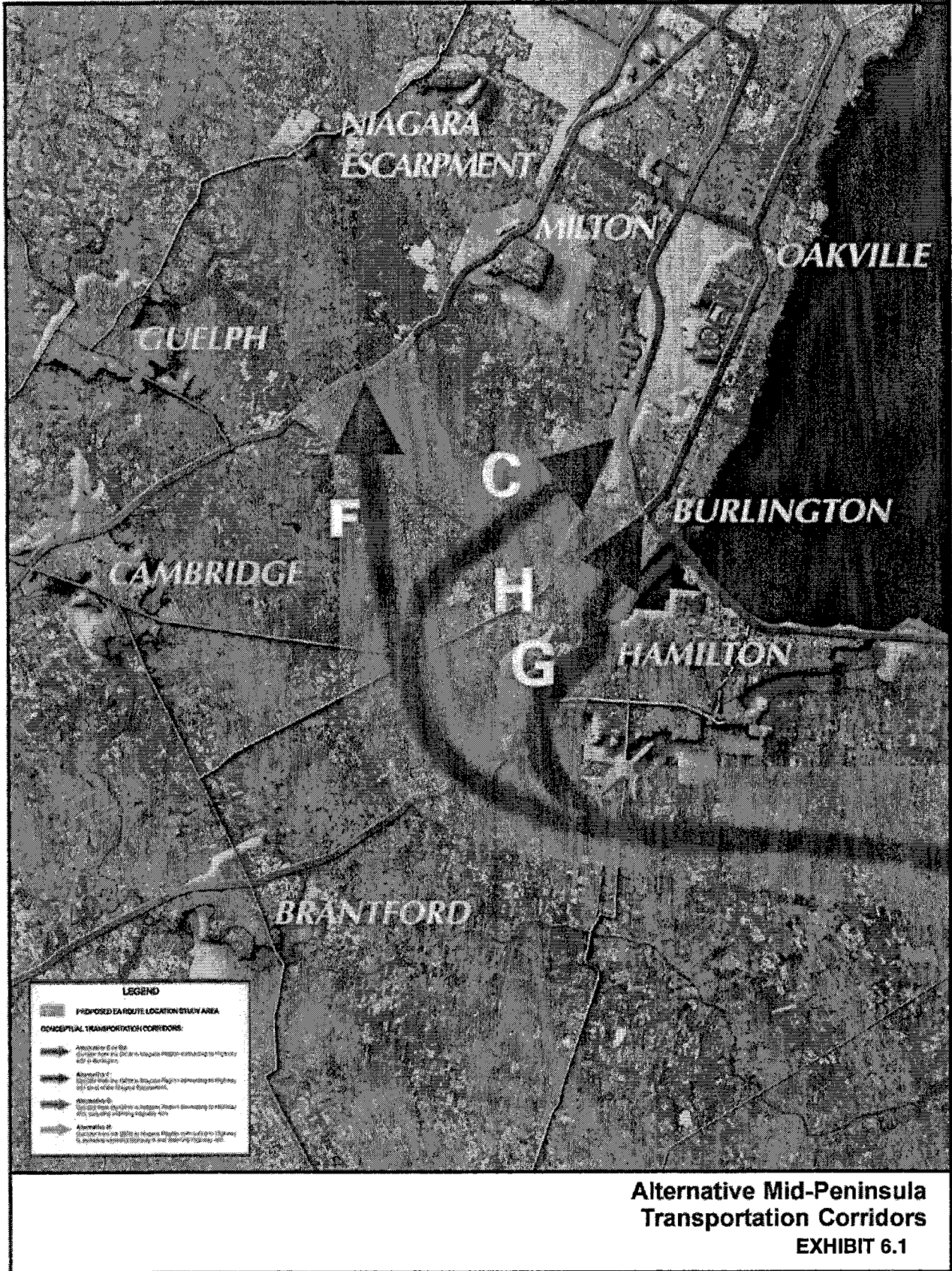
6.1 Methodology

Strategic forecasting was undertaken for this study using the City of Hamilton's EMME/2 demand forecasting tool. Assumptions built into the model forecasts related to municipal and study area land use (population and employment) and transportation infrastructure (road network) were confirmed and modified to reflect current expectations related to the development area for the base and 2021 horizon years. Model derived AM peak hour forecasts were converted to PM peak hour conditions to reflect the critical time period in the study area. A screenline analysis was then conducted to assess existing conditions, and to strategically assess any deficiencies in the future road networks.

6.2 Land Use

For the modelling work undertaken, population and employment forecasts from the City of Hamilton Official Plan were used along with latest figures from the City of Burlington. Updates to the model to represent the most recent land use expectations of the City were performed. These updates included land use assumptions for:

- ROPA 9 in Glanbrook;
- Stoney Creek Urban Boundary Expansion;
- Setting Sail (downtown Hamilton population and employment review); and
- 1999 Waterdown Master Plan.





6.3 Future Transportation Network Assumptions

For modelling purposes, the following long-term network additions were assumed to be implemented within the 20-year time horizon of the study (noting that all these initiatives are subject to funding availability and priorities, see in particular notes in section 5.1.4):

- QEW widening 6 to 8 lanes through Halton Region (for this analysis, assumed to be in place within a 10 to 20 year time period);
- Highway 403, widening from 6 to 8 lanes from Freeman Interchange to Lincoln Alexander Parkway, (assumed 15 to 20 year time period for this analysis);
- Highway 6 widening south of Dundas Street/Highway 5 (see section 5.1.4) - (for this analysis, assumed to be in place in the 5-10 year time period);
- Highway 6/Highway 5/Dundas Street grade separated interchange (see section 5.1.4) - (for this analysis, assumed to be in place in the 10 to 20 year time period);
- Waterdown Road widening to 4 lanes south of Highway 403 (for this analysis, assumed to be in place in the 5 to 10 year time period);
- Highway 403/Waterdown Road interchange improvements (for this analysis, assumed to be in place in the 5 to 10 year time period); and
- Red Hill Creek Expressway (for this analysis, assumed to be in place in the 5 to 10 year time period).

6.4 Alternative Testing

In order to test the implications of the Niagara-GTA Corridor, travel demand forecasts for the 2021 AM peak hour were developed for several Niagara-GTA Corridor network and land use scenarios. These scenarios were as follows:

- *2021 Base Network with OPA 28 development* - existing road network plus committed horizon year road infrastructure improvements.
- *2021 Improved Network* – Base network scenario with additional north-south and east-west capacity through Waterdown.
- *2021 Niagara-GTA Corridor Alternative C* – Improved network above with Niagara-GTA Corridor connection to Highway 407.
- *2021 Niagara-GTA Corridor Alternative F* – Improved network above with Niagara-GTA Corridor connection to Highway 401.
- *2021 Niagara-GTA Corridor Alternative G* – Improved network above with additional widening of Highway 403 between Niagara-GTA Corridor interchange and Freeman Interchange.
- *2021 Niagara-GTA Corridor Alternative H* – Improved network above with new Niagara-GTA Corridor east of Highway 6, a widened Highway 6 between new terminus and Highway 403, and a widened Highway 403 between Highway 6 and Freeman Interchange.

It should be noted that the Niagara-GTA Corridor alternatives were modelled without tolls in order to examine the maximum likely diversion from the local road system.

6.5 Conclusions of the Niagara-GTA Corridor Analysis

Based on the results of the strategic forecasting, the following conclusions were reached:



In the long term with the development of OPA 28, the screenlines and arterial road network in the Study Area will have exceeded their capacity.

The addition of new north-south and east-west capacity to the study area road network will provide relief to this congested condition, particularly for the arterial network. However significant screenline capacity deficiencies are forecast to remain, specifically east of King Road and north of Highway 403.

With respect to the Study Area screenlines, Niagara-GTA Corridor alternatives C, G, and H are equally effective at addressing deficiencies at a screenline level. However, even with these Niagara-GTA Corridor alternatives, deficiencies in the arterial roadway network are forecast east of King Road (1 arterial lane) and North of Highway 403 (1-2 arterial lanes).

The Niagara-GTA Corridor alternatives each provide new capacity for interregional trips commuting from Niagara and west Hamilton to the GTA. Alternatives C, G, and H provide east-west capacity into Burlington/Oakville that new east-west capacity within Waterdown cannot provide. Although in some cases, volume attracted to new east-west capacity decreases, it still maintains a local Waterdown role in distributing area development traffic to the adjacent arterial network and alleviates volume pressure on Dundas Street through Waterdown.

It is not anticipated that the Niagara-GTA Corridor will have an impact on the need for improvements to east-west roads in the study area. The two main needs identified are the addition of new east-west capacity in the north of Waterdown and the widening of Dundas Street/Regional Road 5, east of the connection of this new east-west capacity to Dundas Street, thereby providing continuous new east-west capacity from Hwy. 6 east to Brant Street.

Regardless of the Niagara-GTA Corridor alternative tested, there was little or no reduction in east-west travel on Dundas Street east of the developed area of Waterdown, which means that the Niagara-GTA Corridor and Dundas Street are catering to very different travel patterns.

The Niagara-GTA Corridor is a long-term plan to address long term interregional needs. In the absence of any other initiatives with respect to travel from Hamilton to the GTA, the need for the facility is in the 10 to 20 year time frame. Plans to address identified arterial road deficiencies as a result of proposed development in Waterdown and Aldershot will not be effected by the Niagara-GTA Corridor, regardless of the alignment chosen.

7.0 TRANSIT CONSIDERATIONS

As **Exhibits 5.4** and **5.5** illustrate, the trip making patterns of Waterdown and Aldershot residents (current and future) will be highly dispersed throughout the GTA and Hamilton making it difficult to attract significant transit ridership. Secondly, the current life-style choice for most residents moving into the Waterdown/Aldershot area (as with most '905' growth areas on the fringe of the urban area) is essentially oriented towards owning at least two cars per family and commuting to work by car. Currently the transit modal share of Waterdown residents is zero as there is no transit service available (other than yellow school buses). While many residents use Aldershot GO Station to access the Lakeshore GO Train to commute to Toronto, all rely on an auto to access the GO Station.

The most successful transit service in the general area is the Lakeshore GO Train service, which attracts a high modal share because of the fast service and highly concentrated downtown Toronto destination that it serves. As this service expands in the future, the downtown Toronto market will continue to be well served. Other destinations to the east or west are highly scattered, with the main potentials being Downtown Hamilton to the west and Mississauga to the east.

Given the high availability of cars, the best potential for future transit services in the study area will be from additional, fast, inter-regional transit services to select markets, while local transit service will serve only residents who happen to be without a car (essentially a social service).

To date, a number of attempts have been to provide transit service in the Waterdown area. A GO Rail bus connector was provided along Waterdown Road for some time by Hamilton Street Railway, but was discontinued because of inadequate ridership. There has also been consideration of a community bus (likely a van or small bus) in order to serve residents without the availability of a car.

By the time OPA 28 is developed, the Village of Waterdown will justify more of a regular transit service. A reinstatement of the GO Rail feeder will be the most likely first fixed-route service and possibly an extension into Hamilton as well as connections to the Burlington Transit system at the GO Station.

Halton Region recently completed a study entitled "Making Connections", dated October 2002. This study proposed an aggressive deployment of higher order transit along various corridors in the Region. Of relevance to the Waterdown/Aldershot area is the recommendation of a *Mid-Halton Corridor* which consists of a near term action plan to

"introduce minimum inter-regional transit service levels on Dundas Street through Burlington and Oakville along with required transit support elements, and connect to the Mississauga City Centre".

The study also recommended a bus turn loop to be introduced at Dundas Street/Regional Road 5 and Brant Street. This would indicate the service is only envisaged to go as far west as Brant Street. In order to slow down the growth of traffic out of Waterdown, it is logical that some portion of such an inter-regional transit services would be extended into the village and possibly terminating at a park and ride lot to encourage a modal switch to transit for commuters headed to the Oakville and Mississauga areas. The City of Hamilton would have to discuss with the Region of Halton the potential for this service extension should it proceed.

A recommended longer term strategy would involve the use of Bus Rapid Transit (potential separate right of way) along the 407 ETR corridor.

In the future, a transit modal share in the region of 5% may be possible should a reasonable service be provided.

Travel demand measures such as car/van pooling and rideshare matching are part of ongoing policy initiatives in the GTA currently; however, experience has shown in other jurisdictions that ridesharing rarely captures above a few percent of the travel marketplace. In many parts of the USA, after years of encouragement for ridesharing, vehicle occupancy has generally gone down mainly as a result of increasing car ownership rates. Therefore, it cannot be imagined that travel demand management measures will have a significant impact in the foreseeable future.

Impacts on Road Needs

Should the bus services be introduced as discussed above; i.e. bus service to the Aldershot GO Station, extension of service to Hamilton, an internal shuttle service within Waterdown (and possibly Aldershot) and an inter-regional service existing between Waterdown and Mississauga, then a transit modal share in the region of 5% to 10% may be possible. This would include a transit modal share in the range of 30% to the main markets (e.g. Mississauga, North Oakville and Downtown Hamilton) which is quite ambitious but may be possible if the inter-regional service is high quality. A 25% transit modal share is not achievable for the foreseeable future and likely not before all the urban expansion area is developed, and so the more plausible lower figures should be used in evaluating impacts on road needs.

A deduction of approximately 5% to 10% in the traffic forecasts is therefore possible. Unfortunately, this will not reduce the future road network needs identified earlier in the previous section of this report as forecast demands are much higher than the existing road system capacity (which is in fact near to capacity today). A reduction of 5% to 10% in traffic volumes may make the level of congestion more acceptable.

Further into the future, if aggressive transit service (e.g. a bus rapid transit service across Regional Road 5 from Burlington) is introduced and a 25% transit modal share is achieved in Waterdown, it should be noted that the additional lanes that would be required in the short term will still be needed to facilitate the higher quality transit service. A dedicated bus-only or HOV lane would be used if a transit advantage through priority measures is to be pursued to increase transit speeds and hence increase ridership.

Exhibit 7.1 below, is the previous Exhibit 5.8 reproduced with allowance for a greater transit modal share, under mid-term and long-term transit service conditions.

**EXHIBIT 7.1 – ADDITIONAL GATEWAY PRESSURES DUE TO OPA 28
(reduced by 10% to allow for greater transit usage in the future)**

	100% OPA 28 + Aldershot Development assigned to base network	
	Outbound - AM	Inbound – PM
Parkside Dr. (east of Hwy. 6)	440	760
Dundas St. (east of Hwy. 6)	780	490
Dundas St. /Regional Road 5 (west of Brant St.)	1040	1490*
Kerns Rd. (south of Dundas St. / Regional Road 5)	380	10*
Mill St. (south of Dundas St.)	320	800*

(reduced by 25% to allow for greater transit usage in the long term future)

	100% OPA 28 + Aldershot Development assigned to base network	
	Outbound - AM	Inbound – PM
Parkside Dr. (east of Hwy. 6)	370	630
Dundas St. (east of Hwy. 6)	650	410
Dundas St. /Regional Road 5 (west of Brant St.)	870	1240*
Kerns Rd. (south of Dundas St. / Regional Road 5)	320	10*
Mill St. (south of Dundas St.)	270	670*

* in reality, more traffic may use Kerns Road as Brant/Regional Road 5 would be extremely overloaded in this situation.

These lower volumes still clearly indicate the demand for additional network capacity on top of a currently congested road system at the existing gateways into the village.

8.0 REVIEW OF ENVIRONMENTAL CONSTRAINTS

This section of the report documents a review of the environmental and consultation aspects of the 1999 Master EA report for Waterdown/Aldershot in order to ascertain the continuing validity of the report. It was also done with a view to assessing how much of the report would require updating.

8.1 *Government Agency and Utility Company Responses*

The external consultation process involved contacting stakeholders such as potentially affected utilities and municipal services, and agencies that typically fulfil provincial Government Review Team functions. A total of thirty-eight (38) agencies were provided with notice of the study commencement and requested to provide an indication of any updated information with respect to policy developments or concerns over potential impacts to existing or proposed services or plant.

The following ten (10) agencies responded:

- Conservation Halton
- Enbridge Pipelines Inc.
- Hamilton Conservation Authority
- Hamilton-Wentworth District Catholic School Board
- Hamilton Utilities Commission (Hamilton Hydro)
- Imperial Oil
- Ministry of Agriculture and Food
- Ministry of Culture
- Ministry of Transportation
- Niagara Escarpment Commission

No new major issues or concerns emerged from this process. However, there are several updates on past concerns that warrant consideration. Highlights include:

- identification of the Parkside Drive Woodlot as a Candidate Environmentally Significant Area (ESA); upgrade from woodlot status (Hamilton Conservation Authority). It was noted that the designation is pending, and will be addressed further following a review by consultants retained by affected property owners in the area;
- construction of the Guardian Angels Catholic Elementary School 1 km north of Parkside Drive that has conditions of approval attached to it that could be affected by the preferred alternative (Hamilton-Wentworth District CSB); and
- concern over operational impacts to Highway 403 associated with the proposed Highway 403 ramp connections in light of the currently proposed Highway 403 interchange at Waterdown Road in the City of Burlington study (MTO).

The table in **Appendix C** summarizes the comments received from agency representatives and additional details are provided in Sections 8.2, 8.3 and 8.4.

EXHIBIT 8.1 ENVIRONMENTAL CONSTRAINT MAP

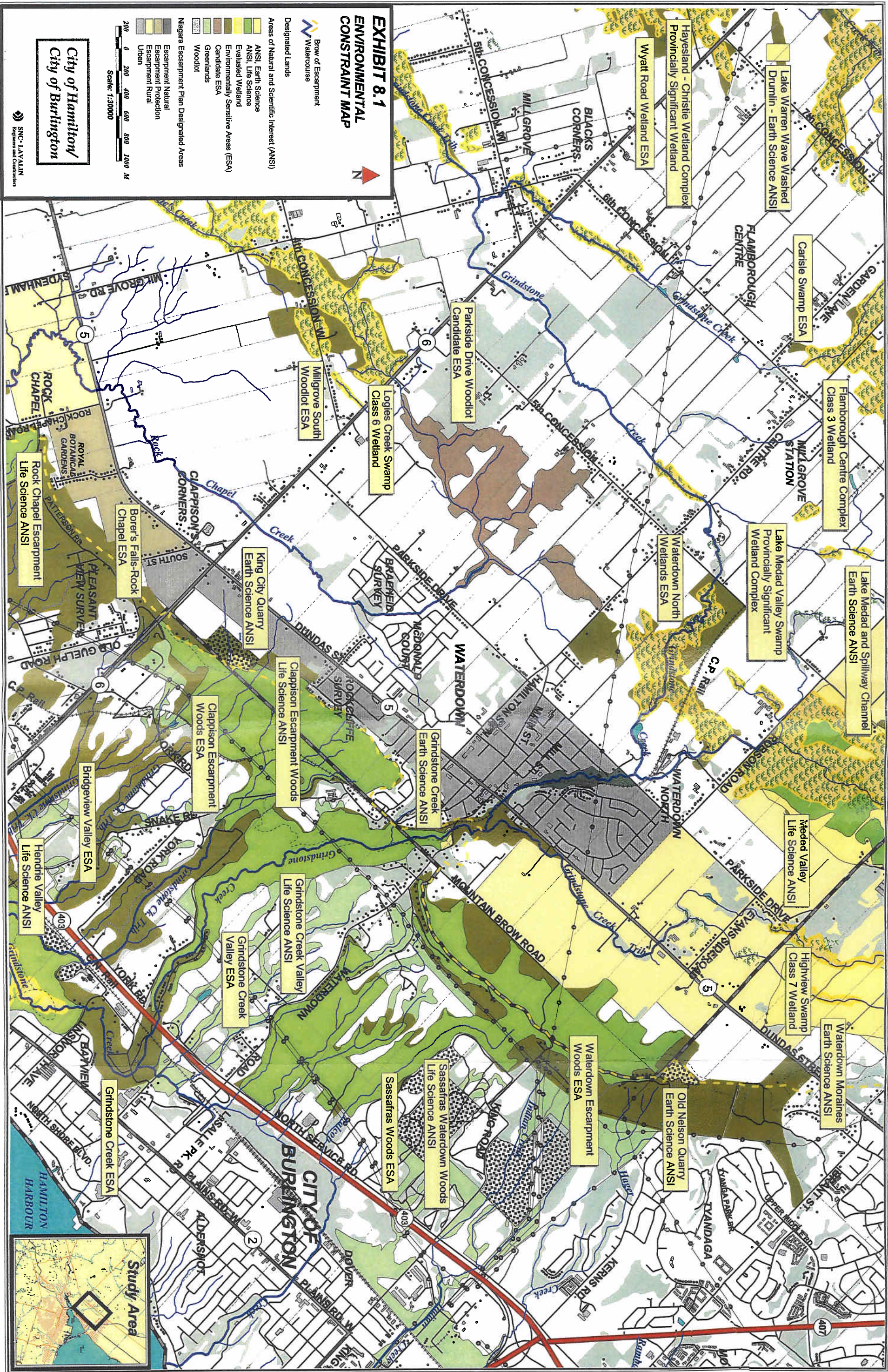
Brow of Escarpment
Watercourse

- Designated Lands
- ANSI, Earth Science
 - ANSI, Life Science
 - Evaluated Wetland
 - Environmentally Sensitive Areas (ESA)
 - Candidate ESA
 - Greenlands
 - Woodlot
- Niagara Escarpment Plan Designated Areas
- Escarpment Natural
 - Escarpment Protection
 - Escarpment Rural
 - Urban
- Areas of Natural and Scientific Interest (ANSI)



City of Hamilton
City of Burlington

SNC-LAVALIN
Engineers and Constructors



8.2 Natural Environment

8.2.1 East-West Segment

The City of Hamilton's Natural Areas Inventory (2002) was used to update the natural constraint mapping for the east-west segment of the preferred route in the 1999 Master EA report. The update is reflected on **Exhibit 8.1**. As indicated above, the only major modification to the 1999 scenario is the identification of the Parkside Drive Woodlot Candidate ESA (FLAM 128), upgraded from the previously identified woodlot sensitivity. The 94 ha woodlot comprises seven distinct vegetation communities along the headwater of Borer's Creek. The site is important because of the diversity of its constituent communities, including upland mixed forest, a conifer plantation, deciduous swamp, and meadow marsh. In addition, the woodlot complex contains a small amount of interior forest habitat, a resource that is becoming an increasingly important consideration to conservation authorities, MNR and Environment Canada in impact assessments. These agencies are moving toward an approach wherein proponents will be required to provide "compensation" for displaced interior forest habitat (this occurred on the 407 ETR West Extension as a result of Environment Canada's involvement in the screening under the *Canadian Environmental Assessment Act*). The Natural Areas Inventory also concludes that the site has potential for restoration (fill in jagged edges) to increase the interior forest area and enhance linkages to adjacent habitat. The site also exhibits a high water table, indicating that it is a significant groundwater recharge area.

