



BA Group

WATERSAND EMPLOYMENT DRAFT PLAN TRAFFIC STUDY

Salem Secondary Plan Area
City of Barrie

Prepared For: Watersand Construction
c/o DG Group

November, 2016



**MOVEMENT
IN URBAN
ENVIRONMENTS**

BAGROUP.COM

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1.0 EXECUTIVE SUMMARY

Watersand Construction, an affiliate of DG Group, is proposing the development of employment based land uses on a 35.795 hectare property (referred to in this study as the Watersand Employment draft plan) by means of a Draft Plan of Subdivision. The proposed subdivision is located south of McKay Road West, east of Veterans Drive, and west of the Highway 400 corridor in the Salem Secondary Plan area. This secondary plan, along with the Hewitt's Secondary Plan to the east, comprises the "Annexed Lands" located to the south of the City of Barrie.

The primary objective of this study is to test the currently approved and planned City of Barrie road network in the vicinity of the Salem Secondary Plan under a development scenario comprising the Watersand Employment draft plan as well as four Phase 1 residential draft plan developments (the traffic studies for which have previously been submitted) and to identify any necessary road and intersection improvements in the immediate vicinity of the Watersand Employment lands as well as at key arterial intersections that may be impacted.

A secondary objective is to establish how much employment development can be supported on these lands by 2021, that is, prior to the completion of the Harvie Road and Big Bay Point Road crossing of Highway 400 and of the full interchange at McKay Road

As requested by City of Barrie staff, this study also assesses the impact of traffic related to the Phase 1 draft plans on the Maplevue Drive Corridor in the vicinity of Highway 400. This assessment has been undertaken in response to concerns that there are currently capacity limitations with respect to traffic in south Barrie accessing the Highway 400 corridor, as well as crossing the corridor.

Two horizon years have been assessed in this study. The first, 2021, corresponds to the year in which it is anticipated that the Harvie Road and Big Bay Point Road crossing of Highway 400 is completed. This crossing, to the north of the Maplevue Drive interchange, will provide much anticipated relief to the Maplevue Drive corridor by providing an alternative means to cross Highway 400. The traffic assessed in this horizon year, therefore, tests the maximum impact that Phase 1 Salem traffic is anticipated to have on Maplevue Drive before the alternative crossing is completed.

The second year which has been assessed is 2026, which is the year in which it is anticipated that full buildout of the Watersand Employment lands would be completed. Longer term traffic analysis (beyond 2026) has not been conducted as part of this draft plan study. This is in part because the longer term road infrastructure needs for full buildout of the Salem Secondary Plan have already been tested through the City of Barrie's 2014 Multi-modal and Active Transportation Master Plan process. Additionally, completion of the Harvie Road / Big Bay Point Road crossing in 2021 and the McKay Road interchange in about 2022 will have a substantial, and beneficial, impact on the traffic volumes and patterns in south Barrie. It is therefore more appropriate to deal with traffic forecasts in the 2026 to 2031 time frame as part of the Phase 2 and 3 traffic studies

Key results of the analysis conducted in this study are as follows:

1. The currently planned and approved Salem Secondary Plan road network will perform at an adequate level of service



2. Access intersections for the Watersand Employment draft plan will function at a good level of service and do not require additional turning lanes over and above what is ultimately planned as the boundary roads are improved.
3. Development of an estimated about 4.22 hectares of the employment draft plan can be supported by 2021. Beyond this level, impacts at the intersection of Maplevue Drive and Veterans Drive would require substantial improvements be made at that location. Given that these impacts will be alleviated upon completion of the McKay Road interchange with Highway 400, it makes better sense to hold off further development of the Watersand Employment draft plan until such time as the interchange is completed.
4. Signalization of the Watersand Employment access intersections is not warranted in the 2021 time frame, but will likely become warranted as development proceeds to full buildout after the McKay Interchange is constructed, and as Phase 2 development proceeds throughout the Secondary Plan area.
5. The timing of development of the Watersand Employment draft plan relative to the planned improvements to Veterans Drive mean that the access road intersection improvements will have to be pre-built.
6. The intersections of Salem Road and McKay Road West with Veterans Drive, as well as Essa Road and Salem Road will adequately handle forecast traffic volumes in their ultimate configurations.
7. The timing of the need for these improvements (2020 based on the anticipated Phase 1 development schedule) is consistent with the planned widening and urbanization of McKay Road West, Veterans Drive, Essa Road, and Salem Road in the 2020 to 2021 timeframe.

