

**EMERALD CREEK ESTATES
5450 ALBION ROAD
CITY OF OTTAWA**

TRAFFIC ASSESSMENT

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CONSULTING TRANSPORTATION ENGINEERS

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Prepared for:

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EMERALD CREEK ESTATES CITY OF OTTAWA

1. INTRODUCTION

The developer of the subdivision located at the northwest corner of Albion Road and Mitch Owens Road in the former City of Gloucester has engaged the firm of D. J. Halpenny & Associates Ltd. to conduct a traffic assessment of their development to determine the impact of the expected site generated trips on the operation of the surrounding roadways and intersections. The small size of the development would generate fewer vehicle trips than required for the preparation of a transportation impact study under the guidelines of the *Transportation Impact Study Guidelines, September 1995* publication by the former Regional Municipality of Ottawa-Carleton. To determine the impact of site generated trips, this traffic assessment has examined the expected operation of the site access points and the intersection of Mitch Owens Road and Albion Road after the development of the site. Figure 1.1 shows the location of the proposed development.

1.1 Scope

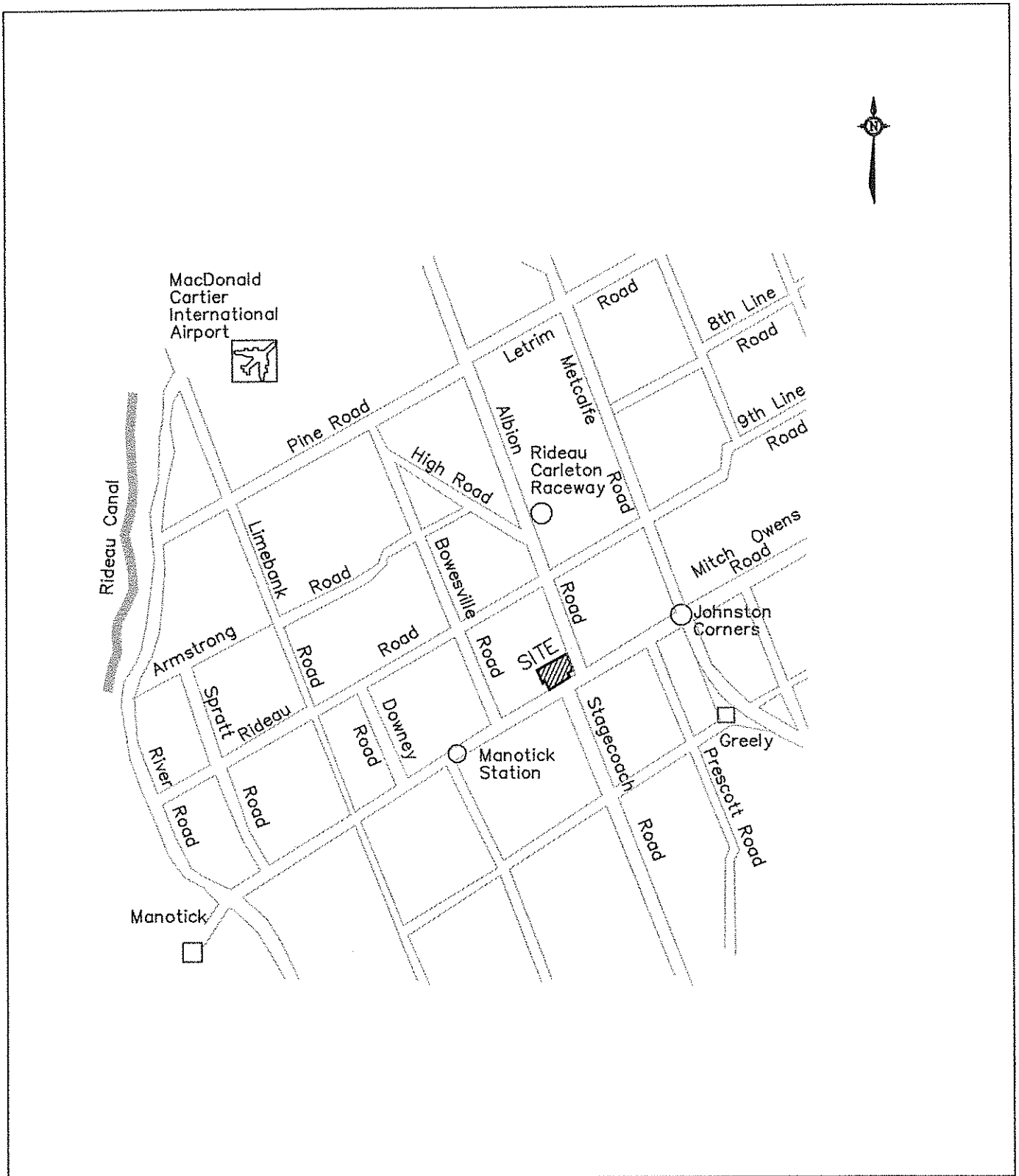
The scope of the study is confined to the operation and geometry of the site access points onto Albion Road, and the operation of the intersection of Mitch Owens Road and Albion Road. The analysis will examine the operation of the roadways and intersections utilizing the most current traffic counts taken on July 27, 2000 by the City of Ottawa. The time period for the analysis will be the peak hour of vehicular traffic which would occur during the weekday peak AM and PM hours on the adjacent roadways.