This Candidate ESA meets ESA criteria (significant ecological function; significant hydrological function) and Significant Site criteria (remnant natural area in an intensively urban and agricultural landscape. Further details follow the table in **Appendix C**.

The proposed east-west segment of the preferred route (1999 Master EA) would sever the most southerly finger of the Candidate ESA, including Black's Pond and a reach of Borer's Creek. If full ESA designation is enacted, the proposed route would be in contravention of City Official Plan policy.

Further in regard to the impacts at this location, significant concerns remain with respect to the feasibility of implementing effective stormwater management measures for the proposed roadway and the adjacent North Waterdown development that will not adversely affect Black's Pond and that are within the hydrologic/hydraulic capacity of the Borer's Creek system (refer to comments in the **Appendix C** table from the Hamilton Conservation Authority in this regard).

The east-west segment of the preferred route in the vicinity of the Waterdown North Wetland ESA would appear to be within the 120 m distance requiring an Environmental Impact Statement. Agency comments to date suggest that there may be enough sensitivity to necessitate southerly relocation of the alignment at this location. Potential impacts to this Provincially Significant Wetland may be extended if the crossing of the St. Lawrence & Hudson Rail line requires grade separation at some point in the future, which would expand the road/rail intersection footprint.

8.2.2 North-South Segment

Information on the potential natural environmental sensitivities affected by the north-south segment of the preferred route (1999 Master EA) was updated through consultation with the Niagara Escarpment Commission, Conservation Halton and the City of Burlington. No new sensitivities were identified, but existing sensitivities warrant more emphasis.

The proposed new crossing of Grindstone Creek Tributary south of Dundas Street is a significant concern requiring a high level of protection, given the cool water/warm water fisheries sensitivities. This concern is magnified in light of the potential cumulative effects of the proposed roadway and East Waterdown developments.

Although in the 1999 Master EA Study, the King Road corridor segment had presumably been selected on the basis of minimizing natural environmental impacts, the proposed geometric improvements still have the potential to create impacts to the Escarpment face and the Waterdown Woods ESA. In conducting this review, the NEC agreed that there was a capacity deficiency in the north-south transportation network but not necessarily in the vicinity of King Road. In order to address this concern, it was agreed that the next phase of this study (Phase II of the Master EA process) would consider all reasonable alternatives to address the capacity deficiencies in the transportation network as a result of the development of OPA 28 lands.

8.3 Social Environment

Socio-economic constraints and opportunities have not changed significantly since 1999. The lone exception appears to be the construction of the Guardian Angels Catholic Elementary School on the west side of Centre Road approximately 1 km of north of Parkside Drive. The Hamilton-Wentworth District Catholic School Board has expressed a desire to have the east-west segment of the preferred route situated north of the new school. This concern stems from the apprehension that the recommended route in the 1999 report, although it would not be formally established or designated as a bypass, would serve to define the urban envelope for Waterdown, thus depriving the school of municipal water and sewer services. There was also some suggestion by the Board that the new roadway would create a barrier to the school's students who live in Waterdown and use the sidewalk on the west side of Centre Road, which was built specifically to serve the school.

The justification of other potential social impacts that should be considered in combination with the re-examination of the project's need are proximity effects to homes on the west side of Robson Road and the north side of Northlawn Avenue.

8.4 Environmental Assessment Process

The intent of the Master Plan process within the context of the MEA *Class Environmental Assessment* is that, as a minimum, the elements of Phase 1 (Problem or Opportunity) and Phase 2 (Alternative Solutions) for a group of related projects should be addressed in a comprehensive manner. The Master Plan would then provide the need and justification, and serve as a long range framework, for planning the subsequent individual projects. In particular, the Master Plan should provide an understanding of the combined impacts of infrastructure planning alternatives. Having fulfilled Phase 1 and Phase 2 requirements, the Master Plan would then be used in support of further consultation and documentation work on Schedule B projects, and Phase 3 and Phase 4 work on Schedule C projects.

A key component of the Master Plan is consultation with potentially affected public and government agency stakeholders throughout the planning process. Such consultation was conducted during the 1999 study. However, the current investigations suggest the following with respect to government agency input:

- 1) There are some comments and concerns that were not fully addressed or formally responded to, particularly those from the NEC, Conservation Halton and the Hamilton Conservation Authority;
- 2) Some environmental sensitivities have not been addressed in combination with the major proposed land use developments in Waterdown; and
- 3) The significance of some environmental sensitivities has evolved to the point where the study recommendations cannot be fully justified.

Based on the above information it is concluded that there are outstanding issues in the 1999 Master Plan process that should be addressed to provide sufficient justification for the road network proposals, prior to moving forward to the identification, planning, design and implementation of individual projects within the overall framework. This requirement would apply whether the future work is conducted as Schedule B and Schedule C undertakings using the Class EA process, if they are outside designated development holding areas, or using the Secondary Planning process under the *Planning Act*, if they are within designated development areas. In short, this means that Phase II of the 1999 Master Plan process has to be entirely re-done. Phase I of the 1999 process has been updated in this report and has confirmed and refined the conclusions relating to network needs.

9.0 SUMMARY

9.1 Results of Needs Analysis Update

The main gateways into and out of the Village of Waterdown are currently close to or at capacity in the peak periods (particularly PM peak). A significant amount of development is planned for the Waterdown expanded urban boundary area (OPA 28) as well as the adjacent Aldershot area of Burlington. The location of the Waterdown expansion in relation to the Niagara Escarpment and the main trip destinations to the south, west and east results in most traffic having to make an escarpment crossing. This will impact further on these existing congested gateways into/out of Waterdown.

The assumed highway improvements (Highway 6 widening, Dundas Street / Highway 6 / Highway 5 grade-separation, Highway 403 widening and Highway 403/Waterdown Road full interchange) will add important capacity additions to the area network in the long term.

Consideration will be given in the next phase to improved transit connections to the Greater Toronto Area, Hamilton, Burlington and the Aldershot Industrial areas from the development area. Other travel demand management techniques such as car pooling and the provision of high occupancy vehicle lanes will also be considered.

After considering existing conditions, future demands as well as committed roadway and potential transit improvements, the following technical conclusions have been developed based on this update of the Needs Analysis for the Aldershot/Waterdown area:

- the need for additional E-W network capacity has been confirmed;
- the need for additional N-S network capacity has been confirmed;
- the need to widen the North Service Road in Burlington has been confirmed;
- regardless of option considered to date, the Niagara-GTA Corridor while changing general travel patterns in the area will not impact the need for additional network capacity as the Niagara-GTA Corridor will serve a different function to the local network needs identified for Waterdown and Aldershot.

Not included in the 1999 Master EA Study, but identified in this review, is the need for additional east-west network capacity east of the Village of Waterdown. It is thought that this need was not identified in 1999 due to the fact that the impact of the (then) unopened 407 ETR was over-estimated in the modelling work undertaken at the time.

A key component of the Master Plan is consultation with potentially affected public and government agency stakeholders throughout the planning process. Such consultation was conducted during the 1999 study. However, this review of the 1999 Master EA has concluded:

- there are some comments and concerns that were not fully addressed or formally responded to, particularly those from the NEC, Conservation Halton and the Hamilton Conservation Authority;
- some environmental sensitivities have not been addressed in combination with the major proposed land use developments in Waterdown; and



- the significance of some environmental sensitivities has evolved to the point where the study recommendations cannot be fully justified.

Therefore, it is concluded that these findings constitute outstanding issues in the 1999 Master Plan process that should be addressed in a revisiting of the Phase II of the Master EA process in order to provide sufficient justification for the transportation network proposals, prior to moving forward to the identification, planning, design and implementation of individual projects within the overall framework.

9.2 Public Consultation

On June 24th 2004, a public open house was held in the atrium of the Waterdown High School between the hours of 4 pm and 8 PM. A number of presentation boards were available to present the background of the project, information on OPA 28, the current status of the Master EA, the conclusions of this report, the next steps in the process, etc.

A summary of the comment sheets received from the public at this meeting is tabulated in Exhibit 9.1. In general, comments chiefly concerned potential solutions that would be examined in the next phase of the study and the potential impacts of traffic growth in the area.

Responses were sent to those whose comment sheet contained a question or request.

9.3 Conclusions In this review, the Phase 1 (Needs Analysis) of the 1999 Master EA for Aldershot/Waterdown has been updated resulting in a refinement in the identification of future transportation network needs.

The Phase 2 component of the 1999 Master EA did not respond to comments from some of the main stakeholders. In this review it was also found that some environmental constraints have changed since 1999. As the 1999 Master EA report was not adopted by either the (then) Flamborough or Burlington Councils, the study has no status under the EA Act.

It is therefore recommended that Phase 2 of the Master EA process proceed in order to establish the location of the additional network capacity needs identified in this study. The study area for examining the location of these routes should be sufficient to consider all reasonable options.

In summary the main conclusions of this study are:

1. The need for additional east-west capacity in the overall transportation network in the Waterdown North and Waterdown/East/Aldershot/Burlington area, due to the development of OPA 28 lands has been confirmed.
2. The need for additional north-south capacity in the overall transportation network in the Waterdown/Aldershot/Burlington area, due to development of OPA 28 lands, has been confirmed.
3. All options to provide additional east-west and north-south capacity in the overall transportation network, to accommodate the additional demands due to the development of OPA 28 lands, need to be considered in the next phase of the Aldershot/Waterdown Transportation Master Plan Study Update (Municipal Class EA process – June 2000).



**EXHIBIT 9.1 – SUMMARY OF COMMENTS RECEIVED FROM PUBLIC OPEN HOUSE HELD
ON JUNE 24, 2004**

#	ATTENDEE (all Waterdown addresses, unless stated)	COMMENT	RESPONSE FROM STAFF (If applicable)	WISHES TO BE ON MAILING LIST
1	Dwyer, Kerns Road	Was not aware of Phase 1. Too much traffic on Kerns Rd. already Requests a newsletter be sent out to all resident potentially affected	Letter stating newsletter may be used in Phase 2.	Yes
2	Cornish, Flamborough Review Newspaper	Requests inclusion on mailing list	None	Yes
3	Stevenson, Dundas Street	Downtown Waterdown needs to be saved. Too many trucks on Dundas Street, needs a by-pass as discussed 20 years ago. Pedestrian environment important.	None	Yes
4	Reynolds, Northlawn Ave.	No comments	None	Yes
5	Butler, Plains Road East	No comments	None	Yes
6	Roberts, Clearview Ave, Burlington	Preserve natural environment of Waterdown Road. Mass transit linking Burlington and Waterdown should be considered. Develop industrial near to new homes to reduce commute distance.	None	Yes
7	Sharrod, Hwy. 5 West	Congestion in village is bad. Solution further north and west is better.	None	Yes
8	Vanderkruk, Dundas St. E.	Could Parkside Dr. become a major artery?	None	Yes
9	Stoddart, Forest Glen Ave., Burlington	Phase 2 should look at increased GO Transit service. Wants to maintain rural Waterdown Road and Aldershot as green land.	None	Yes
10	Elliot, Kerns Road	Concerned about the potential increased use of Kerns Road. First time heard of project, concerned of	None	Yes



EXHIBIT 9.1 – SUMMARY OF COMMENTS RECEIVED FROM PUBLIC OPEN HOUSE HELD ON JUNE 24, 2004

#	ATTENDEE (all Waterdown addresses, unless stated)	COMMENT	RESPONSE FROM STAFF (If applicable)	WISHES TO BE ON MAILING LIST
		minimal consultation. King Rd./Waterdown Road should be used as main NS access points.		
11	Wright, Stratheden Dr. Burlington	Are you planning for Mid Provincial Highway to get by Waterdown Road	Response explaining the difference between this project and MTO initiative.	Yes
12	Lawrence, RR#1, Waterdown	New EW road should be between 5 th and 6 th Concessions, fewer environmental constraints. More development lands created. Please extend study area boundary to 6 th Concession.	Response saying Phase 2 will start with a blank sheet and potentially as far as 6 th Concession.	Yes
13	Stevenson, RR#1, Waterdown	Concerned decision has already been made. Would like to actively participate in future.	Response inviting his contribution	Yes
14	Boonstra, Waterdown	Traffic on Dundas Street bad, by-pass is needed. EB Access to H403 from Waterdown also needed. Irresponsible to approve development without having plan in place first.	None	Yes
15	Martell, Scott Street, Waterdown	Any new road will cause disastrous environmental & social impacts. Perhaps new residents should have to experience congestion instead of having new roads.	None	Yes
16	Davidson, 5 th Concession	Route N/S traffic along Waterdown Road to new interchange at H403. Dundas Street cannot be widened, Parkside Drive is the obvious second choice.	None	Yes
17	Onufer, Millgrove	Plan new corridors before development takes place. Hwy 5 is above capacity. What is happening to planned Waterdown By-pass and Mid-Pen corridor?	Letter responding to each point with clarification.	Yes



**EXHIBIT 9.1 – SUMMARY OF COMMENTS RECEIVED FROM PUBLIC OPEN HOUSE HELD
ON JUNE 24, 2004**

#	ATTENDEE (all Waterdown addresses, unless stated)	COMMENT	RESPONSE FROM STAFF (If applicable)	WISHES TO BE ON MAILING LIST
18	Calmusky (sp?), Cottonwood Crescent, Oakville	What is relationship between this EA and Watedwon/H403 EA?	Response to explain the relationship.	Yes
19	O'Brien, Kerns Road	Concerns: Traffic through Burlington roads; Loss of green belt; Impact on escarpment with new roads.	None	Yes
20	Lee, McDonald Court	Make sure modelling uses 2+ cars per household. Consider transit to Burlington and GO Station. Expand parking lots at GO Stations. Secondary planning important. Concern for environmentally sensitive areas. Improve escarpment crossings. Increase EW capacity in at least 2 corridors. Don't do anything until MOT have a plan for Clappison Corners. Maintain current level of Vinegar Hill – no more lanes. Make development pay for a by-pass.	None	Yes
21	Taylor, Flatt Road, Burlington	Good presentation. Please add Bill 27 (Green belt) lands on maps when possible. GO Transit expansion may happen, will affect traffic levels. NS Roads from Stantec study should be resurrected, new escarpment crossing is necessary.	None	Yes
22	Allan Flanders Dr.	When will public transit in Waterdown? Concerned about volumes of traffic that could be routed along Mountain Brow Road. Don't extend Flanders Drive to the new development area. Who are the landowners signing the Memorandum of Agreement.	Letter to respond to various questions.	Yes
23	Vanca, Cumberland	Widen Parkside Drive	None	Yes



**EXHIBIT 9.1 – SUMMARY OF COMMENTS RECEIVED FROM PUBLIC OPEN HOUSE HELD
ON JUNE 24, 2004**

#	ATTENDEE (all Waterdown addresses, unless stated)	COMMENT	RESPONSE FROM STAFF (If applicable)	WISHES TO BE ON MAILING LIST
	Avenue, Burlington	Plan for the Waterdown By-Pass possible using Mid-Pen Corridor. Do things more quickly. Contact drivers in the area to get suggestions.		

APPENDIX A

SUB-AREA MODELLING

APPENDIX A – SUB-AREA MODELLING

A.1 Trip Assignment

The terms of reference for this study included the completion of a sub-area model in order to both identify future network needs while also testing the results of the 1999 Stantec study. The Stantec report resulted in recommendations for additional east-west and north-south capacity which were identified as being the "Red Route" and "Green Route" respectively (refer to Exhibit 2.1). This analysis is presented here for academic interest only as an assessment of the previous work done in 1999 by Stantec.

As this report concludes, the Red and Green Routes have no current validity. The identification of a future network will be the subject of intensive investigation in a subsequent phase of this study.

It should be noted that a short section of a new north-south roadway is included in all network scenarios between Parkside Drive and just south of Dundas Street as this would be required as a collector road (at least) in order to serve the development areas adjacent to it.

A nominal horizon year and full build out of OPA 28 was considered to be 2008. The labelling of the horizon year is somewhat academic. It is meant to be a near/mid-term horizon suitable for the modelling technique being used - longer term horizons are not appropriate for this technique.

To calculate the total future traffic for a given development scenario, the individual turning movements for each trip assignment were summed and added to the established base year (existing traffic) plus background growth. This background growth represents increases in the through traffic flows in Waterdown unrelated to development otherwise taken into consideration. For this purpose, a growth rate of 2% per annum (12.6% over 6 years from 2002 to 2008) was applied to through trips only on Hwy. 6 and Dundas Street.

The various trip assignments are shown summarized at the end of this Appendix (**Exhibits A3.4 to A3.21**) for each of the scenarios identified by a tick in the following table.

EXHIBIT A1.1 – TRIP ASSIGNMENT SCENARIOS

Network Scenario	Development scenario	
	50% OPA 28 + all Aldershot	100% OPA28 + all Aldershot
Base Network	✓	✓
Base network with Red Route added	✓	✓
Base network with Green Route added	✓	
Base network with both Green & Red Route added		✓

A.2 Network Analysis

The total traffic assigned to the various networks were then subjected to SYNCHRO network-wide timing and offset optimization as some modifications to timing will certainly occur by the horizon year, however no geometric changes were assumed other than those reflecting either

the Red or Green routes (depending on the scenario). See scenarios examined in **Exhibit A.2.1** below.

EXHIBIT A2.1 – DEVELOPMENT/NETWORK SCENARIO ANALYZED

Network Scenario	Development scenario			
	none	Background Growth only	50% OPA 28 + part Aldershot	100% OPA28 + all Aldershot
Base Network	✓	✓	✓	✓
Base network with "Red Route" added			✓	✓
Base network with "Green Route" added			✓	
Base network with both Red and Green Routes added				✓

Detailed operational analysis was carried out for the PM peak hour to represent the worst case, as the PM generates considerably more traffic than the AM, and is already considered the worst time period under existing conditions. To summarize the effects on the key intersections:

- Hwy. 6 at Parkside: acceptable at 50% OPA 28, several movements reach capacity at 100% OPA 28 development with the base network. The Red route will attract additional traffic from the north and south but will also alleviate problems to some degree as the intersection would be improved at Hwy. 6, so overall operations are expected to be acceptable at 50% OPA 28, and slightly over capacity at 100% OPA 28. The Green route is not expected to have a significant impact at this location.
- Hwy. 6 at Hwy. 5/Dundas Street: in the base network several movements reach capacity at 50% OPA 28, and several are significantly over capacity at the 100% OPA 28 level. The Green route offers no significant benefits, the Red route makes things somewhat worse by attracting additional traffic to Hwy. 6 instead of letting it go through the village.
- Parkside at Centre/Hamilton: fails at 50% and 100% OPA 28 due mainly to conflicts between strong east-west through demand and opposing left turns. With the Red route present, it returns to good operations. The Green route is not expected to have an impact here.
- Dundas at Hamilton / Main / Mill: these closely-spaced string of signals will have failed movements (particularly at Mill St.) at the 50% OPA 28 level with the base network, and these worsen considerably at the 100% OPA 28 level. The Green route offers clear improvements by giving new OPA 28 traffic a more direct route to/from the south. The Red route offers little improvement at all.
- Dundas at Evans: approaching capacity at 50% OPA 28 and just over capacity at 100% OPA 28 without network improvements. The Green route offers significant benefits by allowing more traffic direct access to/from the south. The Red route makes things somewhat worse by diverting traffic from the right turn to NB Evans to the WB through movement, though it will be acceptable at the 50% level, going over-capacity at the 100% level. The combination of Red and Green routes should let the intersection run near capacity at the 100% OPA 28 level.
- Regional Road 5 at Brant: several heavy conflicting movements fail in both the 50% and 100% OPA 28 scenarios. The Green route offers considerable improvements by significantly reducing the NB-L movement, however it will still be over capacity at the 50% level. The Red route offers minor improvement, mainly by improving the connection to Hwy. 6 at the west end of Waterdown, resulting in traffic using Hwy. 6 instead of Brant St. for



N-S movement. Both Red and Green routes combined still do not permit acceptable operations at this intersection.