Finally, the Phase 1 draft plans considered in this study are anticipated to have a minimal impact on the Maplevue Drive corridor and Highway 400 interchange. **The results of the intersection analysis at these intersections indicate that the traffic attributable to the four Salem Secondary Plan Phase 1 draft plans will have no appreciable impact on the level of service at these key intersections.**



2.0 INTRODUCTION

Watersand Construction, an affiliate of DG Group, is proposing the development of employment based land uses on a 35.795 hectare property (referred to in this study as the Watersand Employment draft plan) by means of a Draft Plan of Subdivision.

The subject property comprises part of Lot 6 within Concession 9 in the Salem Secondary Plan which, along with the Hewitt's Secondary Plan to the east, comprises the "Annexed Lands" located to the south of the City of Barrie (see Figures 1 and 2). These lands became part of the City of Barrie as of January 1, 2010 as a result of the Barrie-Innisfil Boundary Adjustment Act, which extended the southern boundary of Barrie to include 2,335 hectares of land previously in the Town of Innisfil.

The proposed Watersand Employment draft plan is located south of McKay Road West, east of Veterans Drive, and west of Highway 400. Figure 3 shows the location of the Watersand Employment property (area "E") along with four planned Phase 1 residential subdivision developments in the Salem Secondary Plan Area.

The primary purpose of this study is to identify road and intersection improvement requirements in the immediate vicinity of the Watersand Employment draft plan, and at key arterial intersections that will be impacted by traffic generated as a result of development of this site.

A secondary objective is to establish how much employment development can be supported on these lands by 2021, that is, prior to the completion of the Harvie Road and Big Bay Point Road crossing of Highway 400 and of the full interchange at McKay Road

As requested by City of Barrie staff, this study is also intended to assess the impact of traffic related to the proposed Phase 1 developments on the Maplevue Drive Corridor in the vicinity of Highway 400. This assessment has been undertaken in response to concerns that there are currently capacity limitations with respect to traffic in south Barrie accessing the Highway 400 corridor, as well as crossing the corridor.

An assessment has therefore been undertaken of the impact of the development of the Watersand Employment draft plan (along with four Phase 1 residential subdivision developments in the Salem Secondary Plan Area) on the operations of the intersections of the Highway 400 ramps with Maplevue Drive.

Work is underway by the City of Barrie to address these limitations by way of two substantial infrastructure projects:

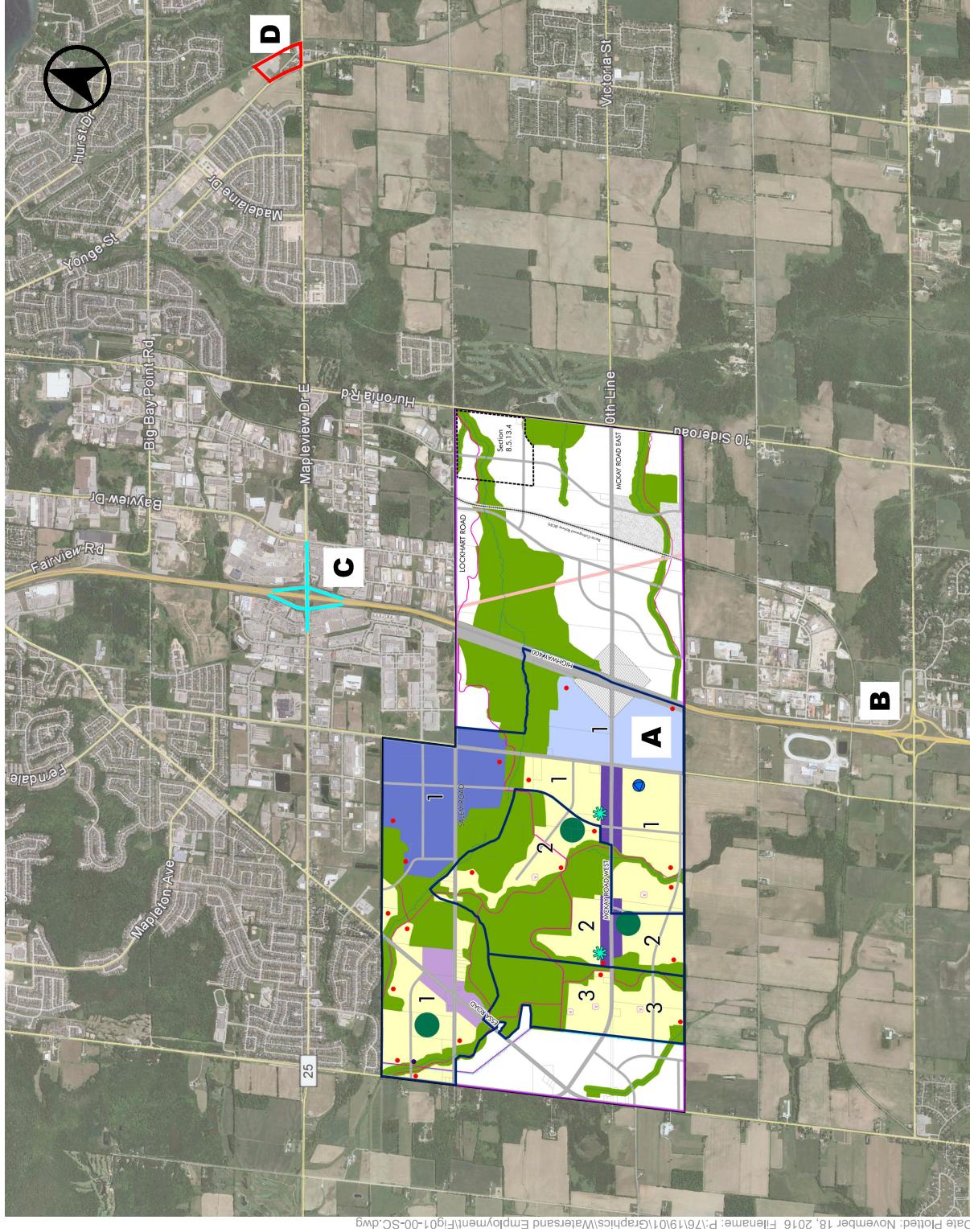
- A new crossing of Highway 400 at Harvie Road / Big Bay Point Road (north of Maplevue Drive), anticipated to be completed by late 2021. This crossing will provide an alternative route for traffic crossing the Highway 400 corridor in south Barrie, and will thereby relieve the Maplevue Drive corridor.
- A new full interchange to be constructed at McKay Road and Highway 400, and anticipated to be in place by 2022. This will provide direct and convenient access to Highway 400 as the Salem



Secondary Plan builds out beyond Phase 1, as well as providing relief to the busy Maplevue Drive interchange.

After completion of the Harvie Road / Big Bay Point Road crossing, it is anticipated that a substantial amount of through traffic will divert from Maplevue Drive to the new crossing, thereby providing relief to the intersections in the Maplevue Drive interchange.