2. EXISTING ROADWAYS AND INTERSECTIONS

The development is proposed for the vacant lands on the northwest corner of the intersection of Mitch Owens Road and Albion Road. Albion Road (Regional Road 8) is a two lane rural roadway with a posted speed limit of 80 km/h. Mitch Owens Road (Regional Road 25E) is also a two lane arterial roadway with a speed limit of 80 km/h. Traffic counts taken in 2000 at the Mitch Owens/Albion intersection determined that Albion Road past the site carries approximately 3,850 two-way vehicles during an 8 hour period. The 2000 traffic counts along Mitch Owens Road in the vicinity of the site observed an 8 hour count of 6,560 two-way vehicles. There are no cycling lanes along either Albion Road or Mitch Owens Road. There is no transit service provided in the vicinity of the site.

The intersection of Mitch Owens Road and Albion Road is a "T" intersection with Albion Road forming the north approach, and Mitch Owens Road the east and west approaches. The intersection is controlled by a stop sign placed at the Albion Road southbound approach. There

**FIGURE 1.1
SITE LOCATION**



NOT TO SCALE

are no exclusive turn lanes at the intersection. An existing gasoline service station is located at the northwest corner of the intersection.

The City of Ottawa will be modifying the intersection, providing southbound and eastbound left turn lanes with the installation of traffic control signals. Construction is scheduled for the fall of the year 2002.

The most recent traffic counts taken on July 27, 2000 at the intersection of Mitch Owens Road and Albion Road were obtained from the City of Ottawa. Figure 2.1 shows the existing weekday peak AM and PM traffic counts taken at the intersection.

3. PROPOSED DEVELOPMENT

The developer, Emerald Creek Estates, is currently preparing a Site Plan for the development of vacant lands approximately 71.4 hectares in size at the northwest corner of the intersection of Albion Road and Mitch Owens Road in the former City of Gloucester.

The development at 5450 Albion Road comprises of 89 single family homes constructed on estate sized lots. The Site Plan proposes two site access points from Albion Road. The most northerly access (Access No. 1) is located approximately 650 metres north of the Mitch Owens/Albion intersection, and the second (Access No. 2) approximately 310 metres north of the intersection. A conceptual site plan for the development as shown in Figure 3.1.