- Brant at North Service: some movements will exceed capacity at the 50% OPA 28 level. The Green route will allow the intersection to operate at capacity at the 50% level, but the Red route has minimal effect here. The 100% OPA 28 level results in several over-capacity movements even with both the Red and Green routes in place.
- North Service at Kerns: this location will be just at capacity at the 50% level and slightly worse 100% level with the existing network. Addition of the Green route at 50% OPA 28 understandably increases the through traffic on North Service, though no movements reach capacity. The Red route offers significant improvement over the base network, as traffic is attracted to the more northern Waterdown access points. At 100% OPA 28, the Red route alone shows demand to be near capacity, but adding both the Red and Green routes to the 100% scenario makes the intersection fail due to the increase in E-W traffic on North Service resulting from the attraction to the Green route.
- North Service at King: expected to be at capacity at both the 50% and 100% OPA 28 development levels in the base network. Adding the Green route at the 50% development level re-routes some traffic from the WB through movement to the WB right turn, but the intersection can be maintained at capacity. Adding the Red route alone causes a significant improvement by diverting traffic from North Service Rd., and the intersection shows no over-capacity movements. At the 100% development level the Red route alone maintains all movements at below-capacity, but adding the Green and Red routes together at 100% causes significant over-capacity problems due to the attractiveness of the new escarpment crossing offered by the Green route. However, the existing intersection geometry is simple and addition of some auxiliary lanes would likely offer significant improvements.
- North Service at Waterdown: both the 50% and 100% OPA 28 development levels will have this intersection well over capacity. The Green route will make things somewhat worse by increasing pressure on North Service Rd., and the Red route will not help at this location – it appears to make things slightly worse, perhaps by giving north Waterdown development traffic an easier route to Waterdown Rd. The combination of Red and Green routes at the 100% level shows considerable problems here.
- Waterdown at Hwy. 403 off-ramp / GO Station: this location appears relatively insensitive to the new routes, with movements over capacity at both the 50% and 100% OPA 28 development levels regardless of the new routes implemented. Its proximity to the key intersection of North Service and Waterdown to the north may constrain the flexibility in signal timing due to the limited queue storage on the bridge over Hwy. 403.

The results for intersection movements with v/c greater than 0.80 are summarized at the end of this appendix. It should be noted that in a number of locations the traffic model was unable to insert the entire projected vehicle demand into the model (e.g. at Regional Road 5 and Brant, and at Hwy. 6 at Hwy. 5 /Dundas) due to the over-capacity conditions, so the delay figures are not particularly practical – suffice it to say that delays at the over-capacity locations will be considerable.

A.3 Ultimate Network Needs

Following a review of the initial assignments and SYNCHRO results, a final ultimate road scenario (again based on the 1999 Master EA "Red and Green" routes) was prepared with some minor refinements of the assignments as well as an identification of all the improvements

that would be required for the final network to operate within or as near to capacity as possible. This section documents the road network improvements which will likely be required to service the traffic growth resulting from the following changes in the study area:

- the full development of OPA28 lands;
- the planned developments in Aldershot to the year 2008; and
- background trip growth along Hwy. 6 and Dundas St.

A new SYNCHRO network was prepared to model the PM peak hour (worst case). The network included the following improvements:

- the Red Route (assumed to terminate at Hwy. 6 at the current location of the Parkside and Hwy. 6 intersection, although MTO has made no commitment that this will be permitted);
- the Green Route, connecting King Rd. to Dundas St.;
- widening of North Service Rd. to a basic 4-lane cross-section from Brant St. to Waterdown Rd.; and
- sufficient other improvements to have no single intersection movement with a forecast v/c of over 1.0.

No improvements were assumed for the intersection of Hwy. 6 and Hwy. 5/Dundas St. however, as it is in Provincial jurisdiction and there are plans for it to be grade separated at some time in the future. The analysis also supported this improvement as it appeared impossible to get reasonable operations at that location with future traffic projections and an at-grade intersection. While the Red Route will relieve some traffic, the intersection will still suffer from heavy conflicting through and turning movements from multiple directions, for which a grade separation of some type appears to be the only solution.

In addition, the results of the licence plate survey conducted for this study were used to estimate the likely magnitude of background traffic that could be shifted from Dundas St. (and to a much lesser extent Parkside Dr.) to the Red Route as a by-pass of downtown Waterdown Village. The PM peak hour survey determined that 27.5% of westbound traffic east of Evans Rd. on Regional Road 5 would go through Waterdown and end up west of Hollybush Dr., with the vast majority on Dundas St. and a small remainder (approximately 5%) on Parkside Dr. On the assumption that these trips would use the Red Route to get around the Village, approximately 480 background westbound through trips were shifted from Dundas St. and assigned to the Red Route.

Based on SYNCHRO and SimTraffic analysis of the study area with the demand volumes assigned as described above, the list below gives the additional improvements that would appear to be needed in order that no intersection movements have a v/c exceeding 1.0 in the PM peak hour. Except for localized intersection widening, the Red Route can have a basic two-lane cross section.

Additional network needs:

- Widening of Regional Road 5 from 4 lanes to a basic 6-lane cross section from Brant St. to the intersection with the Red and Green Routes (at which point a large proportion of traffic will flow to/from the north or south to access the OPA28 developments and the Red Route Waterdown by-pass and the existing cross-section will be adequate to the west);

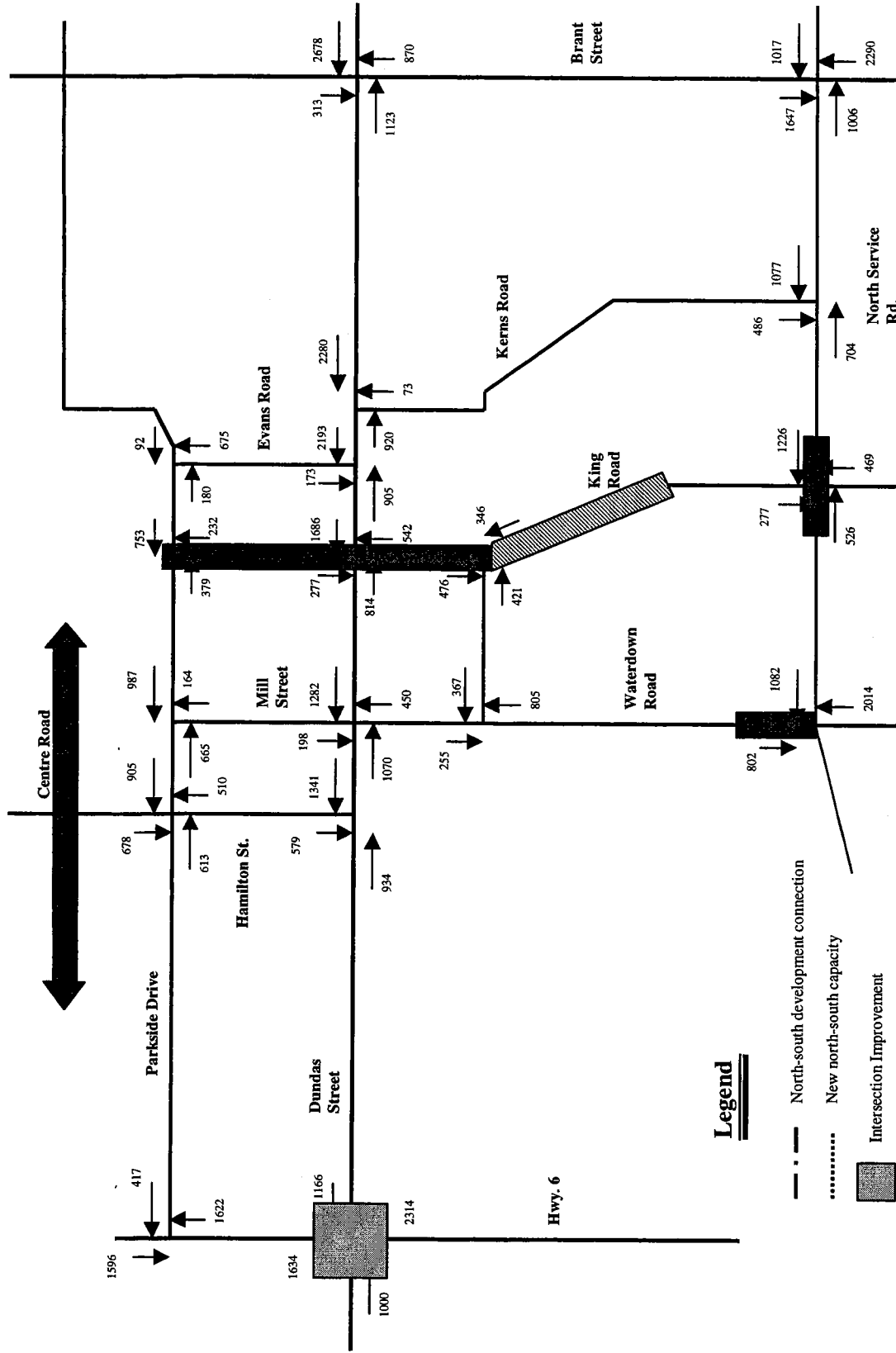


- A basic 4-lane cross section on the Red Route immediately north of Dundas St. to improve intersection capacity, which can be tapered to a 2-lane section between Dundas St. and Hwy. 6. Local widenings of the Red Route at intersections may also be required at Hwy. 6, Centre Rd. and Parkside Dr., depending on the future geometry of those roads;
- A localized widening of Waterdown Rd. to provide 2 north-south through lanes at North Service Rd. in each direction (this improvement is proposed as part of Highway 403/Waterdown Road interchange plan), this to make better use of the green time that is limited by the conflicting movement westbound to the Hwy. 403 on-ramp. In addition two westbound discharge lanes from North Service Rd. into the westbound Hwy. 403 on-ramp will be needed;
- Traffic signals will likely be required at a number of development access points (e.g. for developments accessed from Waterdown Rd. and King Rd.), depending on how traffic can be distributed among the access points – this is a matter for the planning of individual subdivisions. Similarly a signal may be required at Mountain Brow Rd. and Waterdown, and at Mountain Brow Rd. and the Green Route / King Rd., depending again on how traffic access is distributed.
- Continuation of the basic 6-lane cross section on Hwy. 6 from north of Dundas St. intersection through the Red Route (former Parkside Dr.) intersection, to make better use of north-south green time at that signal (again not certain as it depends on MTO's future configuration at this point).

The described PM peak period capacity improvements can generally be assumed to be reflected for the AM case, i.e. a widening in the eastbound direction for PM traffic will imply that a widening in the westbound direction will be needed for AM traffic, or in the case of a double left turn, a channelized free-flow right turn lane can be employed for the reverse movement.

The road infrastructure improvements for the 50% and 100% development scenarios of OPA 28 are shown figuratively in **Exhibits A3.1 and A3.2** respectively. This is basically a refinement of the recommended network plan in the 1999 Master EA report.

With full development of OPA 28 and implementation of the improvements shown in Exhibit 5.11, there will still remain some localized operational deficiencies in the Village of Waterdown. In addition, there will be some locations where operations will be approaching capacity, those being mostly on roads crossing North Service Rd., however these should not present a problem unless there is further growth in background trips or new development. These are illustrated in **Exhibit A3.3**.



**EXHIBIT A3.1 – ROAD INFRASTRUCTURE
REQUIREMENTS (50% build-out of OPA 28)**

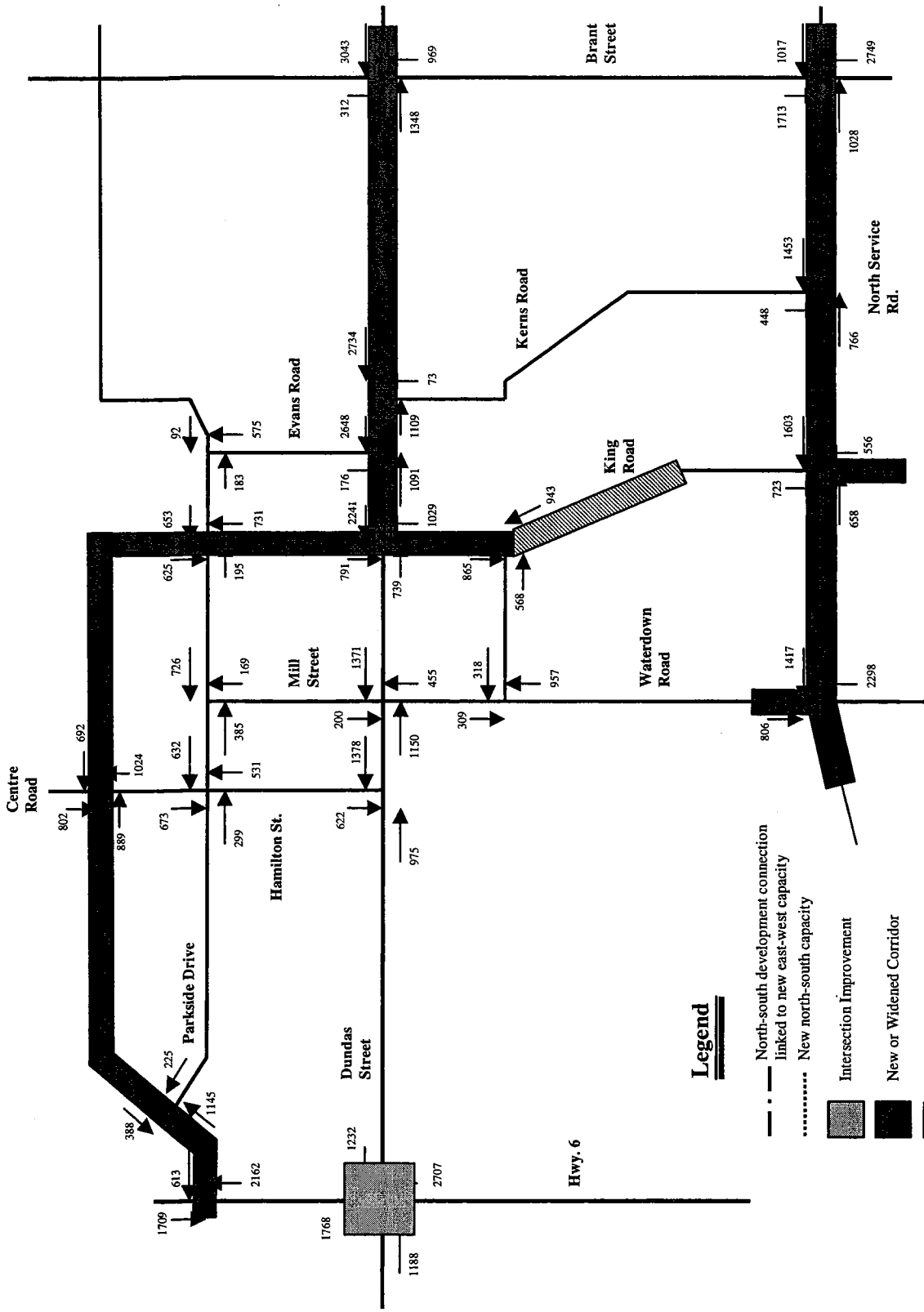


EXHIBIT A3.2 – ROAD INFRASTRUCTURE REQUIREMENTS
 (100% build-out of OPA 28, PM peak demand volumes shown)

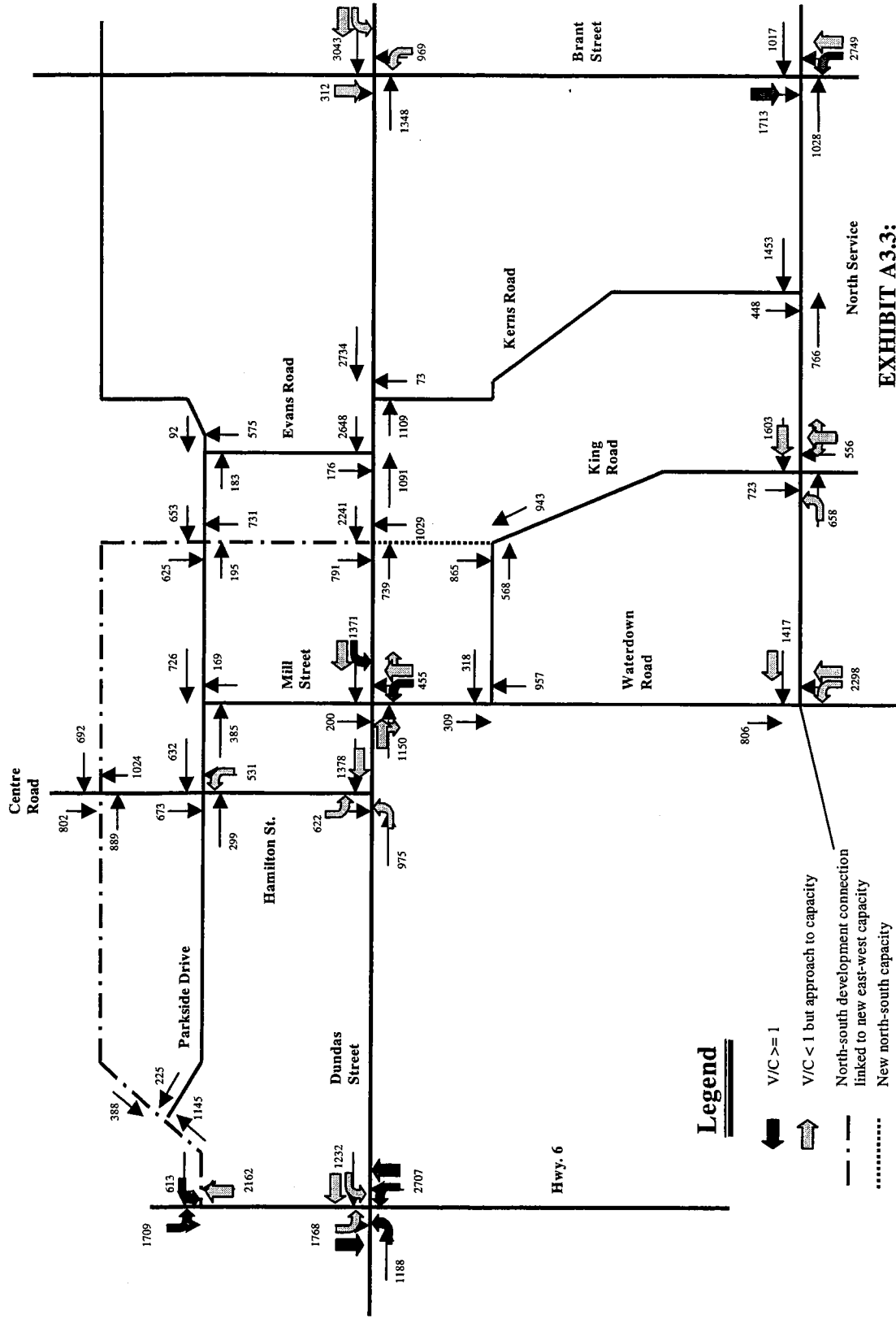


EXHIBIT A3.3:
REMAINING PM PEAK OPERATIONAL DEFICIENCIES
 (after full build-out & recommended improvements,
 PM peak hour demand volumes shown)

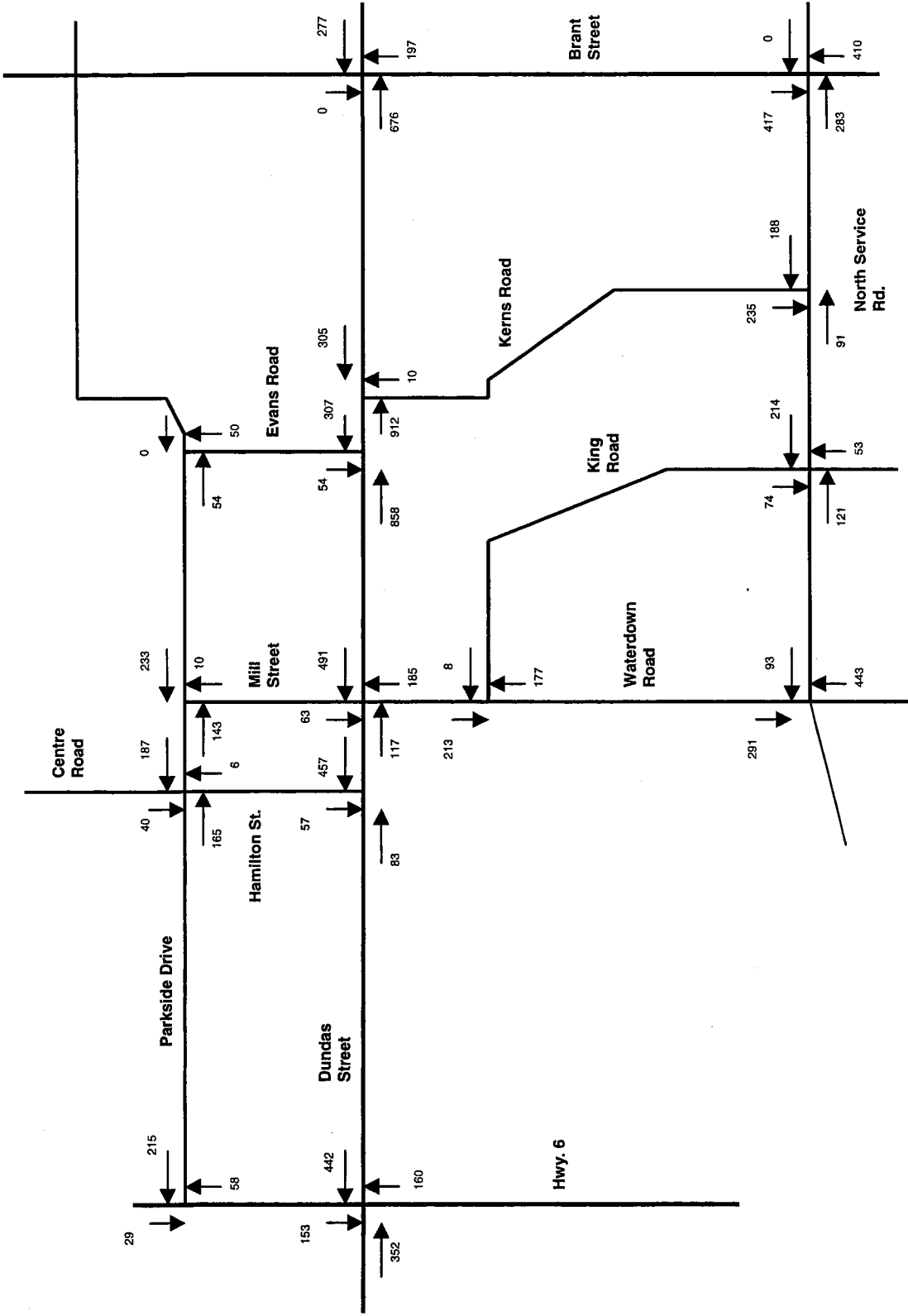


EXHIBIT A3.4 - ASSIGNMENT OPA 28 (50%) + ALDERSHOT - (AM pk hr, with base network)

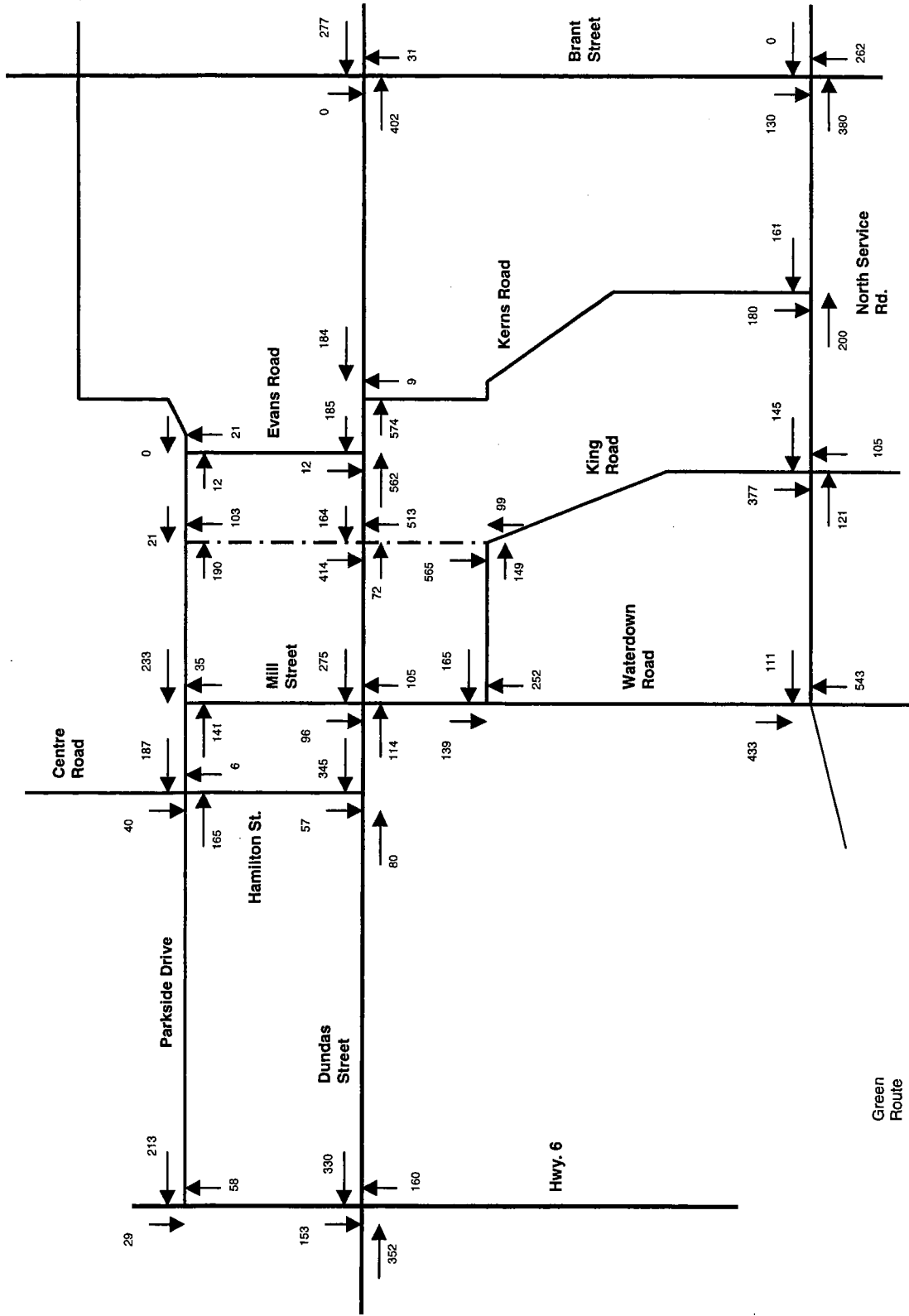


EXHIBIT A3.5 – ASSIGNMENT OPA 28 (50%) + ALDERSHOT – (AM pk hr, with green network)

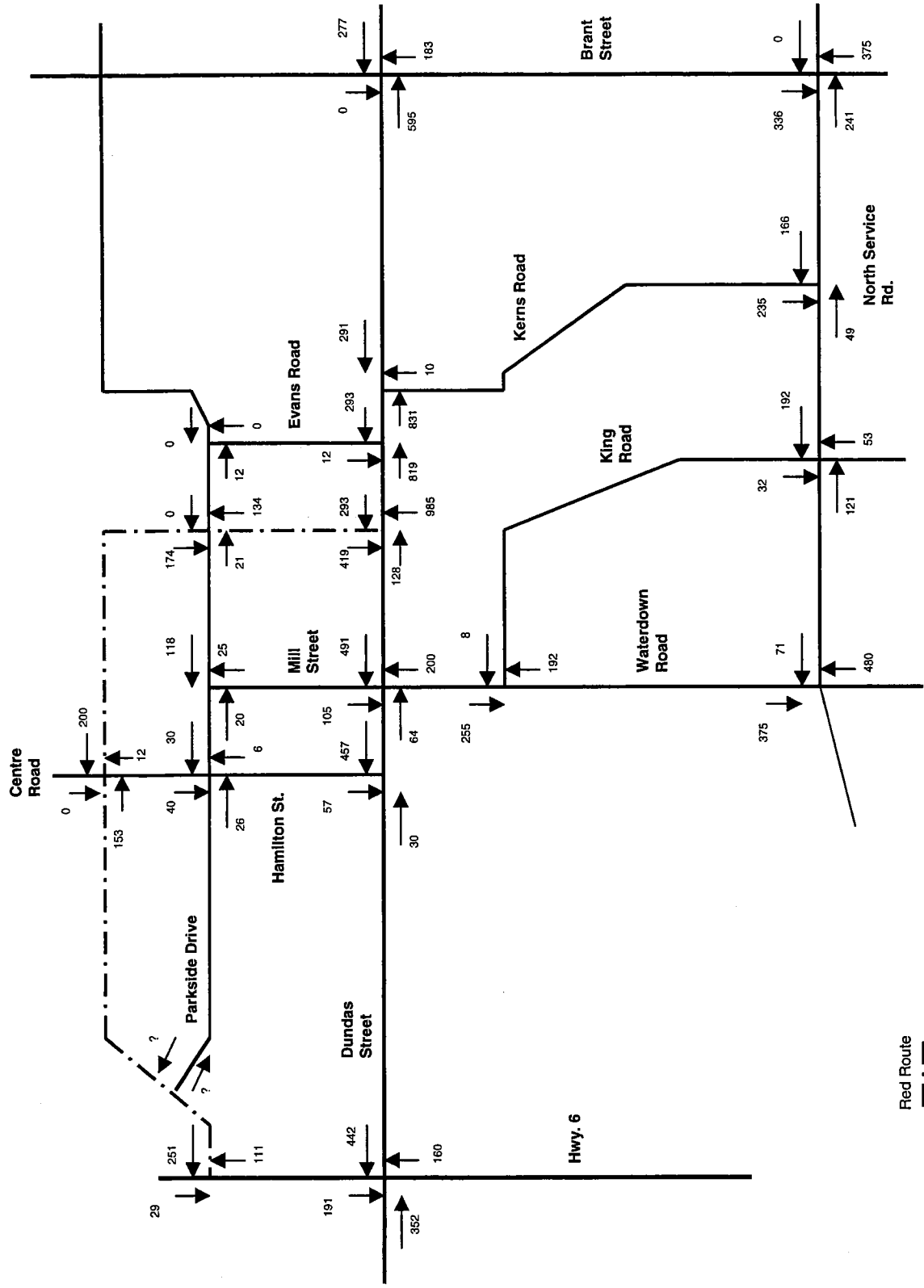


EXHIBIT A3.6 – ASSIGNMENT OPA 28 (50%) + ALDERSHOT – (AM pk hr with red network)

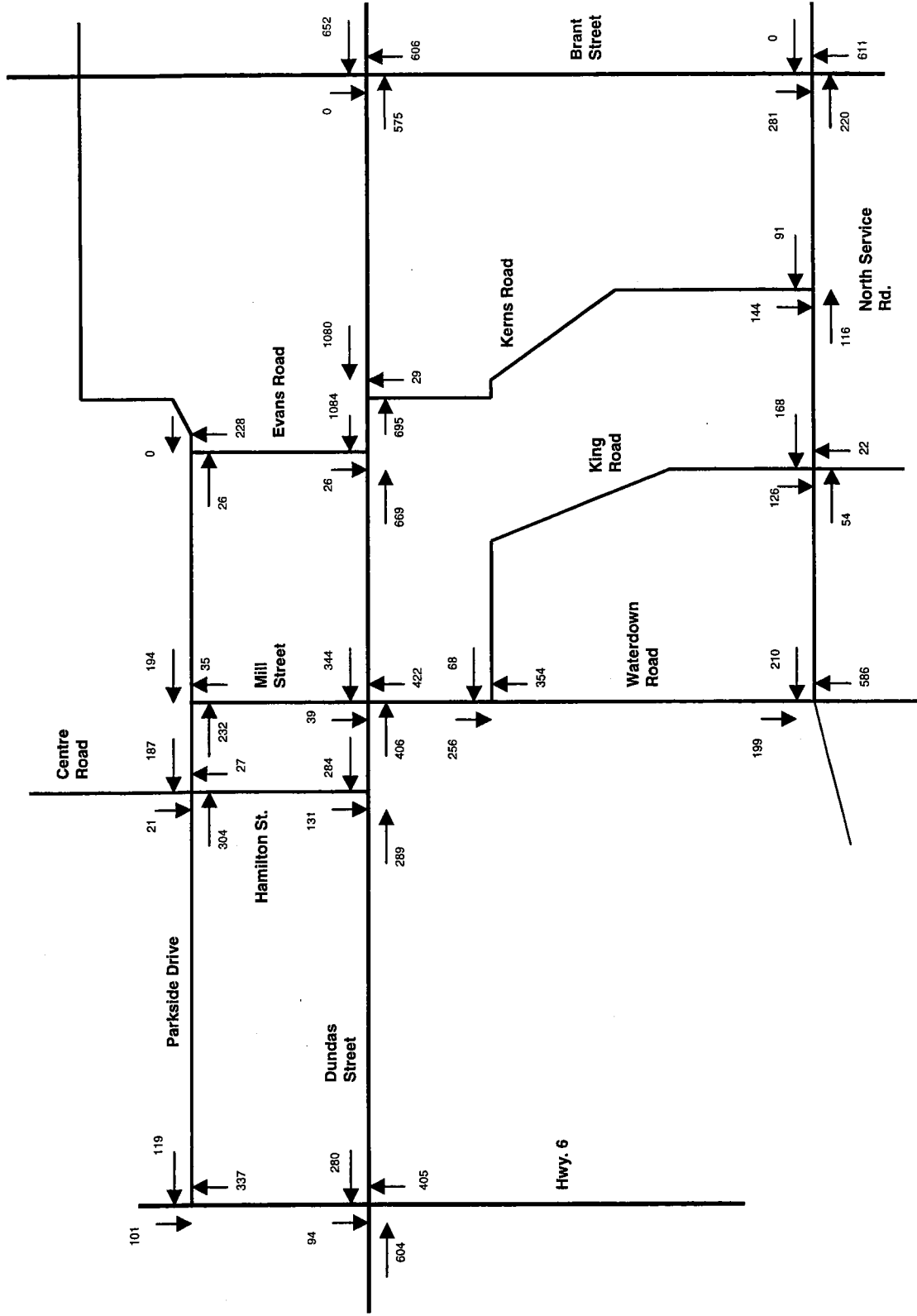


EXHIBIT A3.7 – ASSIGNMENT OPA 28 (50%) + ALDERSHOT – (PM pk hr, with base network)

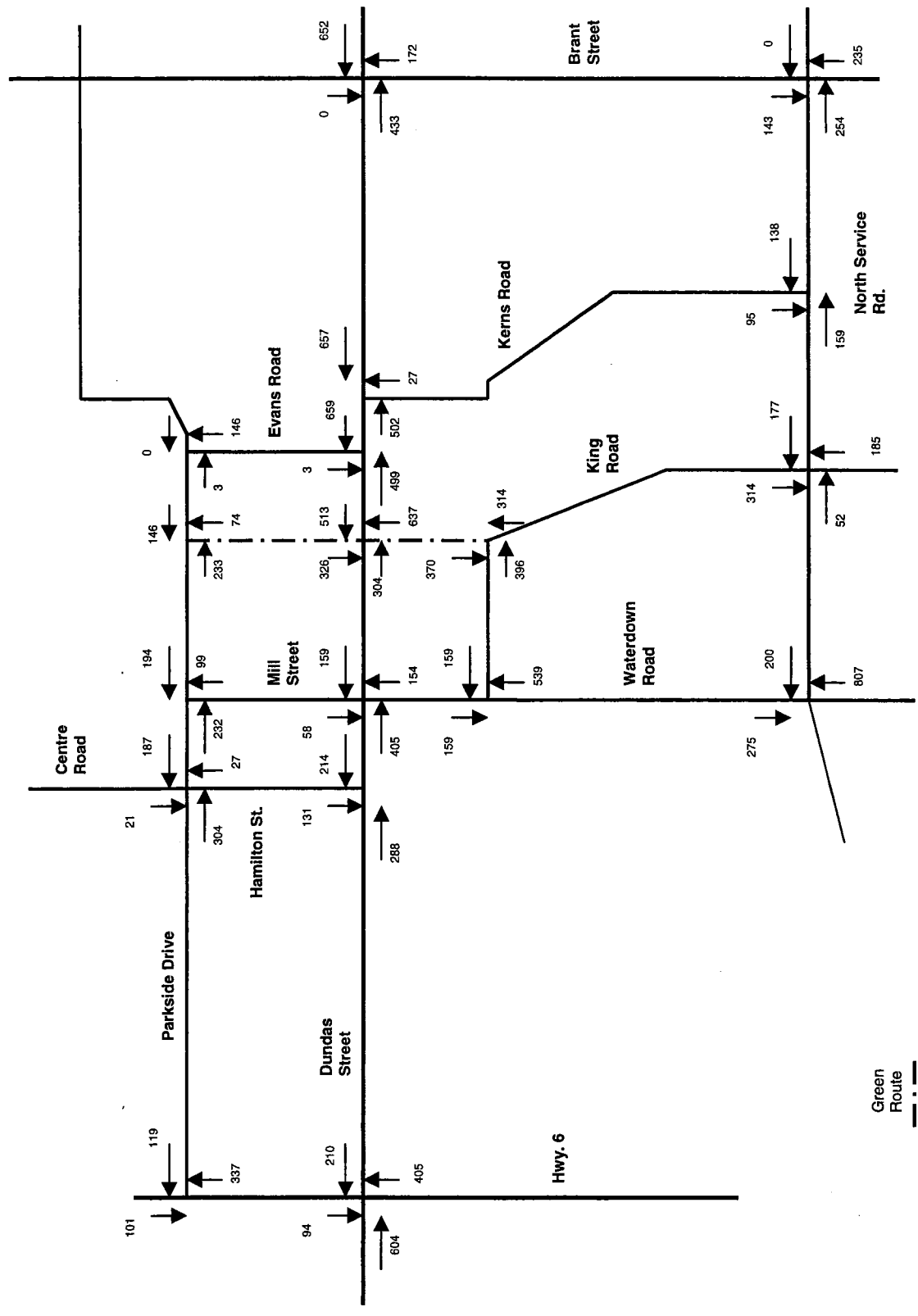


EXHIBIT A3.8 – ASSIGNMENT OPA 28 (50%) + ALDERSHOT – (PM pk hr, with green network)

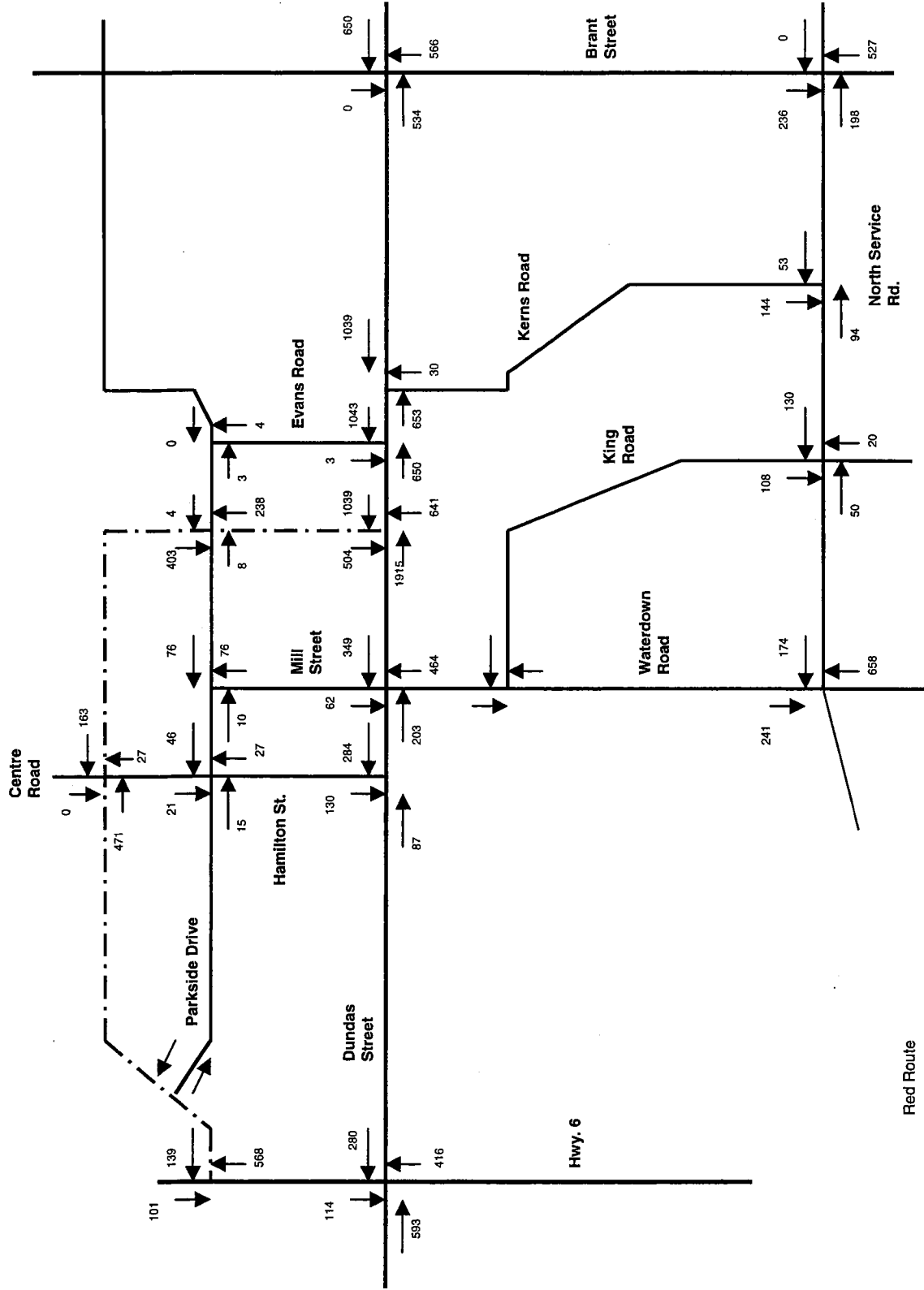


EXHIBIT A3.9 – ASSIGNMENT OPA 28 (50%) + ALDERSHOT – (PM pk hr, with red network)