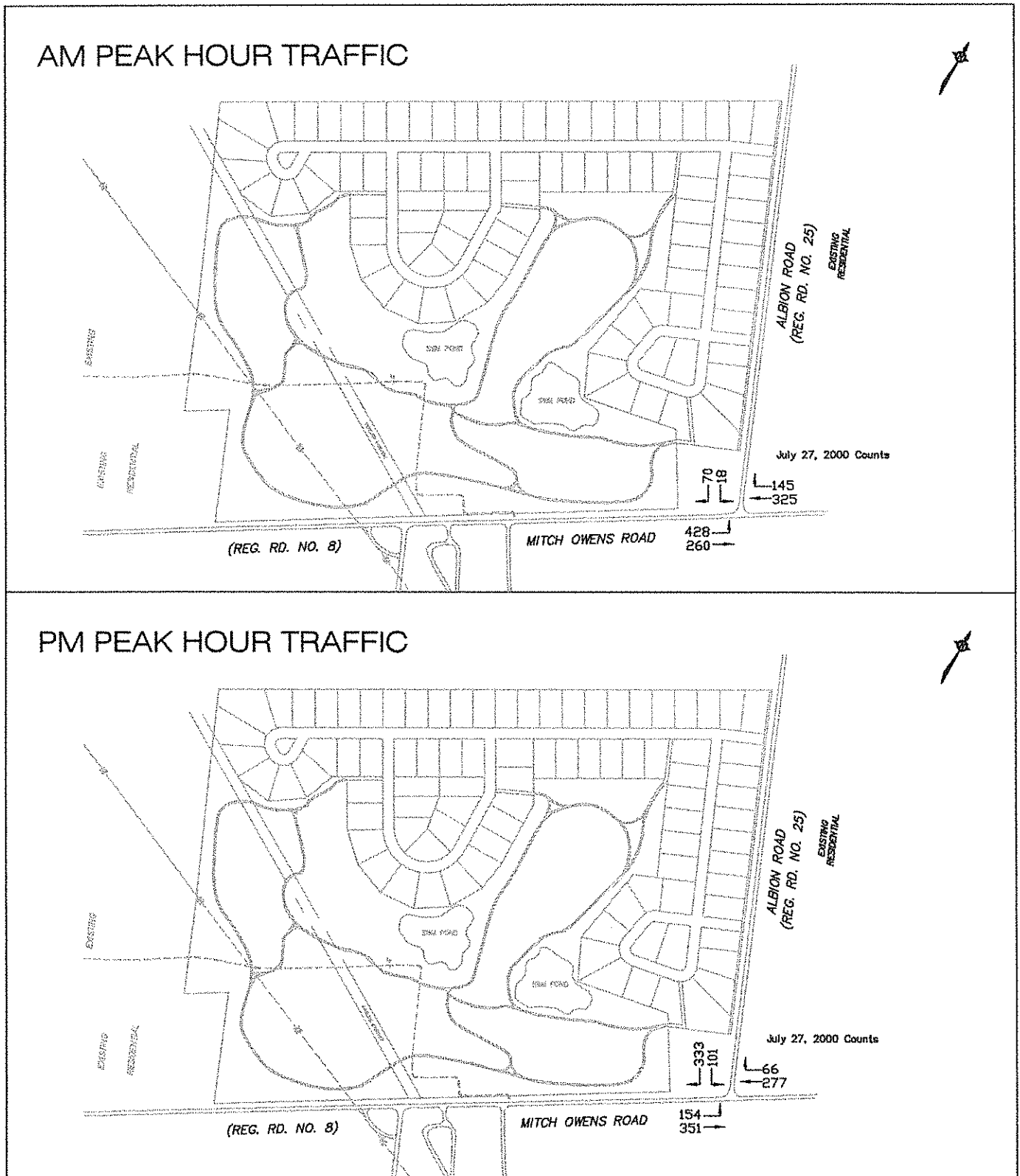
3.1 Trip Generation

The proposed subdivision would consist of 89 single family homes, located on estate size lots. The development would have two access points onto Albion Road. The site generated trips were determined utilizing the document, *TRANS, Trip Generation Manual*. Currently the subdivision is not serviced by OC Transpo. The Trans manual assumes a 25 percent transit ridership in the trip rates. To reflect the lack of transit service in the area, the Trans trip rates were increased to account for all trips by car from the subdivision. Table 3.1 details the expected trips for the weekday peak AM and PM hours.

**TABLE 3.1
 WEEKDAY SITE TRIPS GENERATED**

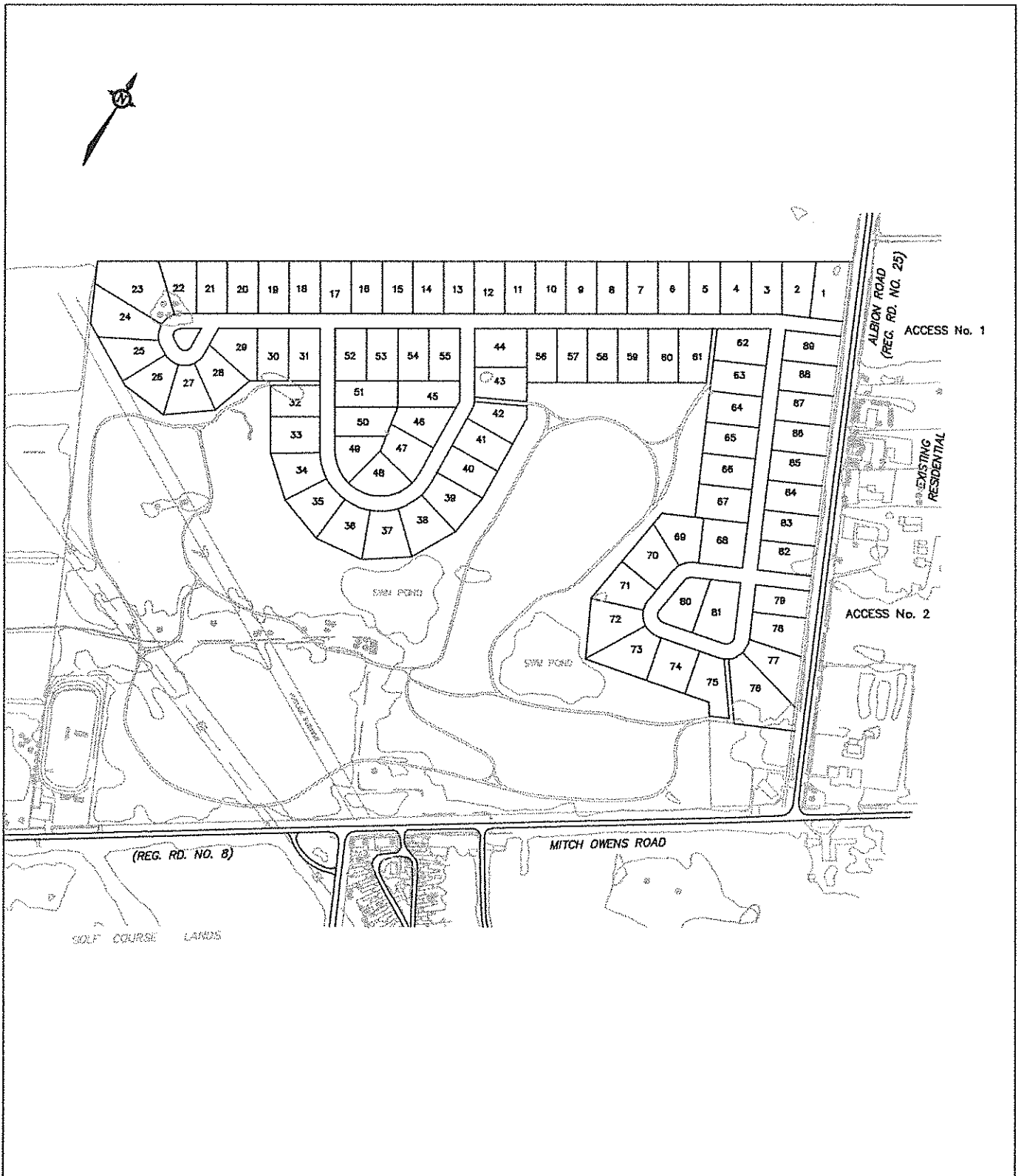
WEEKDAY PEAK AM and PM HOUR								
LAND USE	AM PEAK HOUR				PM PEAK HOUR			
	RATE	TOTAL	ENTER	EXIT	RATE	TOTAL	ENTER	EXIT
89 Single Family	0.8 Trips/Unit	72	18 (25%)	54 (75%)	1.1 Trips/Unit	98	64 (65%)	34 (35%)