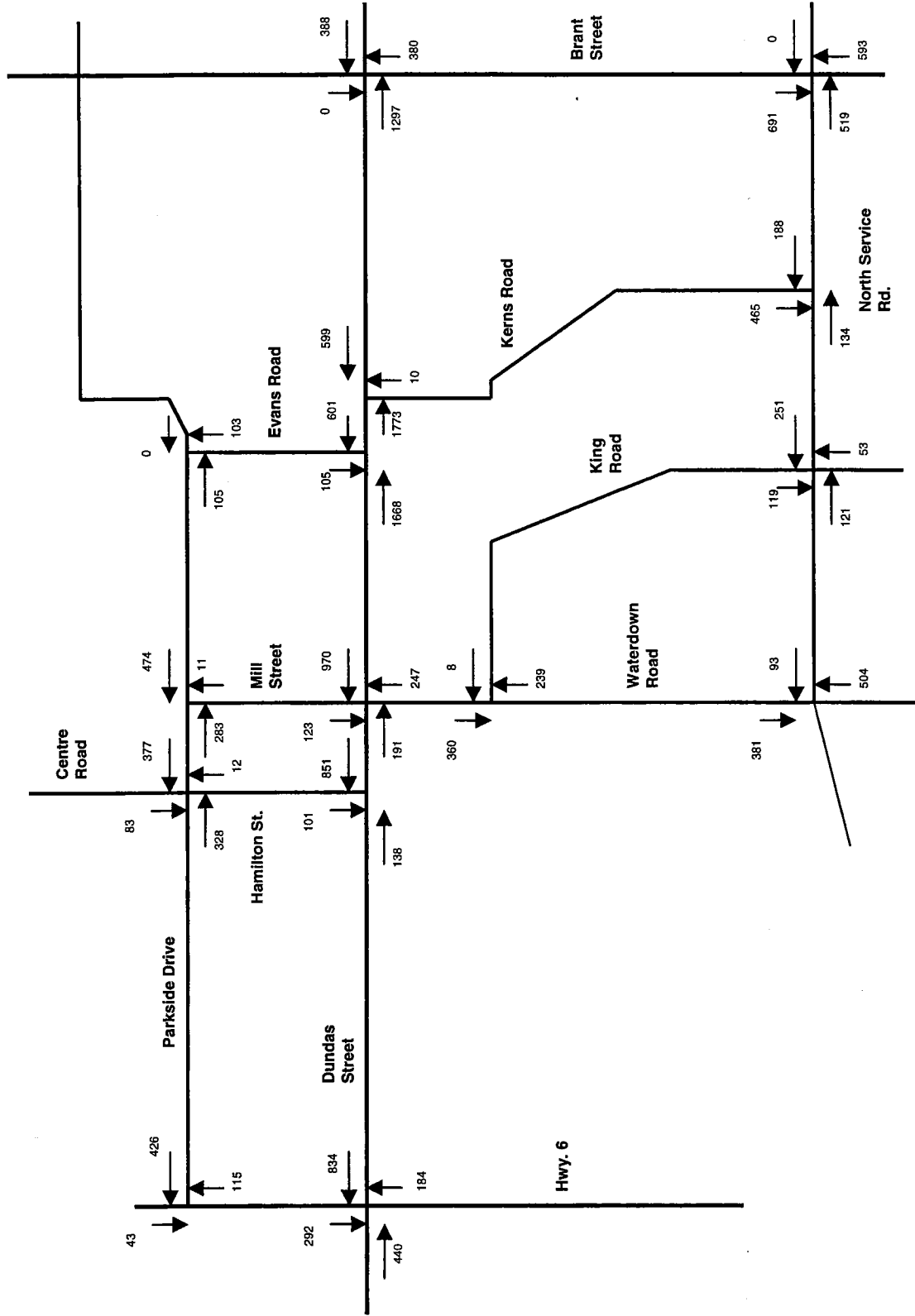


EXHIBIT A3.10 – ASSIGNMENT OPA 28 (100%) + ALDRSHOT – (AM pk hr, with base network)

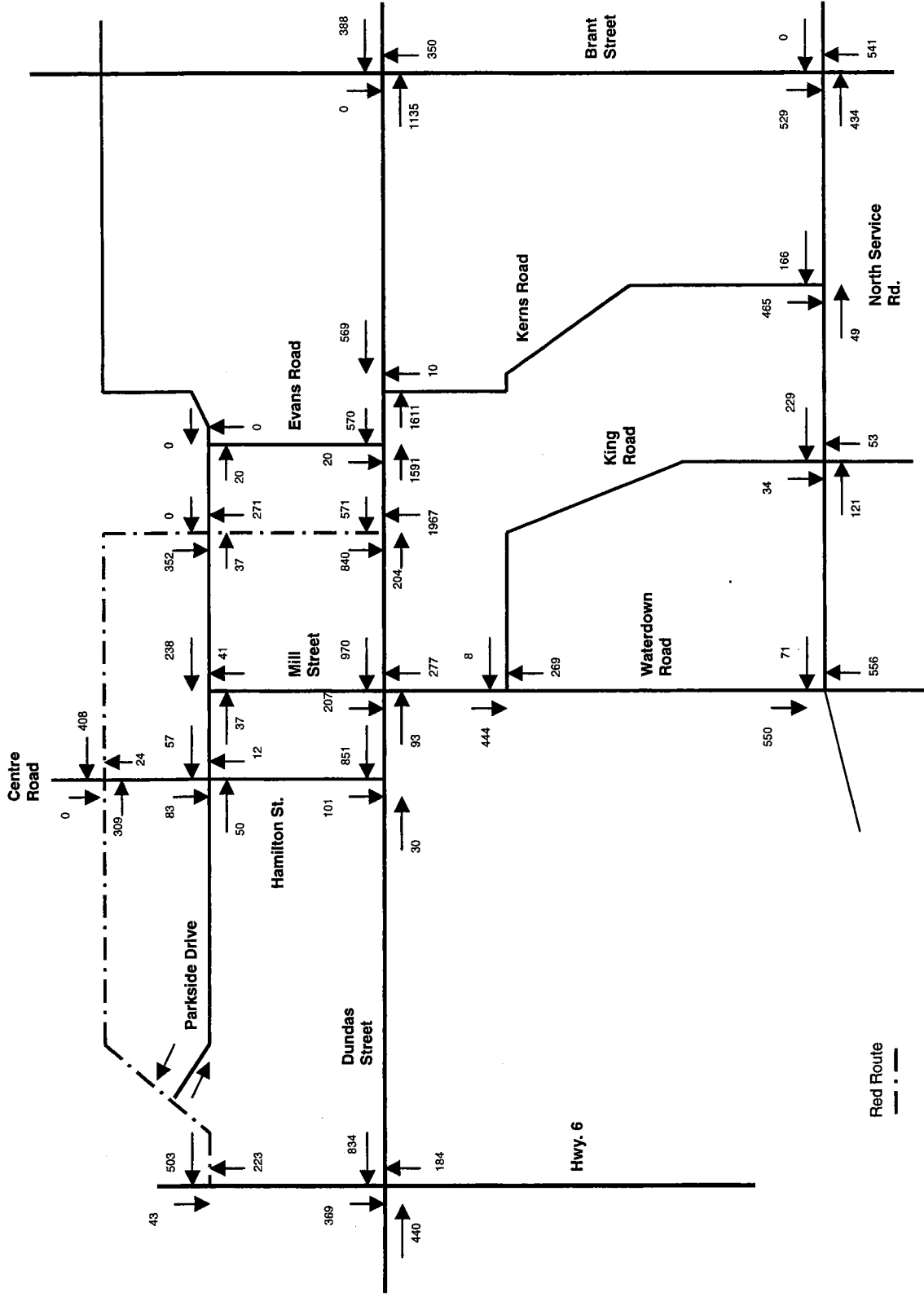
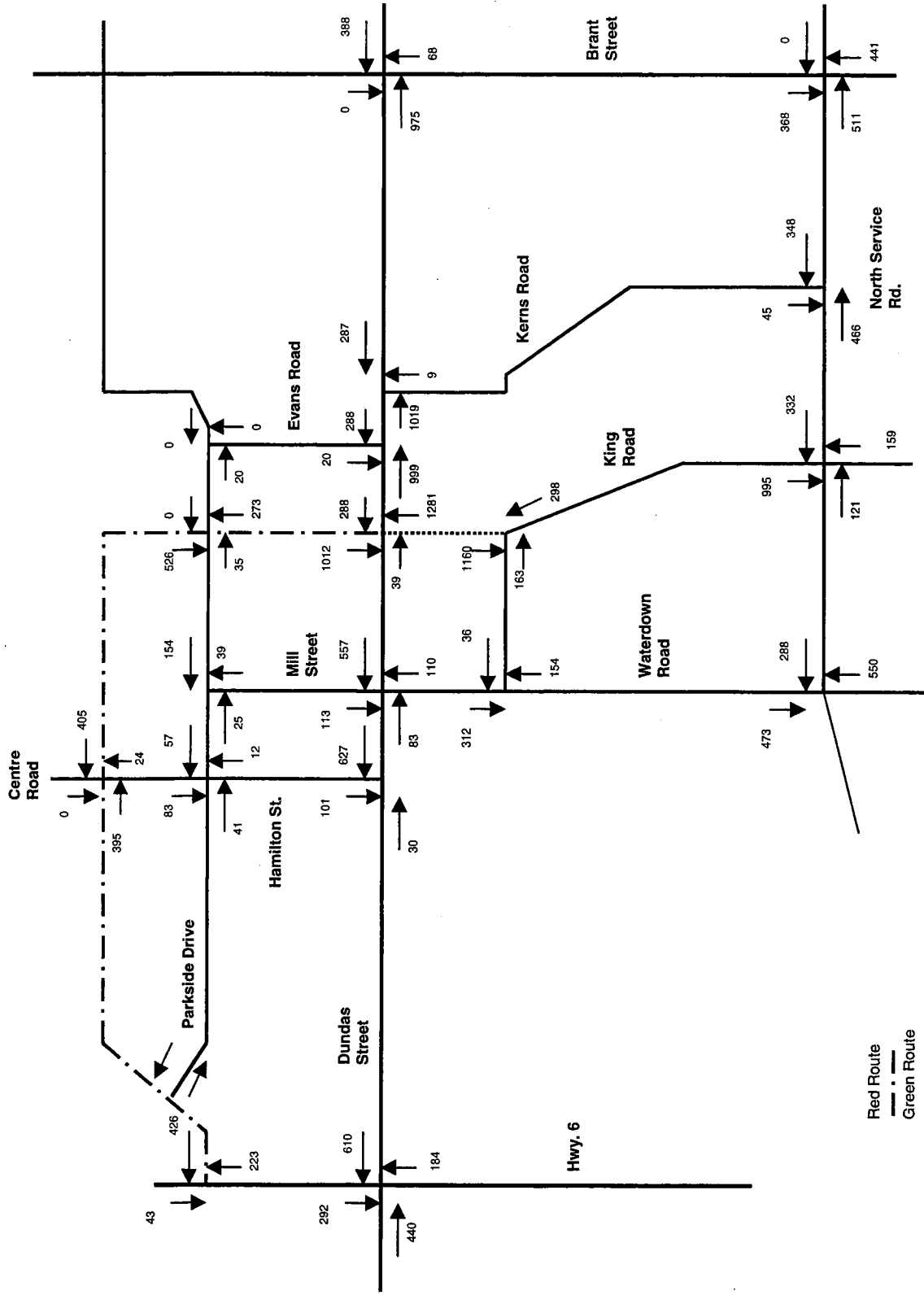


EXHIBIT A3.11 – ASSIGNMENT OPA 28 (100%) + ALDERSHOT – (AM pk hr, with red network)



Red Route
 Green Route

EXHIBIT A3.12 – ASSIGNMENT OPA 28 (100%) + ALDERSHOT – (AM pk hr, with red & green network)

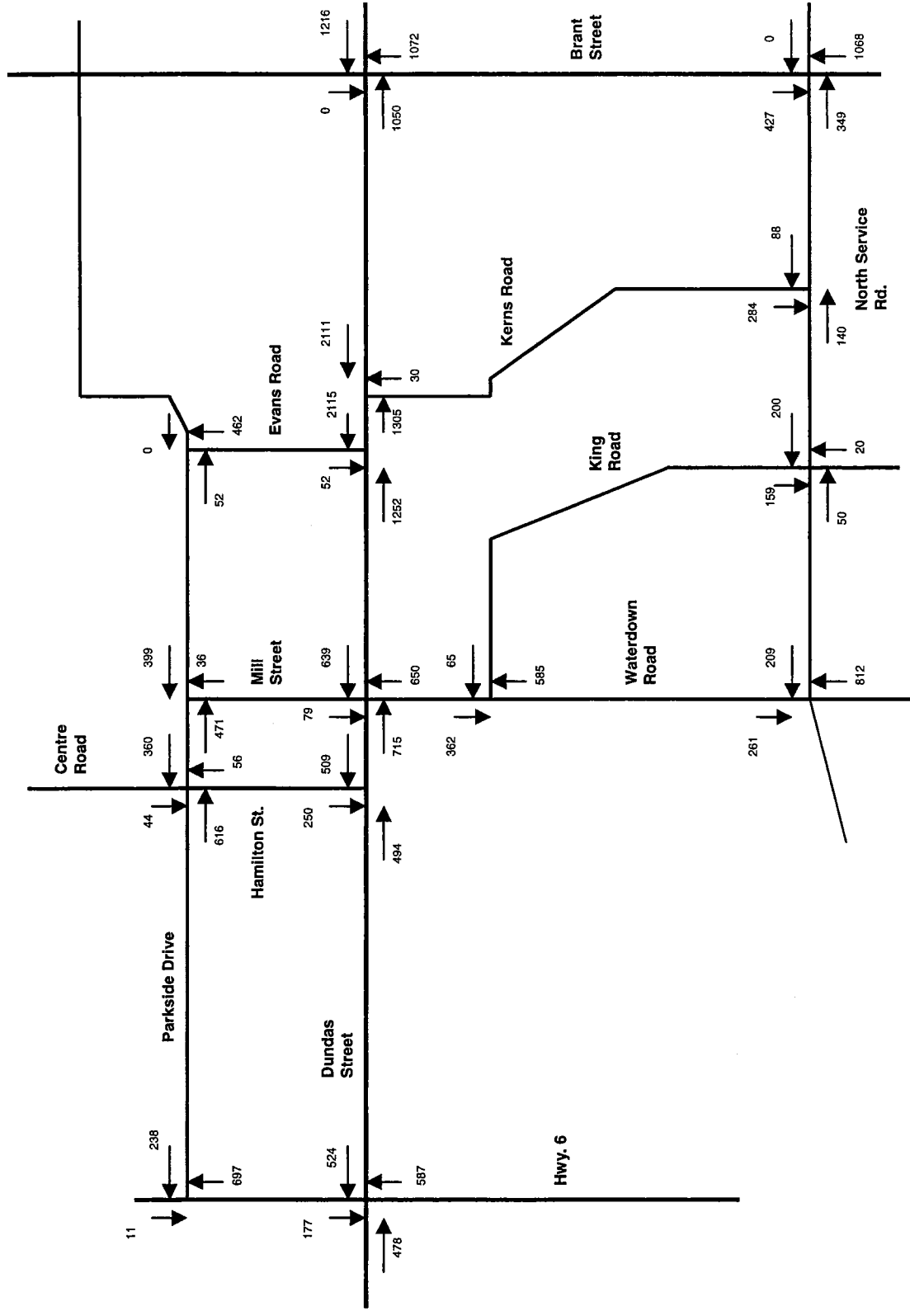


EXHIBIT A3.13 – ASSIGNMENT OPA 28 (100%) + ALDERSHOT – (PM pk hr, with base network)

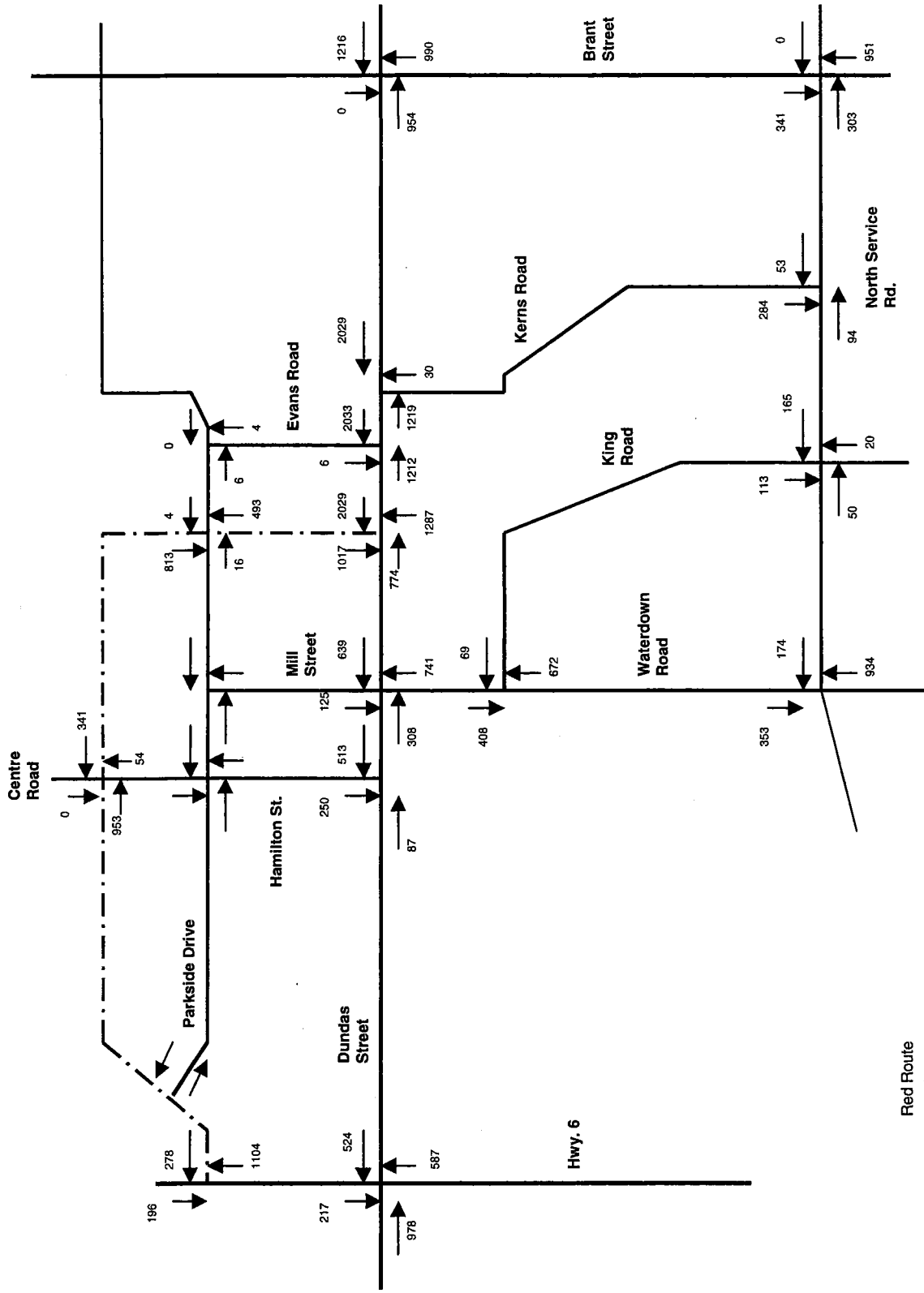


EXHIBIT A3.14 – ASSIGNMENT OPA 28 (100%) + ALDERSHOT – (PM pk hr, with red network)