FIGURE 2.1
YEAR 2000 TRAFFIC COUNTS



NOT TO SCALE

**FIGURE 3.1
CONCEPTUAL SITE PLAN**



NOT TO SCALE

The site generated trips were distributed onto the roadways utilizing the weekday peak AM and PM hour trip patterns of traffic counted at the Mitch Owens/Albion intersection. The counts determined the following trip distribution which was applied to both the peak AM and PM hour site trips:

To/From the north along Albion Road	85%
To/From the south along Albion Road	15%
To/From the east along Mitch Owens Road	5%
To/From the west along Mitch Owens Road	10%

The above distribution would best represent the peak hour trips of residents in the proposed development. The design of the development further divided the site trips to 80 percent to the north access (Access No. 1) and 20 percent to the south access (Access No. 2). Figure 3.2 shows the expected distribution of site generated trips.

4. TRANSPORTATION IMPACT

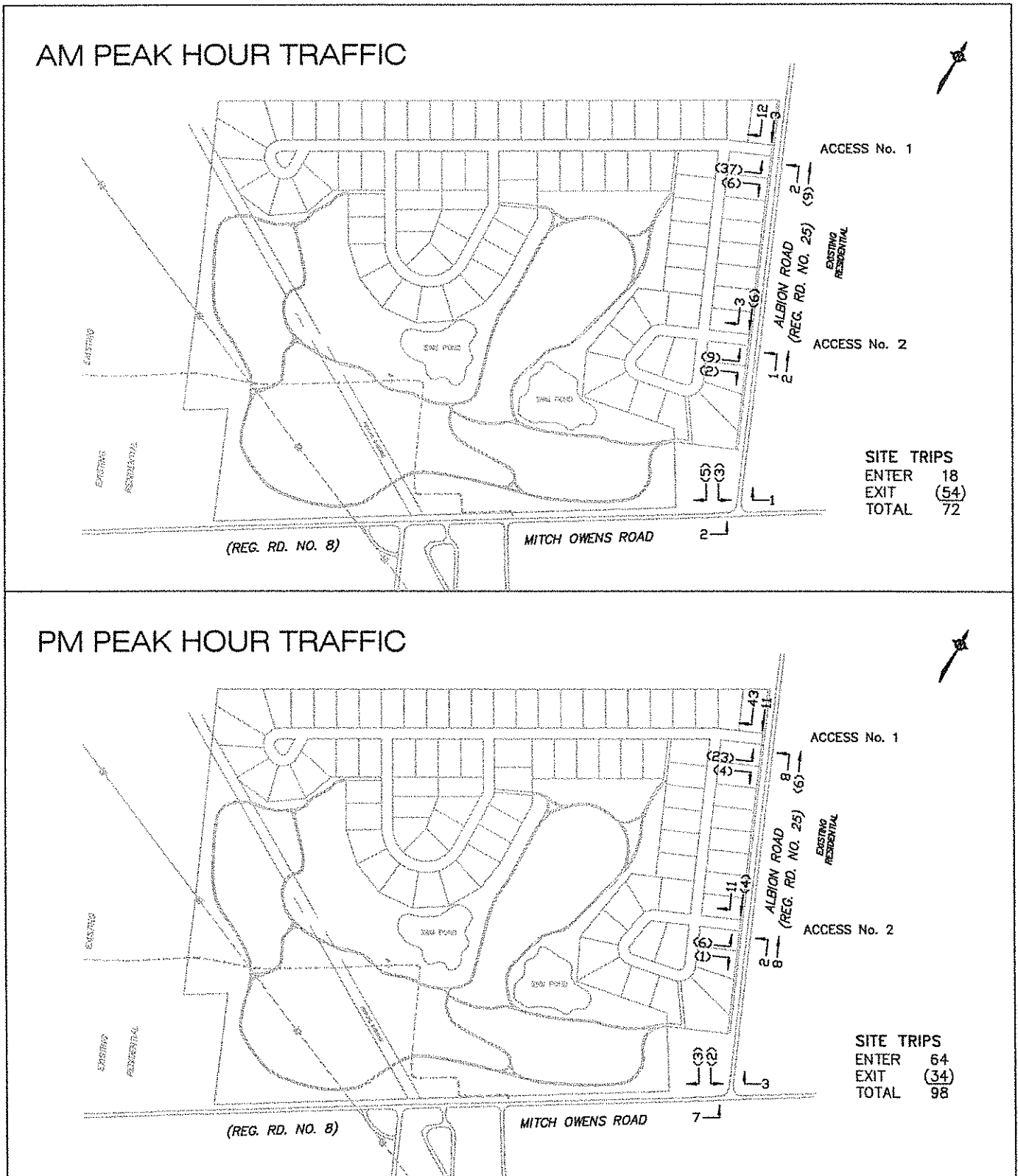
4.1 Total Traffic Volumes

The total traffic volumes at along Mitch Owens Road and Albion Road were determined by the addition of the existing background traffic counts of Figure 2.1 and the site generated trips of Figure 3.2. The result is the weekday peak AM and PM hour total traffic volumes as detailed in Figure 4.1 for the site access points and the Mitch Owen/Albion intersection.