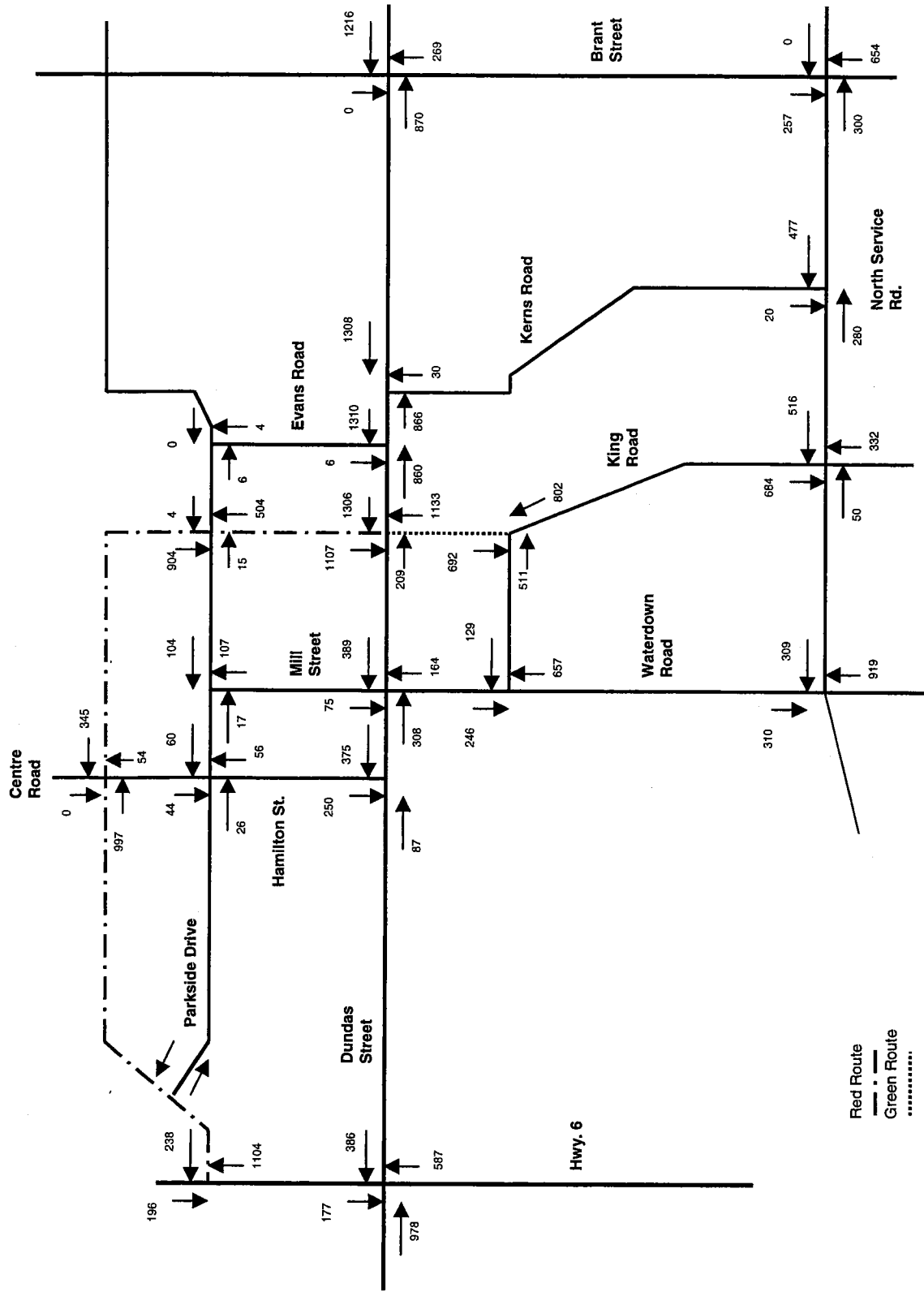
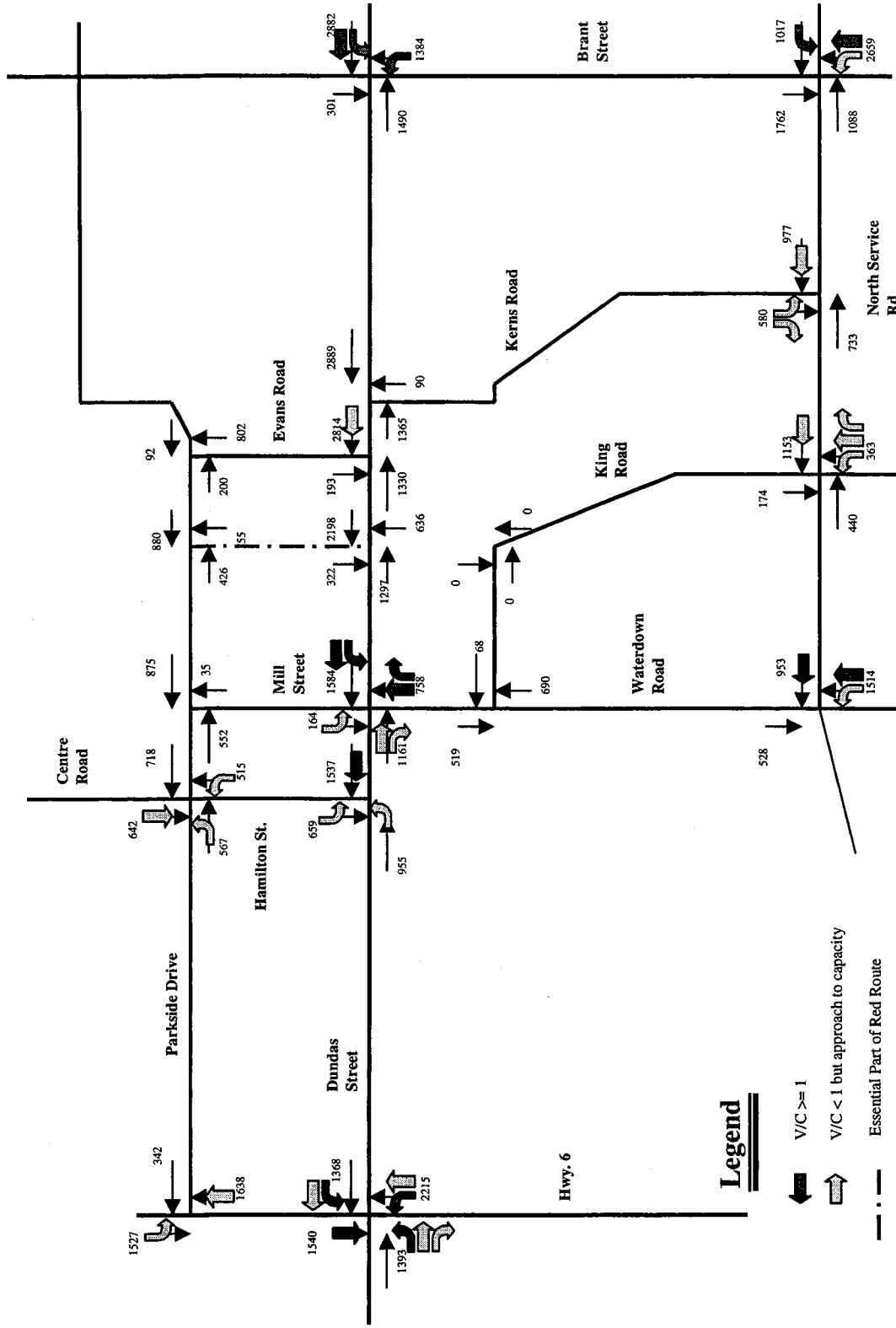


EXHIBIT A3.15 – ASSIGNMENT OPA 28 (100%) + ALDERSHOT – (PM pk hr), with red & green network)



Legend

- V/C >= 1
- V/C < 1 but approach to capacity
- Essential Part of Red Route

EXHIBIT A3.16 - TOTAL TRAFFIC: EXISTING + BACKGROUND GROWTH + HALF OPA28 (PM pk hr - base network)

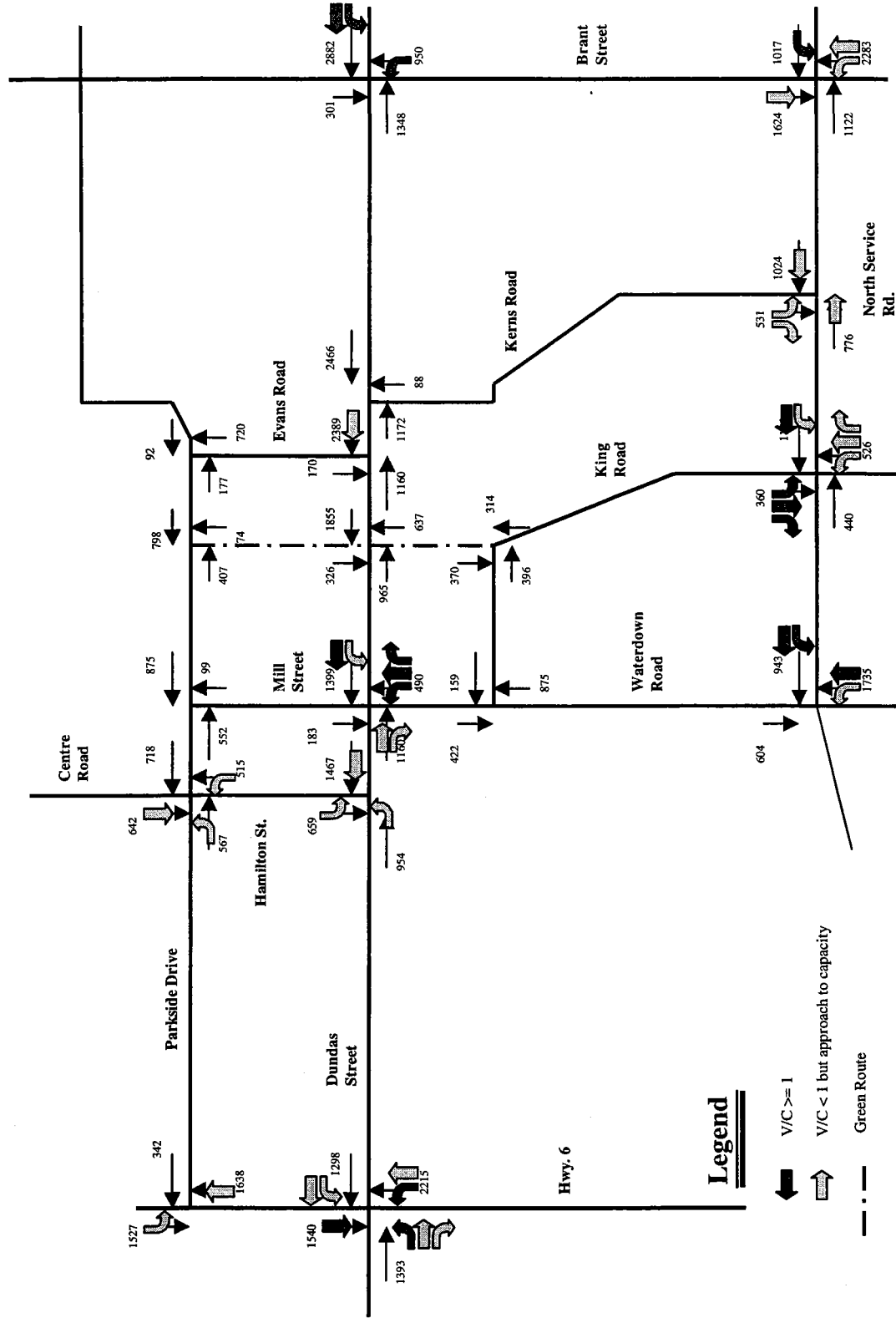
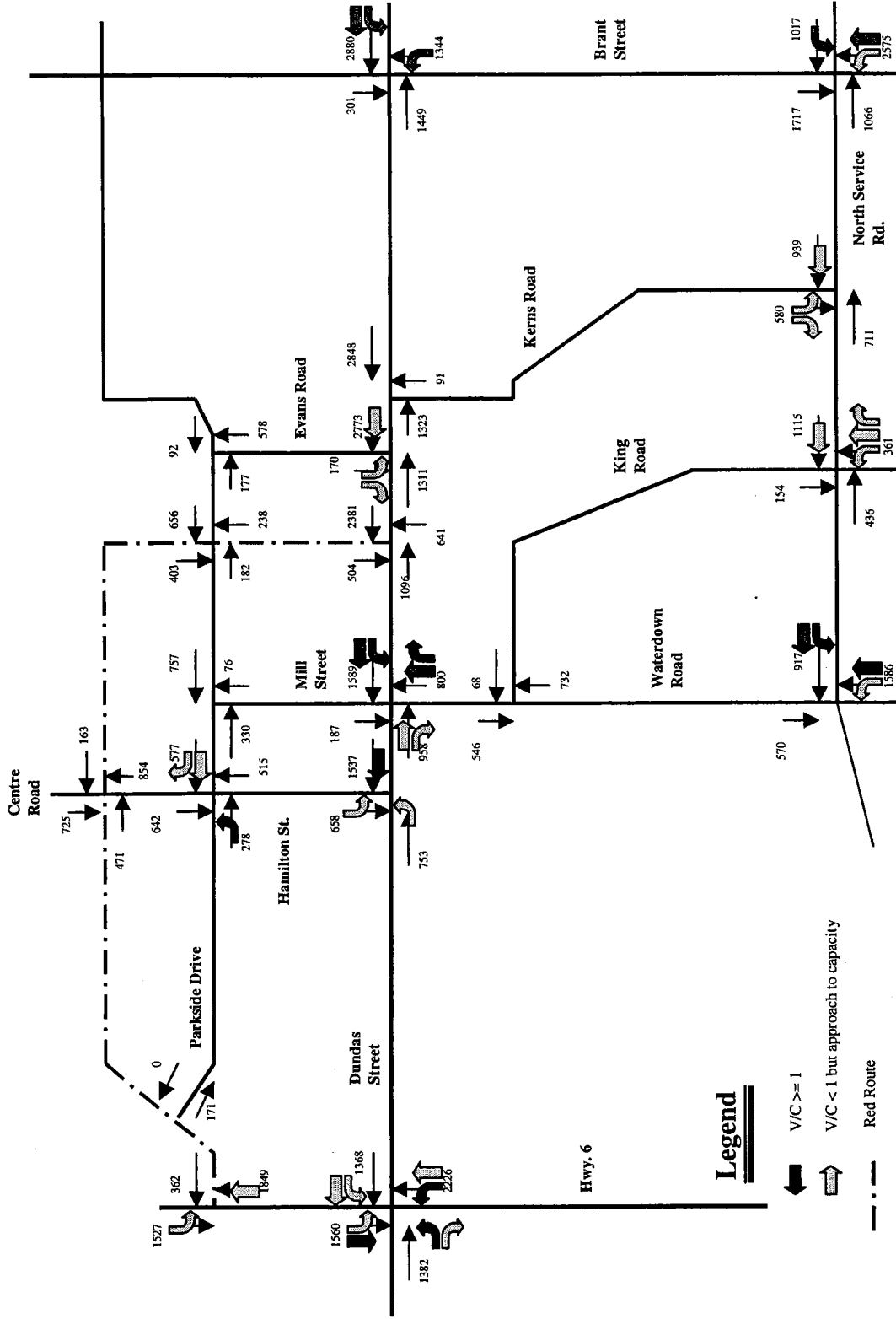


EXHIBIT A3.17 -- TOTAL TRAFFIC: EXISTING + BACKGROUND GROWTH + HALF OPA28 (PM pk, with green route)





SNC-LAVALIN
Engineers & Constructors in association with TSH

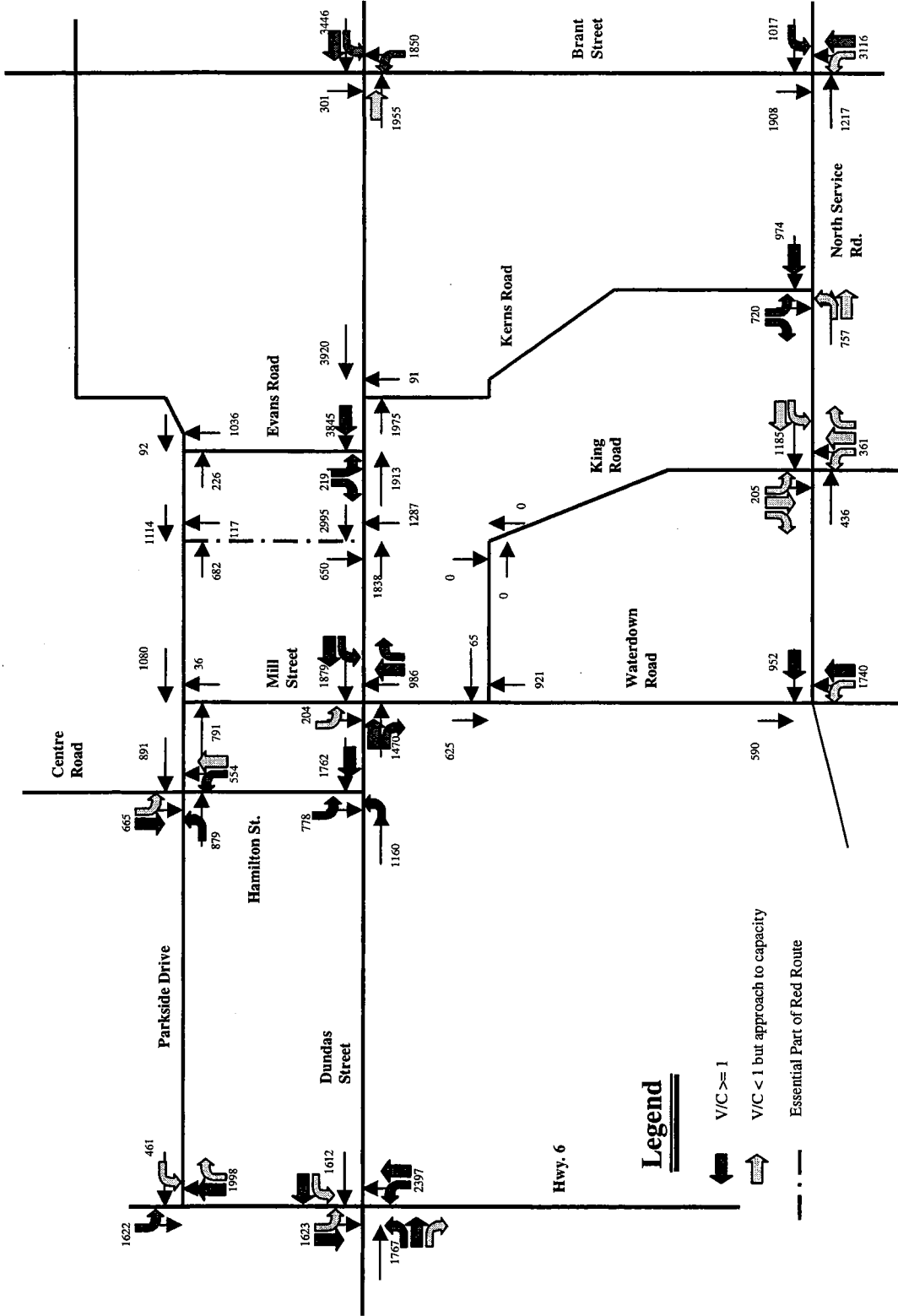


EXHIBIT A3.19 – TOTAL TRAFFIC: EXISTING + BACKGROUND GROWTH + FULL OPA28 (PM pk, with base network only)

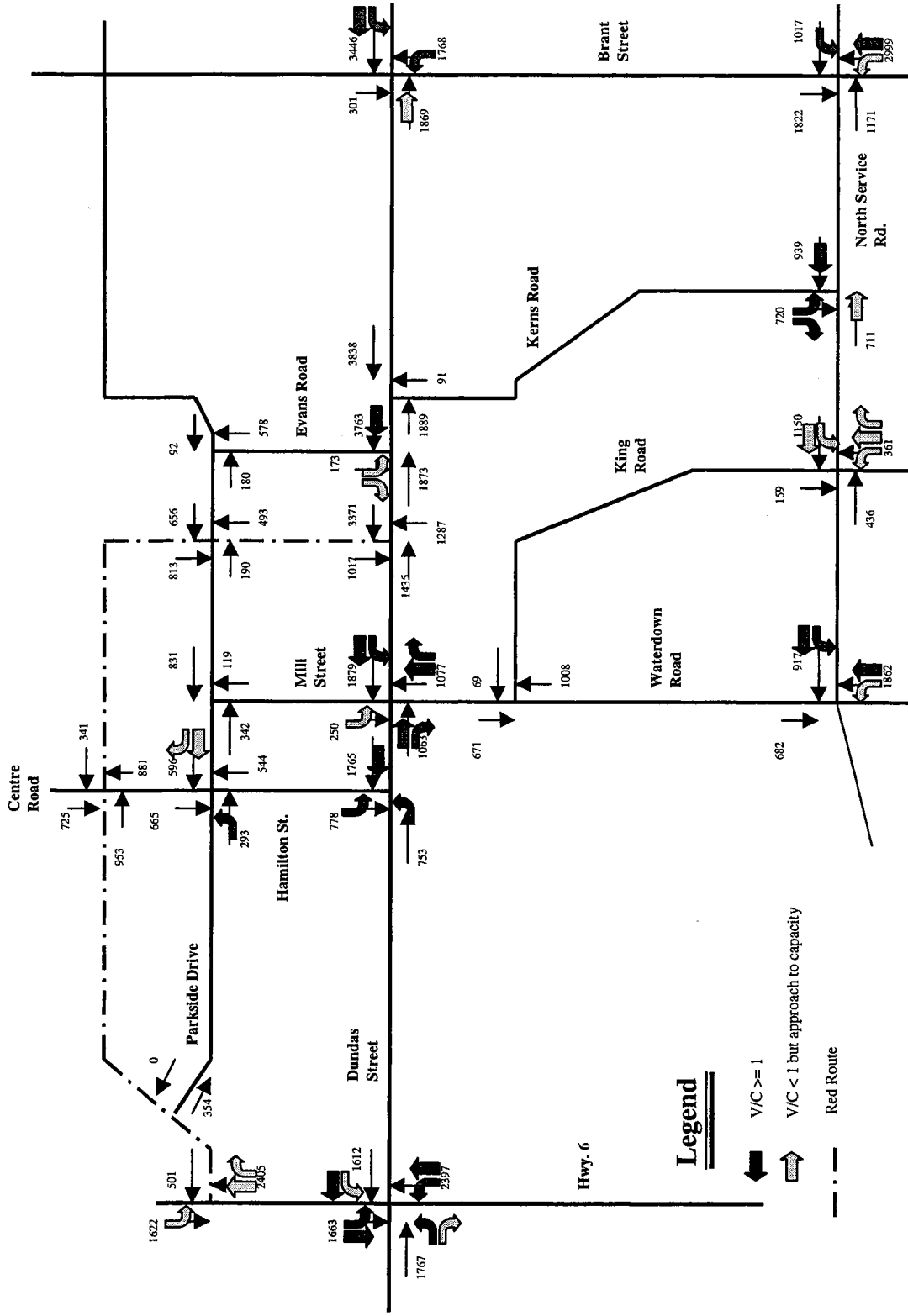


EXHIBIT A3.20 – TOTAL TRAFFIC: EXISTING + BACKGROUND GROWTH + FULL OPA28 (PM pk, with reds route)

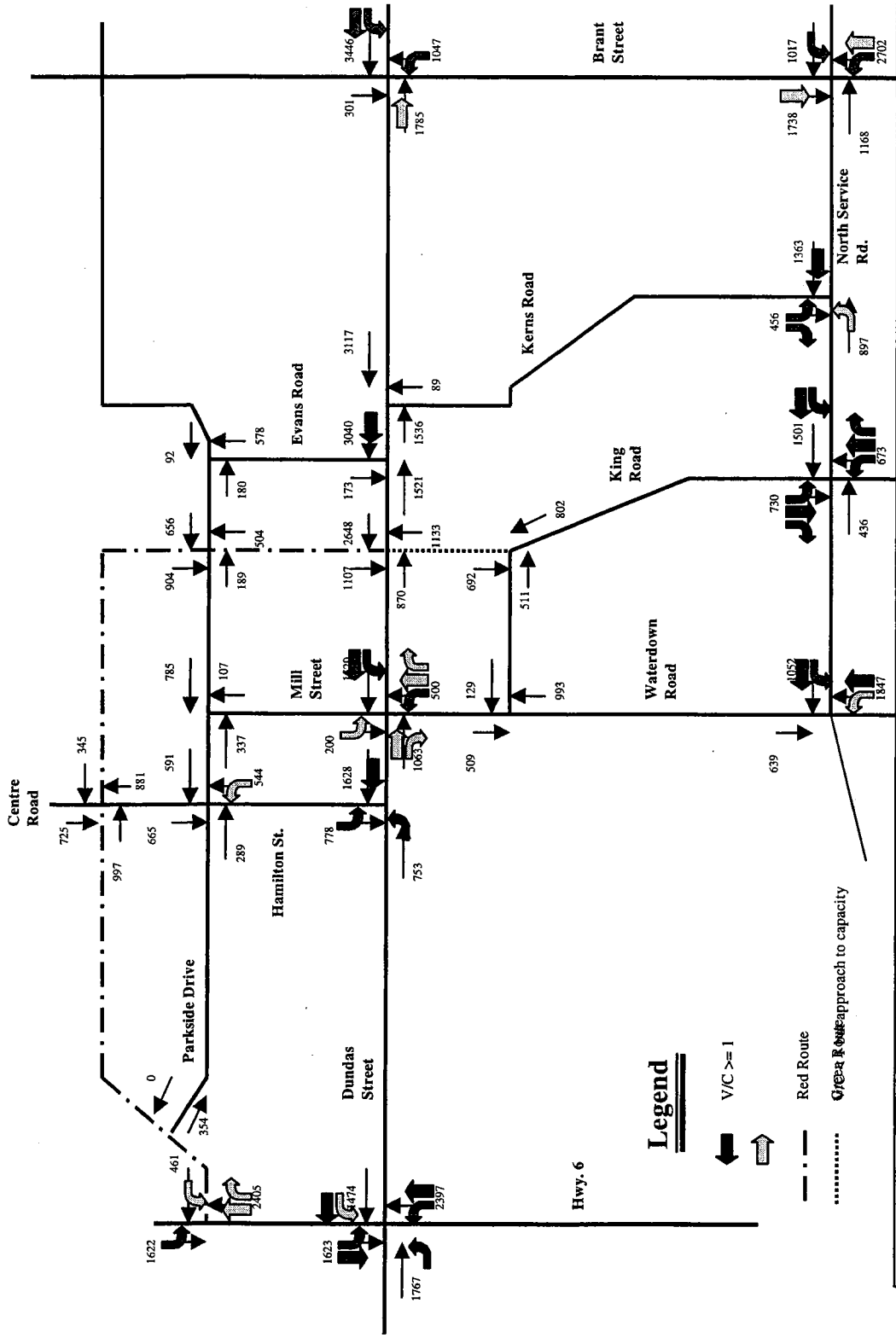


EXHIBIT A3.21 – TOTAL TRAFFIC: EXISTING + BACKGROUND GROWTH + FULL OPA28 (PM pk with red & green routes)

APPENDIX B

STRATEGIC MODELLING

APPENDIX B - STRATEGIC MODELLING

The purpose of the strategic modelling component of the study is to assess the implications of the various Niagara-GTA Corridor options on the need for arterial road improvements in the study area.

The Niagara-GTA Corridor is a proposed new facility that would stretch from the QEW, in the Niagara Falls/Fort Erie area, through the Niagara Peninsula to connect to the existing freeway network in the GTA. The need for the facility and a number of alternative alignments has been documented in prior studies. A number of potential alignments pass near to the study area, with some having greater impacts on the road network in the Waterdown/Aldershot Study Area than others. The location of the potential corridors being reviewed are shown in **Exhibit 6.1** of the main body of this report.

The following sections describe the methodology and results from the strategic modelling process.

B.1 Methodology

Strategic forecasting was undertaken for this study using the City of Hamilton's EMME/2 demand forecasting tool. Assumptions built into the model forecasts related to municipal and study area land use (population and employment) and transportation infrastructure (road network) were confirmed and modified to reflect current expectations related to the development area for the base and 2021 horizon years. Model derived AM peak hour forecasts were converted to PM peak hour conditions to reflect the critical time period in the study area. A screenline analysis was then conducted to assess existing conditions, and to strategically assess any deficiencies in the future road networks.

B.2 Land Use

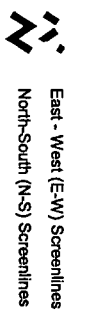
For the modelling work undertaken, population and employment forecasts from the City of Hamilton Official Plan were used along with latest figures from the City of Burlington. Updates to the model to represent the most recent land use expectations of the City were performed. These updates included land use assumptions for:

- ROPA 9 in Glanbrook;
- Stoney Creek Urban Boundary Expansion;
- Setting Sail (downtown Hamilton population and employment review); and
- 1999 Waterdown Master Plan.

The population and employment forecasts assumed for this exercise are shown in **Exhibit B.1**.



**EXHIBIT B.2
SCREENLINE
LOCATIONS**



Scale 1:40000
0 200 400 600 800 1000 1200 1400 M

City of Hamilton/
City of Burlington



EXHIBIT B.1 Population and Employment Forecasts

Municipality/ Area	Population			Employment		
	2001	2006	2021	2001	2006	2021
Lower Hamilton	186,800	185,300	186,100	142,100	145,200	155,000
Upper Hamilton	148,000	144,250	155,150	35,800	39,600	46,300
Stoney Creek	62,450	65,700	98,900	22,200	22,750	30,000
Glanbrook	11,875	16,650	31,100	2,000	7,250	16,950
Dundas	23,400	23,800	25,450	6,000	9,300	10,050
Ancaster	28,500	32,900	43,800	8,050	9,500	12,000
Flamborough	36,800	40,700	52,800	13,200	11,450	15,800
Burlington	160,100	169,000	187,100	68,400	88,000	100,500
<i>Total</i>	<i>658,000</i>	<i>678,250</i>	<i>780,250</i>	<i>297,600</i>	<i>333,000</i>	<i>386,500</i>

B.3 Future Transportation Network Assumptions

Based on discussions with City and MTO staff, the following long-term network additions were considered most likely to be implemented within the 20-year time horizon of the study:

- QEW widening 6 to 8 lanes (10 to 20 year time period);
- Highway 403, widening from 6 to 8 lanes west of Freeman Interchange to Main Street, widening from 5 to 7 lanes from Main Street to Lincoln Alexander Parkway (10 to 20 year time period);
- Highway 6 widening south of Hwy. 5/Dundas Street (5-10 year time period);
- Highway 6/Dundas Street/Hwy. 5 grade separated interchange (10 to 20 year time period);
- Waterdown Road widening to 4 lanes south of Highway 403 (5 to 10 year time period);
- Highway 403/Waterdown Road interchange improvements (5 to 10 year time period); and
- Red Hill Creek Expressway (5 to 10 year time period).

B.4 Assessment

B.4.1 PM Peak Adjustment

The City's demand forecasting model is based on the morning peak hour. Because the model is built on trip generation rates associated with population and employment, this time period is typically modelled with a higher degree of confidence. Morning peak hour traffic is less affected by personal, non-home based purpose trips than the PM peak hour. However, as discussed in Section 3.1, traffic activity in the study area is significantly higher in the afternoon peak hour than the morning peak hour.

In order to assess the network capacity needs in the study area, an adjustment was made to the screenline volumes derived from the model. Most recent traffic count information indicates that PM peak hour, peak direction volumes on Dundas Street and Highway 6 are 29% higher than the AM peak hour, peak direction volumes. For Highway 403, peak direction volumes in the morning and afternoon peak hours are not significantly different.

For comparison, a review of the Transportation Tomorrow Survey trip matrix information for auto travel in the GTA revealed the following:

- in the TTS survey area, afternoon peak hour trips are 16% higher than in the morning;
- in the GTA as a whole, the afternoon peak hour trips are 9% higher than the morning peak hour trips;
- the number of trips destined to the Cities of Hamilton and Burlington is 23% higher in the afternoon peak hour; and
- the number of trips destined to Hamilton/Burlington in the afternoon is 31% more than the number of trips leaving Hamilton Burlington in the morning.

This last comparison is consistent with the observed count information. Given this finding, the AM peak hour screenline volumes were adjusted by a factor of 1.29 to reflect the afternoon peak hour conditions. For Highway 403 a factor of 1.00 was maintained, as experience indicates that this facility operates at or near capacity on both the morning and afternoon peak periods.

B.4.2 Screenlines

A "screenline" is an imaginary or real boundary that defines a broad corridor through which traffic flows. The screenline may represent one road link or several road links. Six major screenlines were used to analyse east-west and north-south travel through the analysis area with respect to the volume forecasts versus the capacity of the roadway links crossing the screenline. The peak hour capacities used in the analysis correspond to those in the model. The screenlines used for analysis purposes were as follows:

- *East of Highway 6:* a north-south screenline identifying east-west travel demands, located immediately east of and parallel to Highway 6 between Parkside Drive and Plains Road;
- *East of Waterdown Road:* a north-south screenline identifying east-west travel demands, located immediately east of and parallel to Waterdown Road between Parkside Drive and Plains Road;
- *East of King Road:* a north-south screenline identifying east-west travel demands, located immediately east of and parallel to King Road between Parkside Drive and Plains Road;
- *South of Dundas Street:* an east-west screenline identifying north-south travel demands, located immediately south of and parallel to Dundas Street between Highway 6 and Brant Street;
- *North of Highway 403:* an east-west screenline identifying north-south travel demands, located immediately north of and parallel to Highway 403 between Highway 6 and Brant Street;
- *South of Highway 403:* an east-west screenline identifying north-south travel demands, located immediately south of and parallel to Highway 403 between Highway 6 and Brant Street;

See **Exhibit B.2** for the location of the screenlines.

B.4.3 Model Validation

The model is a virtual representation of the transportation network in the City of Hamilton and parts of Burlington. To ensure that this representation is reasonably calibrated, the 1996 AM peak hour volumes produced by the model were validated against observed 1996 AM peak hour volumes across 6 screenlines. The results of the model validation are summarized in **Exhibit B.3**.

EXHIBIT B.3 - MODEL CALIBRATION

Screenline	Northbound/Eastbound			Southbound/Westbound		
	Observed	Model	Diff	Observed	Model	Diff
East-West Screenlines						
1. East of Highway 6	5,443	5,916	1.09	4,045	5,475	1.35
2. East of Waterdown Road	6,718	6,469	0.96	5,014	5,601	1.12
3. West of Brant Street	6,635	6,673	1.01	4,530	5,941	1.31
North-South Screenlines						
4. South of Highway 5	2,650	2,108	0.80	2,390	2,705	1.13
5. North of Highway 403	2,120	2,674	1.26	3,360	3,719	1.11
6. South of Highway 403	680	737	1.08	860	458	0.53

The model was generally found to be calibrated within the limits typical of regional travel demand forecasting models at a screenline level of detail. Peak direction flows are calibrated to within 10-15%. Those screenlines showing more than this variance are either off peak direction flow or low volume flow where the actual volume difference is not significant. It was concluded that the model could be used as a tool to forecast future traffic volumes for the purpose of testing a range of roadway improvement options with a reasonable degree of confidence.

B.5 Alternative Testing

In order to test the implications of the Niagara-GTA Corridor, travel demand forecasts for the 2021 AM peak hour were developed for several Niagara-GTA Corridor network and land use scenarios. These scenarios were as follows:

- *2021 Base Network with OPA 28 development* - existing road network plus committed horizon year road infrastructure improvements.
- *2021 Improved Network* – Base network scenario with additional north-south and east-west capacity through Waterdown.
- *2021 Niagara-GTA Corridor Alternative C* – Improved network above with Niagara-GTA Corridor connection to Highway 407.
- *2021 Niagara-GTA Corridor Alternative F* – Improved network above with Niagara-GTA Corridor connection to Highway 401.
- *2021 Niagara-GTA Corridor Alternative G* – Improved network above with additional widening of Highway 403 between Niagara-GTA Corridor interchange and Freeman Interchange.
- *2021 Niagara-GTA Corridor Alternative H* – Improved network above with new Niagara-GTA Corridor east of Highway 6, a widened Highway 6 between new

terminus and Highway 403, and a widened Highway 403 between Highway 6 and Freeman Interchange.

It should be noted that the Niagara-GTA Corridor alternatives were modelled without tolls in order to examine the maximum likely diversion from the local road system.

Results

The screenline demands were reviewed to determine the performance of the network from a volume to capacity perspective. **Exhibit B.4** provides a summary of the forecast screenline demands and the anticipated capacity requirements for each of the scenarios tested.

The following is a summary of the effects and impacts of the introduction of new north-south and east-west capacity through Waterdown, relative to the Base Network, and the Niagara-GTA Corridor, relative to the Improved Network, on the network in the Waterdown Study Area:

Base Network

Long term capacity problems were identified on screenlines east of Highway 6, east of Waterdown Road, East of King Road, South of Dundas Street and north of Highway 403.

A review of the arterial road network revealed capacity deficiencies east of Highway 6, east of King Road and north of Highway 403,

Improved Network

From a screenline perspective, provision of additional east-west and north-south capacity in the Study Area resolves capacity issues east of Waterdown. Capacity deficiencies are forecast for screenlines east of Highway 6, east of King Road, south of Dundas Street and north of Highway 403.

A review of the arterial road network only reveals that capacity deficiencies on the arterials are forecast east of King Road and north of Highway 403.

Niagara-GTA Corridor Alternative C

Although provision of a 4-lane Niagara-GTA Corridor facility addresses capacity requirements from a screenline perspective, deficiencies are forecasts for the arterial road network east of King Road and north of Highway 403.

With respect to travel patterns in the study area the following observations are made with related to the impact of the Niagara-GTA Corridor:

- Significantly lower use of new east-west capacity;
- Significant increase in Dundas Street volume east of Highway 6 as a result of revised connections at Highway. Turning movements at the new east-west route/Highway 6 intersection would be restricted because of the proximity to the potential future Highway 6/ Niagara-GTA Corridor interchange. These restrictions would result in Waterdown-based traffic using Dundas Street as the primary route for accessing Highway 6 north and south rather than a new east-west route connection with Highway 6;



EXHIBIT B.4
Screenline Deficiency Analysis - Peak Direction Volume
2021 P.M. Peak Hour Conditions

Screenline	Base Network		Base Network w/ Study Area Improvements		Base w/ Improvements and MPTC Alternative C		Base w/ Improvements and MPTC Alternative F		Base w/ Improvements and MPTC Alternative G		Base w/ Improvements and MPTC Alternative H	
	All Facilities	Excluding 403/6 [1]	All Facilities	Excluding 403/6 [1]	All Facilities	Excluding MPTC/403/6 [1]	All Facilities	Excluding MPTC/403/6 [1]	All Facilities	Excluding MPTC/403/6 [1]	All Facilities	Excluding MPTC/403/6 [1]
East of Highway 6	11,400	2,900	11,900	3,400	12,000	2,900	11,500	3,100	12,300	2,800	12,000	2,806
(Peak Direction is EB)	9,400	2,900	10,100	3,600	13,000	3,300	10,100	3,600	13,400	3,600	13,000	3,300
Deficiency	2,000	-	1,800	(200)	(1,000)	(400)	1,400	(600)	(1,100)	(800)	(1,000)	(500)
Lane Deficiency [2]	3		2	(1)	(2)	(1)	2	(1)	(2)	(1)	(2)	(1)
East of Waterdown Road	11,300	2,900	11,400	3,000	11,900	3,000	11,400	3,000	12,100	2,700	11,700	2,600
(Peak Direction is EB)	10,500	4,000	11,900	5,400	14,800	5,100	11,900	5,400	15,200	5,400	14,800	5,100
Deficiency	800	(1,100)	(500)	(2,400)	(2,900)	(2,100)	(500)	(2,400)	(3,100)	(2,700)	(3,100)	(2,500)
Lane Deficiency [2]	1	(2)	(1)	(3)	(4)	(3)	(1)	(3)	(4)	(3)	(4)	(3)
East of King Road	12,500	5,100	12,300	5,100	13,400	5,000	12,300	5,000	13,100	4,100	13,000	4,500
(Peak Direction is WB)	10,800	4,400	10,800	4,400	14,100	4,400	10,800	4,400	14,100	4,400	14,100	4,400
Deficiency	1,700	700	1,500	700	(700)	600	1,500	600	(1,000)	(800)	(1,100)	100
Lane Deficiency [2]	2	1	2	(1)	(1)	1	2	1	(2)	(1)	(2)	1
South of Dundas St.	6,600	2,400	6,900	2,800	7,200	3,100	6,900	2,800	6,900	2,700	7,200	2,900
(Peak Direction is NB)	5,800	2,600	6,500	3,300	6,500	3,300	6,500	3,300	6,500	3,300	6,500	3,300
Deficiency	800	(200)	400	(500)	700	(200)	400	(500)	400	(600)	700	(400)
Lane Deficiency [2]	1	(1)	1	(1)	1	(1)	1	(1)	1	(1)	1	(1)
North of Highway 403	7,700	3,200	8,300	3,800	8,500	4,000	8,200	3,800	8,400	3,800	8,800	3,900
(Peak Direction is NB)	6,000	2,700	6,000	2,700	6,000	2,700	6,000	2,700	6,000	2,700	6,500	3,300
Deficiency	1,700	500	2,300	1,100	2,500	1,300	2,200	1,100	2,400	1,100	2,300	600
Lane Deficiency [2]	2	1	3	2	3	2	3	2	3	2	3	1
South of Highway 403	1,300	1,300	1,500	1,500	1,400	1,400	1,400	1,400	1,500	1,500	1,500	1,500
(Peak Direction is NB)	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Deficiency	(500)	(500)	(300)	(300)	(400)	(400)	(400)	(400)	(300)	(300)	(300)	(300)
Lane Deficiency [2]	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1] - Analysis of screenline exclusive of demand and volume associated with noted freeway facilities.

[2] - Lane deficiency expressed as number of arterial lane(s) required to resolve capacity problem, assuming capacity of 900 vehicles per lane



- Volume on Dundas Street east of King Road not significantly affected. Primarily serving traffic to/from Waterdown. With additional interchange on Niagara-GTA Corridor east of Waterdown, more Waterdown traffic observed using Niagara-GTA Corridor corridor to/from the east, but volumes on Dundas Street not significantly reduced as more long distance trips from west destined to South Burlington use interchange (as a result of the interchange configurations at Niagara-GTA Corridor /Highway 407 interchange and at Freeman Interchange); and
- Minor increase in volume attracted to new north-south capacity in Waterdown.

Niagara-GTA Corridor Alternative F

Provision of a 4-lane facility west of Highway 6 and connecting to the Highway 401 corridor has little effect on the travel demands and the observed need for capacity in the Study Area.

With respect to travel patterns in the study area the following observations are made related to the impact of the Niagara-GTA Corridor:

- No significant impact on volume on Red Route;
- No significant impact on Green Route; and
- No significant impact on volume Dundas Street

Niagara-GTA Corridor Alternative G

Provision of additional capacity on Highway 403 addresses the need for east-west capacity in the Study area, from both a screenline and arterial roadway perspective. It is important to note, however, that although the arterial roadway is forecast to be operating within its capacity by the end of the 20-year horizon, it is anticipated that the arterials will reach capacity within 2 to 3 years of the end of the 20-year study horizon.

With respect to travel patterns in the study area the following observations are made related to the impact of the Niagara-GTA Corridor:

- Minor reduction in volume attracted to new east-west capacity through Waterdown;
- Minor increase in volume attracted to new north-south capacity; and
- Minor decrease in volume on Dundas Street

Niagara-GTA Corridor Alternative H

Although provision of a 4-lane Niagara-GTA Corridor facility addresses capacity requirements from a screenline perspective, deficiencies remain on the arterial road network east of King Road and north of Highway 403.

With respect to travel patterns in the study area the following observations are made related to the impact of the Niagara-GTA Corridor:

- Significantly lower volumes attracted to new east-west capacity through Waterdown;
- Significant increase in Dundas Street volume east of Highway 6 as a result of revised connections at Highway. Turning movements at the new east-west route connection to Highway 6 would be restricted because of the proximity to the potential future Highway 6/ Niagara-GTA Corridor interchange. These restrictions would result in Waterdown based traffic using Dundas Street as the primary route for accessing Highway 6 north and south rather than a new east-west connection with Highway 6.;
- Increase in volume on Highway 6; and

- Minor increase in volume attracted to new north-south capacity.

Conclusions of the Niagara-GTA Corridor Analysis

Based on the results of the strategic forecasting, the following conclusions were reached:

In the long term with the development of OPA 28, the screenlines and arterial road network in the Study Area will have exceeded their capacity.

The addition of new north-south and east-west capacity to the study area road network will provide relief to this congested condition, particularly for the arterial network. However significant screenline capacity deficiencies are forecast to remain, specifically east of King Road and north of Highway 403.

With respect to the Study Area screenlines, Niagara-GTA Corridor alternatives C, G, and H are equally effective at addressing deficiencies at a screenline level. However, even with these Niagara-GTA Corridor alternatives, deficiencies in the arterial roadway network are forecast east of King Road (1 arterial lane) and North of Highway 403 (1-2 arterial lanes).

The Niagara-GTA Corridor alternatives each provide new capacity for interregional trips commuting from Niagara and west Hamilton to the GTA. Alternatives C, G, and H provide east-west capacity into Burlington/Oakville that new east-west capacity within Waterdown cannot provide. Although in some cases, volume attracted to new east-west capacity decreases, it still maintains a local Waterdown role in distributing area development traffic to the adjacent arterial network and alleviates volume pressure on Dundas Street through Waterdown.