The impact of site generated traffic was studied by conducting an intersection capacity analysis to determine the level of service at the site access points for the total traffic scenario including the site generated trips. The analysis was based on the *Highway Capacity Software, Release 4.1*, which utilizes the intersection capacity analysis procedure as documented in the *2000 Highway Capacity Manual (HCM)*.

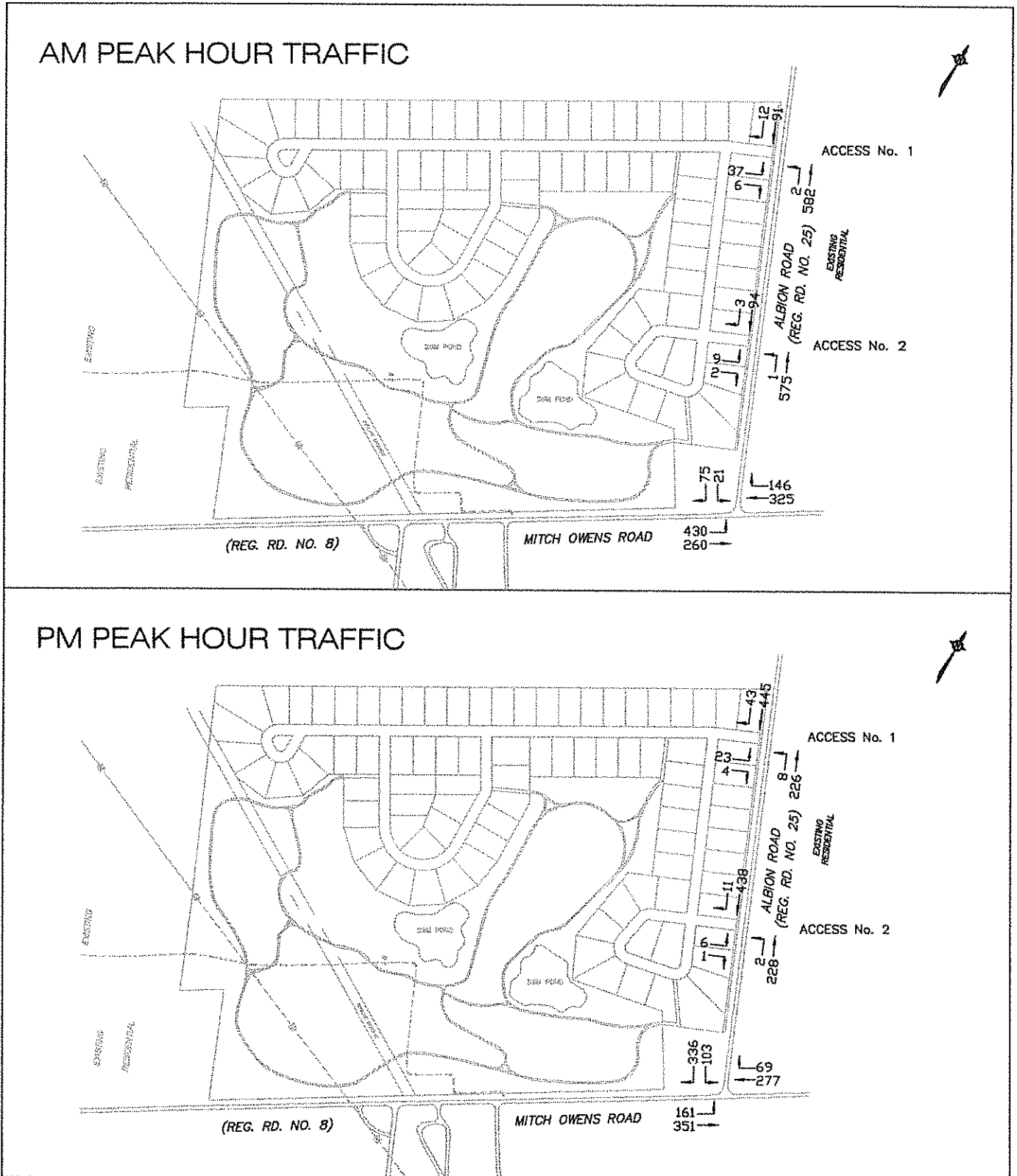
The Site Plan proposes two full movement accesses onto Albion Road. The posted speed limit on Albion Road is 80 km/h. A left turn lane warrant analysis was conducted for the total traffic volumes as presented in Figure 4.1 at Access No. 1, which will experience the higher traffic volumes of the two accesses. The analysis for the peak AM and PM hours utilized the graphs provided in the Ministry of Transportation (MTO) manual, *Geometric Design Standards for Ontario Highways, 1985*. The north access was determined to have 0.3 percent northbound left turn movements during the peak AM hour, and 3.4 percent for the peak PM hour. Utilizing the warrant graphs for a design speed of 100 km/h. (posted speed 80 km/h.), the graph determined that the northbound Albion Road movement at Access No.1 met the warrants for an exclusive left turn lane during the peak AM hour using the 5 percent left turn movement graph (29 left turning vehicles) which is the minimum left turn movement graph. Since the expected peak AM left turn movement was 2 vehicles as shown in Figure 4.1, it is concluded that the left turning volumes do not warrant a standard left turn lane, but are sufficient due to the high volume of

**FIGURE 3.2
 SITE GENERATED TRIPS**



NOT TO SCALE

**FIGURE 4.1
TOTAL TRAFFIC VOLUMES**



NOT TO SCALE

northbound Albion Road traffic to cause problems for through traffic, therefore a left turn slip around lane is recommended at Access No. 1. The 3.5 metre wide slip around lane would comprise of a 50 metre approach and departure taper, and a 30 metre full width storage lane and 15 metre runout as shown in Figure E9-7 of the manual *Geometric Design Standards for Ontario Highways, 1985*. The left turn lane warrant graph for Access No. 1 is included as Exhibit 1 in the Appendix.

The operation of the two Albion Road site accesses were examined utilizing the procedures of the *2000 Highway Capacity Manual (HCM)* for the access geometry having a shared northbound through/left turn movement. The analysis determined that the northbound Albion Road through/left movement would function at a Level of Service (LoS) "A" during both the peak AM and PM hours. Table 4.1 details the level of service and 95th percentile queue length at the critical movements at Access No. 1 and 2. The 95th percentile queue length is the calculated 95th greatest queue length out of 100 occurrences at a movement during a 15-minute peak period. The 95th percentile queue length is a function of the capacity of a movement and the total expected traffic, with the calculated value determining the magnitude of queue by representing the queue length as fractions of vehicles. The analysis sheets for the capacity analysis are included in the appendix as Exhibit 2 and 3 for Access No.1, and Exhibit 4 and 5 for Access No. 2.

**TABLE 4.1
 INTERSECTION LEVEL OF SERVICE (LoS) & 95th PERCENTILE QUEUE**

INTERSECTION APPROACH	TOTAL TRAFFIC			
	AM		PM	
	LoS	95th Percentile Queue	LoS	95th Percentile Queue
Access No. 1	Stop Control Signs (Eastbound Approach)			
Northbound left	A	0.00	A	0.02
Eastbound left/right	B	0.39	C	0.25
Access No. 2	Stop Control Signs (Eastbound Approach)			
Northbound through/left	A	0.00	A	0.01
Eastbound left/right	B	0.09	B	0.05

The operation of the intersection of Mitch Owens Road and Albion Road was also examined to determine the level of service for the existing year 2000 counts, and with the addition of the expected site trips. Then intersection geometry contains no exclusive left turn lanes, which with the high existing volume (2000 Counts) of traffic yields an AM peak hour LoS "B" for the eastbound Mitch Owens shared through/left turn movement, and a LoS "A" during the peak PM

hour. The southbound Albion shared left/right turn lane would function at a LoS "E" during the peak AM hour and a LoS "F" during the peak PM hour. With the addition of the low volume of site generated traffic from the Emerald Creek development, the intersection would operate at the same level of service as it currently functions. With the proposed intersection modifications by the City of Ottawa which comprise of both exclusive left turn lanes and traffic control signals, the intersection would function at an acceptable level of service with the addition of expected site generated trips.