It is not anticipated that the Niagara-GTA Corridor will have an impact on the need for improvements to east-west roads in the study area. The two main needs identified are the addition of new east-west capacity in the north of Waterdown and the widening of Dundas Street, east of the connection of this new east-west capacity to Dundas Street, thereby providing continuous new east-west capacity from Hwy. 6 east to Brant Street.

Regardless of the Niagara-GTA Corridor alternative tested, there was little or no reduction in east-west travel on Dundas Street east of the developed area of Waterdown, which means that the Niagara-GTA Corridor and Dundas Street are catering to very different travel patterns.

The Niagara-GTA Corridor is a long-term plan to address long term interregional needs. In the absence of any other initiatives with respect to travel from Hamilton to the GTA, the need for the facility is in the 10 to 20 year time frame. Plans to address identified arterial road deficiencies as a result of proposed development in Waterdown and Aldershot will not be effected by the Niagara-GTA Corridor, regardless of the alignment chosen.

APPENDIX C

**SUMMARY OF GOVERNMENT AGENCY/UTILITIES
COMMENTS AND CONCERNS**



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
1.	Bell Canada 20 Hunter St. W. Hamilton, Ontario L8P 1P8	Ms. Pat Friend Co-ordinator	<ul style="list-style-type: none"> No response to date.
2.	Canadian Pacific Railway 36 North Queen Street Etobicoke, Ontario M8Z 2X4	NA	<ul style="list-style-type: none"> No response to date.
3.	Canadian Transportation Agency 15 Eddy Street Hull, Quebec K1A 0N9	NA	<ul style="list-style-type: none"> No response to date.
4.	City of Hamilton Planning & Development 71 Main Street West Hamilton, Ontario L8P 4Y5	Mr. Paul Mason Director, Long Range Planning	<ul style="list-style-type: none"> No response to date.
5.	City of Hamilton Planning & Development 71 Main St. W. Hamilton, Ontario L8P 4Y5	Mr. Tim McCabe Director of Development	<ul style="list-style-type: none"> No response to date.
6.	City of Hamilton Economic Development 1 James St. S., 8th Floor Hamilton, Ontario L8P 4R5	Mr. Neil Everson Executive Director	<ul style="list-style-type: none"> No response to date.
7.	City of Hamilton Public Works Department 2200 Highway 6 South, RR 1 Hamilton, Ontario L0R 1W0	Mr. Don Hull Director of Transit	<ul style="list-style-type: none"> No response to date.
8.	City of Hamilton 71 Main Street West Hamilton, Ontario L8P 4Y5	Mr. David Cuming East Office - Stoney Creek	<ul style="list-style-type: none"> No response to date.



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
9.	City of Hamilton Public Health & Community Services 1 Hughson St. N., 5th Floor Hamilton, Ontario L8R 3L5	Ms. Joe-Ann Priel General Manager	<ul style="list-style-type: none"> No response to date.
10.	City of Hamilton Public Health & Community Services 1 Hughson St. N., 4th Floor Hamilton, Ontario L8R 3L5	Dr. Monir Taha Associate Medical Officer of Health	<ul style="list-style-type: none"> No response to date.
11.	Cogeco Cable Inc. 695 Lawrence Rd. Hamilton, Ontario L8K 6P1	Mr. Astle Walker	<ul style="list-style-type: none"> No response to date.
12.	Conservation Halton 2596 Britannia Road West R.R. #2 Milton, Ontario L9T 2X6	Ms. Jennifer Lawrence Co-ordinator, Environmental Planning Watershed Planning Services	<ul style="list-style-type: none"> July 8, 2003 letter. Cited plans and initiatives that could affect previous recommendations: North Shore Watershed Study: a portion of the study area is in the Aldershot/Waterdown project area and recommendations should be considered (expects to release draft in Fall 2003). Mid-Peninsula Transportation Corridor EA: it would premature to identify a preferred alternative for the Aldershot/Waterdown study until such time as issues pertaining to the Study Area, Terms of Reference and potential corridors for this provincial initiative have been resolved. Previous concerns with potential impacts to Provincially Significant Wetlands and Regional Storm flood Plain of Grindstone Creek associated with any east-west route north of Parkside Drive are reiterated. Mid-Peninsula route may also preclude the need for a north-south alignment (based on concern for cut through the Niagara Escarpment). It is also essential that an all-transit scenario be considered as part of the Aldershot/Waterdown EA. Smart Growth: cites Central Ontario Smart Growth Panel recommendations pertaining to preservation of natural heritage features, agricultural land and unique features (Niagara Escarpment); and investment in new transit initiatives. Waterdown Road/Highway 403 Interchange EA: King Road



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
			<p>corridor should be reassessed in light of the City of Burlington's tentatively preferred interchange location at Waterdown Road. Does not express support for any north-south corridor improvements based on concerns over potential impacts on Sassafras Woods ESA, ANSI and Carolinian Canada Site.</p> <ul style="list-style-type: none"> • 1999 comments and Board of Directors' resolution remain valid. • In summary, the Authority does not support the preferred east-west alignment identified in 1999 and the Recommended Alternative needs to be revisited based on the directions and results of pending studies by other jurisdictions.
			<ul style="list-style-type: none"> • August 8, 2003 letter • provide fisheries information compiled since 1999. • Questioned whether 1999 report incorporated findings of the Grindstone Creek Watershed Study (CH, 1998). • Recommended that terrestrial assessments completed by the City of Burlington for the Waterdown Road Interchange EA be incorporated in the Aldershot/Waterdown update. • Advised that CH has completed little in the way of terrestrial updates north of Highway 403. Will forward tree inventory work when it becomes available. • Halton Natural Areas Inventory Project began field work in Summer 2003 and will provide to Aldershot/Waterdown team on request, when it becomes available.
13.	<p>Enbridge Pipelines Inc. 801 Upper Canada Drive P.O. Box 128 Samia, Ontario N7T 7H8</p>	<p>Ms. Ann Newman, CET Crossings Co-ordinator, Eastern Region</p>	<ul style="list-style-type: none"> • July 8, 2003 letter. • Operates up to three pipelines in Burlington/Flamborough area. • No objections at this time but would like the opportunity to review any proposed work on or near the Enbridge right-of-way. • Provided guidelines for development around their right-of-way and contacts for locates/site meetings.
14.	<p>Environment Canada</p>	<p>Mr. Mike Shaw EA Projects Officer</p>	<ul style="list-style-type: none"> • No response to date.
15.	<p>Fisheries & Oceans Canada Habitat Mgmt. & Enhancement Division 3027 Harvester Rd., Suite 302 Burlington, Ontario L7N 3G7</p>	<p>NA</p>	<ul style="list-style-type: none"> • No response to date.





SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
16.	Fisheries & Oceans Canada Navigation Protection Program 3027 Harvester Rd., Suite 302 Burlington, Ontario L7N 3G7	NA	<ul style="list-style-type: none"> No response to date.
17.	Halton Region 1151 Bronte Road Oakville, Ontario L6M 3L1	Municipal Clerk	<ul style="list-style-type: none"> No response to date.
18.	Hamilton Conservation Authority P.O. Box 7099 838 Mineral Springs Road Ancaster, Ontario L9G 3L3	Ms. Janet Wong Environmental Planner	<ul style="list-style-type: none"> July 15, 2003 letter. Their jurisdiction is west of Centre Road. No changes in Provincial Policy Statement that may affect project. Provided information on woodlots north of Borer's Creek identified as Parkside Drive Woodlot Environmentally Significant Area in City of Hamilton updated Natural Areas Inventory (2002) – woodlots meet Ecological and Hydrological Function, as well as site specific criteria. This designation has been put on hold pending the results of a consultant study commissioned by area land owners. Provided recommendations from Borer's Creek Subwatershed Plan (2000). Borer's Creek considered to be warmwater to coolwater fish habitat (Fisheries Management Plan for entire jurisdiction is being completed). Provided a copy of the Authority's September 7, 1999 comments. Do not support an alignment north of Borer's Creek.
19.	Hamilton-Wentworth District Catholic School Board 90 Mulberry Street, P.O. Box 2012 Hamilton, Ontario L8N 3R9	Mr. Michael Costelloe Acting Controller of Plant	<ul style="list-style-type: none"> July 10, 2003 letter. Since 1999, the Board has opened Guardian Angels Catholic Elementary School, located approximately 1 km north of Parkside Drive on the west side of Centre Road (705 Centre Road). Recommends that the bypass route be located north of the school in order that the school and adjacent church property can be included in the future Waterdown urban area and be serviced by municipal water and sewer. Also some suggestion that the bypass may create a barrier to student pedestrian travel along Centre Road (70% of student population resides in Waterdown and uses sidewalk constructed between Parkside Drive and the school as a condition of approval).



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
20.	Hamilton District School Board P.O. Box 2558 100 Main St. W. Hamilton, Ontario L8N 3L1	Dr. J. Murray	<ul style="list-style-type: none"> No response to date.
21.	Hamilton Emergency Services 55 King William Street Hamilton, Ontario L8R 1A2	Mr. Glen Peace General Manger, Emergency Services	<ul style="list-style-type: none"> No response to date.
22.	Hamilton Police Services 155 King William St., Box 1060, LCD1 Hamilton, Ontario L8N 4C1	Mr. Kenneth Robertson Chief of Police	<ul style="list-style-type: none"> No response to date.
23.	Hamilton Utilities Corporation Box 2249, Stn. LCD1 Hamilton, Ontario L8N 3E4	Mr. Art Leitch President & CEO	<ul style="list-style-type: none"> July 9, 2003 letter. No concerns at this time. Expect that issues regarding any required relocation of existing distribution plant will be addressed at the design stage. Comments provided by M. Cananzi, President, Hamilton Hydro Inc. No response to date.
24.	Hydro One 40 Olympic Drive Dundas, Ontario L9H 7P5	Ms. Carol Christie	<ul style="list-style-type: none"> No response to date.
25.	Imperial Oil Products & Chemical Division 100 - 5th Concession Rd. E. Waterdown, Ontario L0R 2H1	Ms. Colleen Mitchell Right-of-Way Co-ordinator	<ul style="list-style-type: none"> July 7, 2003 letter. Imperial Oil does have a system of oil product pipelines in the area. The route of the Sarnia Products Line has not been modified since 1999 and the company has no plans to alter it. Please maintain contact on this project in order to facilitate control of activities in pipeline corridor and prevent damage or interference.
26.	Ministry of Agriculture & Food Wellington Place RR#1, Fergus, Ontario N1M 2W3	Ms. Carol Neumann Rural Planner	<ul style="list-style-type: none"> July 9, 2003 letter. April 24, 1998 comments remain unchanged. In principle, not opposed to project, based on public benefits and the understanding that: <ul style="list-style-type: none"> any impact on prime agricultural lands will be avoided or, if unavoidable, minimized to the greatest extent possible; and any impacts on agriculturally related infrastructure such as tile drains, drainage outlets and field entrances will be avoided or, if unavoidable, minimized to the greatest extent possible.



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
27.	Ministry of Culture 119 King St. W., 14th Floor Hamilton, Ontario L8P 4Y7	<ul style="list-style-type: none"> • If establishing a detour route, the needs of the local farm community should be considered. • Offered soils, soils capability, land use and drainage mapping. • Requested to be kept informed of study progress.
28.	Ms. Karen Daniels, Consultant Hamilton District Office, Central Area	<ul style="list-style-type: none"> • July 17, 2003 letter. • No comments to make at this time but may wish to provide comment on any report on heritage resources. • For this review and comment, contact Mr. Michael Johnson (see contact below).
28.	Ms. Barbara Ryter Environmental Assessment and Planning Coordinator Air Pesticides and Environmental Planning	<ul style="list-style-type: none"> • August 5, 2003 letter • Reviewed Volume 1 of 1999 Stantec Report. • There have been no changes in pertinent MOE policies, plans, actions or initiatives that would have a bearing on the recommendations made in the Master Plan report. • Expects that Class EA process will be adhered to throughout all phases of planning and evaluation of the undertaking. • Also expect incorporation of best management practices into the design to minimize environmental impacts. • There did not appear to be any outstanding concerns or issues expressed in Volume 1 of the report.
29.	Ministry of Municipal Affairs & Housing 777 Bay St., 7th Floor Toronto, Ontario M5G 2E5	<ul style="list-style-type: none"> • NA
30.	Ministry of Natural Resources Guelph District Office 1 Stone Rd. W. Guelph, Ontario N1G 4Y2	<ul style="list-style-type: none"> • No response to date.
31.	Ministry of Tourism, and Recreation 400 University Ave., 4th Floor Toronto, Ontario M7A 2R9	<ul style="list-style-type: none"> • No response to date.



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
32.	Ministry of Transportation 1201 Wilson Ave., Bldg. D., 4 th Floor Downsview, Ontario M4V 1L5	Ms. Pauline Van Roon, P.Eng. Highway Engineering Hamilton	<ul style="list-style-type: none"> July 2, 2003 letter. Concerns remain with the proposed routes that will affect the Ministry's highway system. Impacts, with and without the route in place, should be determined for all provincial highways in the vicinity (Highways 5, 6 and 403). MTO input to the City of Burlington's Highway 403/Waterdown Road Interchange study should be included. The Ministry will be very concerned if an additional interchange is proposed on Highway 403 to accommodate the north-south leg of the bypass route. It will be necessary for MTO to review all proposed crossings of the Highway 403 corridor.
33.	National Heritage Information Centre 300 Water Street, P.O. Box 7000 2nd Floor, North Tower Peterborough, Ontario K9J 8M5	NA	
34.	Niagara Escarpment Commission 232A Guelph Street Georgetown, Ontario L7G 4B1	Ms. Marion Plaunt Senior Strategic Advisor	<ul style="list-style-type: none"> July 2, 2003 letter Comments made in the context of road network improvements made or proposed since 1999 (Highway 407, Highway 5, Highway 6, Mid-Peninsula Corridor). Effects of new improvements should be monitored in terms of impacts on both north-south and east-west routes, with a view to revisiting the need and justification for an improved north-south crossing of the Niagara Escarpment. Until this justification is confirmed, it is premature to consider the details of improvements to the King Road corridor August 19, 1999 comments remain valid and will have to be addressed (directing traffic to Highway 6 and Brant Street; creating an attractive transit-based alternative, including enhanced connections to Waterdown GO Station). Consider directing traffic from lands south of Highway 5 to the Highway 5 corridor for connection to Highways 6, 407, 401 and QEW by reconfiguring major collector road links (internal subdivision roads, Mountain Brow Road). March 1, 2004 letter Further to our meeting: "there appears to be sufficient rationale to expect a need to improve transportation infrastructure within the study area".



SUMMARY OF GOVERNMENT AGENCY/UTILITIES COMMENTS AND CONCERNS

	AGENCY	CONTACT/RESPONDENT	COMMENT/CONCERN
35.	Ontario Provincial Police Burlington Detachment 1160 North Shore Boulevard East P.O. Box 5021, Station A Burlington, Ontario L7R 3	Staff Sgt. J. R. Weekes, Detachment Cdr.	<ul style="list-style-type: none"> • More work will be done to clarify the level of improvements required for North/South improvements. • Next phase of the Master Transportation Study will identify the opportunities and options (including transit) to address the identified needs. • Opportunities that minimize impacts on natural and visual Escarpment environment will be addressed through the next phase. • No response to date.
36.	Royal Botanical Gardens 680 Plains Rd. W. Burlington, Ontario L7T 4H4	Mr. Tys Theysmeyer	<ul style="list-style-type: none"> • No response to date.
37.	Sun Canadian Pipeline P.O. Box 470 830 Highway 6 North Waterdown, Ontario L0R 2H0	Mr. Paul Lane	<ul style="list-style-type: none"> • No response to date.
38.	Union Gas Box 10, 360 Strathearne Ave. N. Hamilton, Ontario L8N 3A5	Mr. Enzo Greco Mapping Supervisor	<ul style="list-style-type: none"> • No response to date.



Parkside Drive Woodlot (FLAM 128) - Ward 15

Site Summary

Parkside Drive Woodlot consists of seven distinct vegetation communities along the headwaters of Borer's Creek. The site is important because of the diversity of communities present, including upland mixed forests, a conifer plantation, deciduous swamp, and meadow marsh. The site is found along Parkside Drive, north of Waterdown in Flamborough. The water table throughout the site is high, indicating that this is a significant groundwater recharge area. This large site (94 hectares) also contains a small amount of interior forest habitat, which is particularly important because it is adjacent to the Waterdown urban area.

ESA Criteria

- Significant Ecological Function
 - the woodlot provides a forested riparian corridor, connecting Millgrove South Woodlot ESA (FLAM 45) to Waterdown North Wetlands ESA (FLAM 47). The site is linked to neighbouring greenspaces by hedgerows.
 - there is also interior forest habitat (100-200 meters from edge) present
 - it provides habitat for two plants that are rare in the City of Hamilton (see Species List below).
 - the site exhibits a high diversity of biotic features (at least 7 different Ecological Land Classification plant community types) relative to its size. In this report, a site that contains 4 or more ELC plant community types is considered to have high diversity.
- Significant Hydrological Function
 - The site contributes to improved water quality and flood attenuation. The high water table (Ecologistics Ltd. 1976) and underlying and surrounding rapidly draining soils (Grimsby sand loam) indicate that this area could be sensitive to groundwater contamination. The vegetation of the woodlot serves an important hydrological function by filtering water seeping through underlying soils and protecting groundwater quality.

Significant Site Criteria

- The site is locally significant, as a remnant natural area in an intensively urban and agricultural landscape.

Species List

COMMON NAME	SCIENTIFIC NAME	HAM RANK	SRANK (PROV)	GRANK (CAN)
Hairy Woodpecker	<i>Picoides villosus</i>	uncommon	S5	G5
Great Horned Owl	<i>Bubo virginianus</i>	uncommon	S5	G5
Common Sedge	<i>Carex communis</i>	uncommon	S5	G5
Finger Sedge	<i>Carex digitalis</i>	uncommon	S4S5	G5
Cyperus-like Sedge	<i>Carex pseudo-cyperus</i>	uncommon		
Meadow Horsetail	<i>Equisetum pratense</i>	rare	S5	G5

Candidate Environmentally Significant Areas Discussion Paper

COMMON NAME	SCIENTIFIC NAME	HABITAT RANK	SRANK (PROV)	GRANK (CAN)
Woodland Horsetail	<i>Equisetum sylvaticum</i>	uncommon	S5	G5
Ground-pine	<i>Lycopodium obscurum</i>	rare	S4	G5
Canada Gooseberry	<i>Ribes hirtellum</i>	uncommon	S5	G5

Map of Site

Refer to Figure 2.

Recommendation

Parkside Drive Woodlot is recommended as an ESA for inclusion in the Regional Official Plan because it fulfills two of the ESA criteria.

This site has potential for restoration to increase interior forest habitat (fill in jagged edges) and enhance linkages to adjacent habitat.

Figure 2.

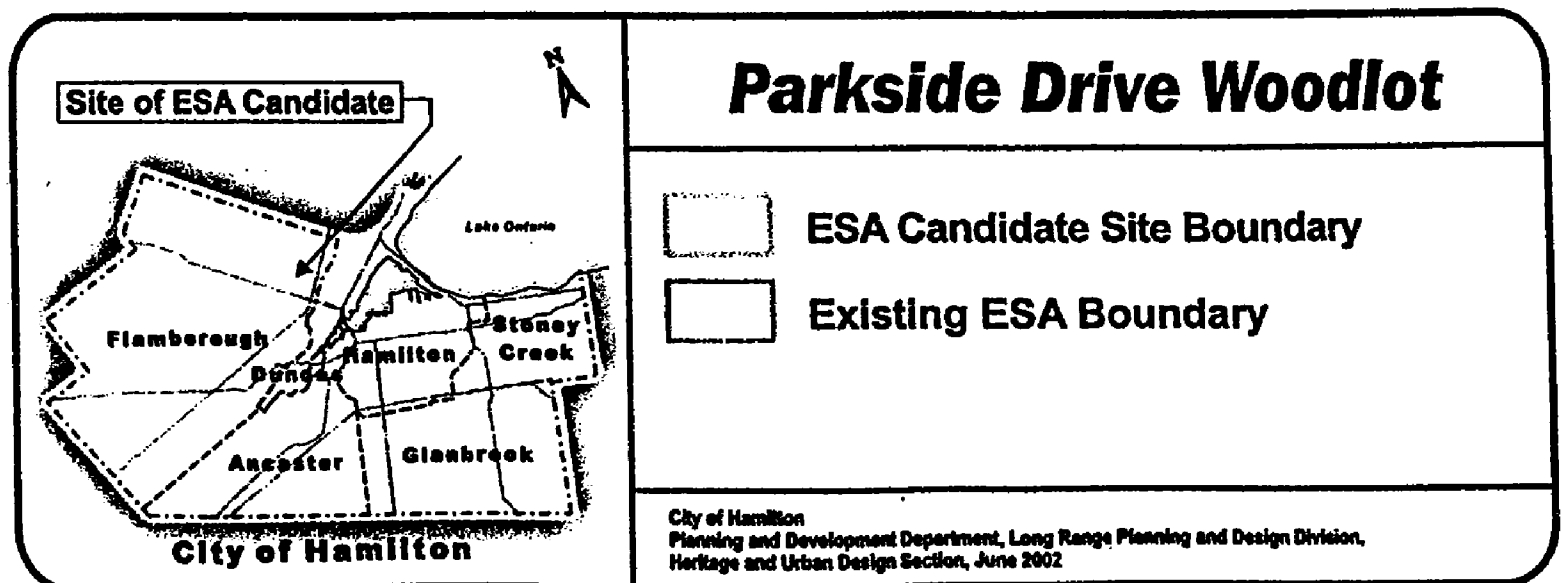


Figure 2.