5. FINDINGS AND CONCLUSIONS

The analysis contained in this report has determined that the proposed Emerald Creek Subdivision would have a minor impact on the operation of Albion Road and the Mitch Owens/Albion intersection. The location of the site access points as shown on the Site Plan would not result in an operational problem along Albion Road.

The traffic assessment of the trips generated from the site resulted in the following conclusions:

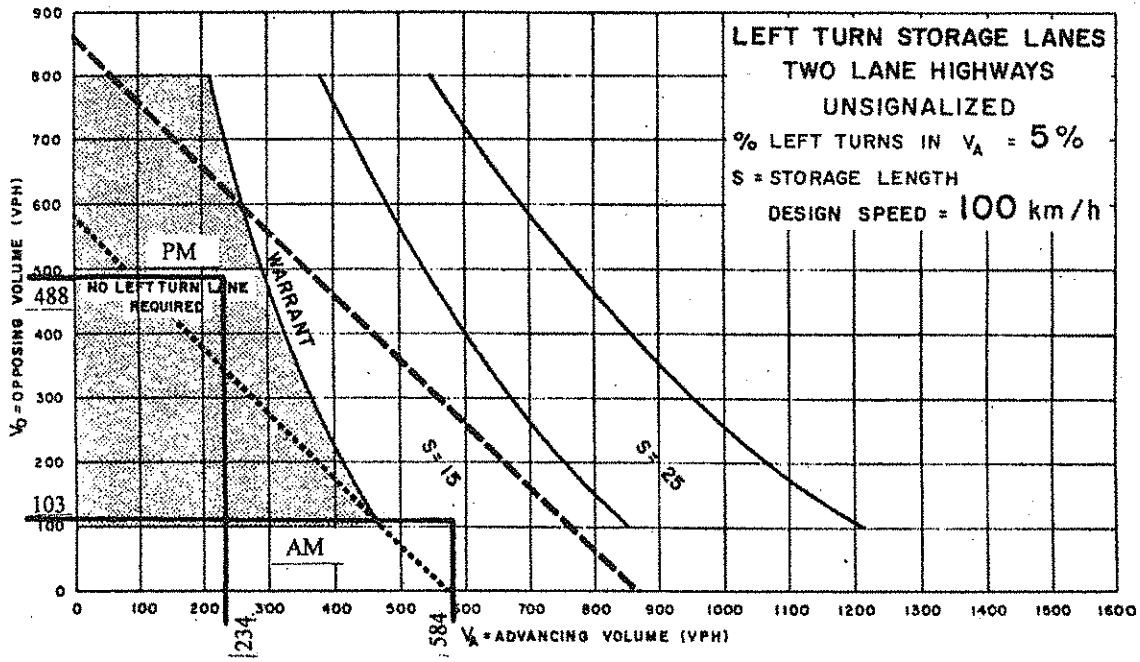
- The traffic expected to be generated from the Emerald Creek Subdivision is less than that required for a transportation impact study under the study guidelines published by the former Regional Municipality of Ottawa-Carleton.
- A left turn lane warrant analysis determined that an exclusive Albion Road northbound left turn lane is not warranted, but that the high volume of Albion Road traffic may cause problems at Access No.1, therefore a northbound left turn slip around lane on Albion Road is recommended at Access No. 1.
- The traffic movements at Access No. 2 were determined to be low and would not require an exclusive northbound left turn lane.
- The eastbound site approaches at Access No. 1 and 2 would comprise of a shared left/right turn lane.
- The addition of site generated traffic at the intersection of Mitch Owens Road and Albion Road would have a minor effect, and would not result in a drop in the level of service of the intersection. The intersection is expected to operate at an acceptable level of service after the completion of intersection modifications proposed by the City of Ottawa, which include the installation of traffic control signals and construction of exclusive southbound and eastbound left turn lanes.

APPENDIX

EXHIBIT 1 ACCESS No. 1 - LEFT TURN LANE WARRANT ANALYSIS

AT-GRADE INTERSECTIONS

APPENDIX A



- TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW
- TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

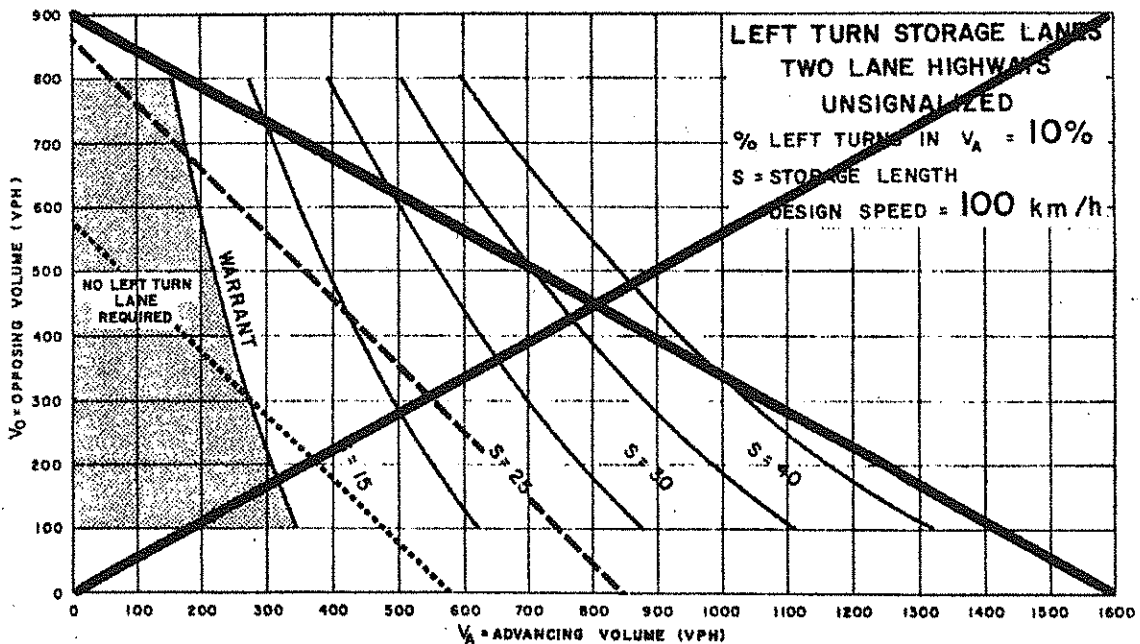


Figure EA-22

EXHIBIT 3
TOTAL PM PEAK HOUR SUMMARY SHEET (Access No. 1)

HCS2000: Unsignalized Intersections Release 4.1b

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
 Intersection: **Access No. 1/Albion**
 Project ID: **Emerald Creek Subdivision**
 East/West Street: **Access No. 1**
 North/South Street: **Albion Road**
 Intersection Orientation: **NS** Study period (hrs): **0.25**

Major Street:	Approach Movement	Vehicle Volumes and Adjustments							
		Northbound				Southbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume		8	226			445	43		
Peak-Hour Factor, PHF		0.90	0.90			0.90	0.90		
Hourly Flow Rate, HFR		8	251			494	47		
Percent Heavy Vehicles		5	--	--		--	--		
Median Type		Undivided							
RT Channelized?									
Lanes		1	1			1	0		
Configuration		L	T				TR		
Upstream Signal?		No				No			

Minor Street:	Approach Movement	Westbound				Eastbound			
		7 L	8 T	9 R	10 L	11 T	12 R		
		Volume					23	4	
Peak Hour Factor, PHF					0.90	0.90			
Hourly Flow Rate, HFR					25	4			
Percent Heavy Vehicles					0	0			
Percent Grade (%)		0				0			
Median Storage									
Flared Approach: Exists?						No			
Storage									
RT Channelized?									
Lanes					0	0			
Configuration						LR			

Approach	Delay, Queue Length, and Level of Service								
	NB	SB	Westbound			Eastbound			
	1	4	7	8	9	10	11	12	
Movement	L								
Lane Config	L						LR		
v (vph)	8						29		
C(m) (vph)	1013						380		
v/c	0.01						0.08		
95% queue length	0.02						0.25		
Control Delay	8.6						15.3		
LOS	A						C		
Approach Delay							15.3		
Approach LOS							C		

EXHIBIT 5 TOTAL PM PEAK HOUR SUMMARY SHEET (Access No. 2)

HCS2000: Unsignalized Intersections Release 4.1b

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
 Intersection: **Access No. 2/Albion**
 Project ID: **Emerald Creek Subdivision**
 East/West Street: **Access No. 2**
 North/South Street: **Albion Road**
 Intersection Orientation: **NS** Study period (hrs): 0.25

		Vehicle Volumes and Adjustments							
Major Street:	Approach Movement	Northbound				Southbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume		2	228			438	11		
Peak-Hour Factor, PHF		0.90	0.90			0.90	0.90		
Hourly Flow Rate, HFR		2	253			486	12		
Percent Heavy Vehicles		5	--	--		--	--		
Median Type		Undivided							
RT Channelized?									
Lanes		0	1			1	0		
Configuration			LT				TR		
Upstream Signal?			No				No		

		Westbound				Eastbound			
Minor Street:	Approach Movement	7	8	9	10	11	12		
		L	T	R	L	T	R		
Volume					6		1		
Peak Hour Factor, PHF					0.90		0.90		
Hourly Flow Rate, HFR					6		1		
Percent Heavy Vehicles					0		0		
Percent Grade (%)			0			0			
Median Storage									
Flared Approach: Exists?						No			
Storage									
RT Channelized?									
Lanes					0		0		
Configuration						LR			

		Delay, Queue Length, and Level of Service							
Approach Movement	Lane Config	NB	SB	Westbound				Eastbound	
		1	4	7	8	9	10	11	12
		LT							LR
v (vph)		2							7
C(m) (vph)		1051							401
v/c		0.00							0.02
95% queue length		0.01							0.05
Control Delay		8.4							14.1
LOS		A							B
Approach Delay									14.1
Approach LOS									B