Date Plotted: November 18, 2016 File Name: P:\7619\10\1\Graphics\Watersand Employment\Fig01-00-SC.dwg

Site

- A Watersand Employment Draft Plan

Interchanges

- B Innisfil Beach Road
- C Mapleview Drive

GO Transit

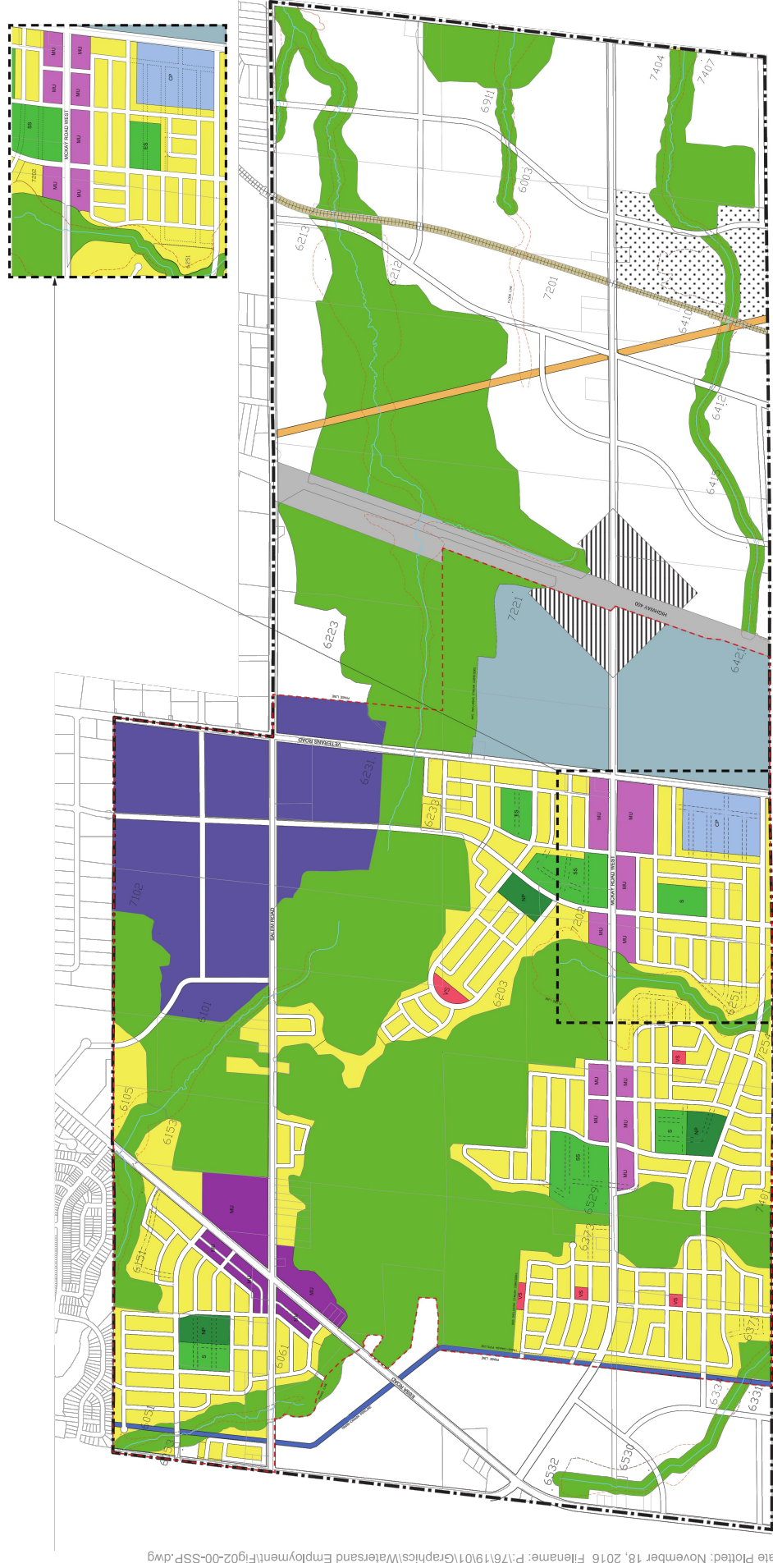
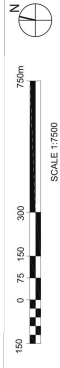
- D Barrie South Station

SITE CONTEXT

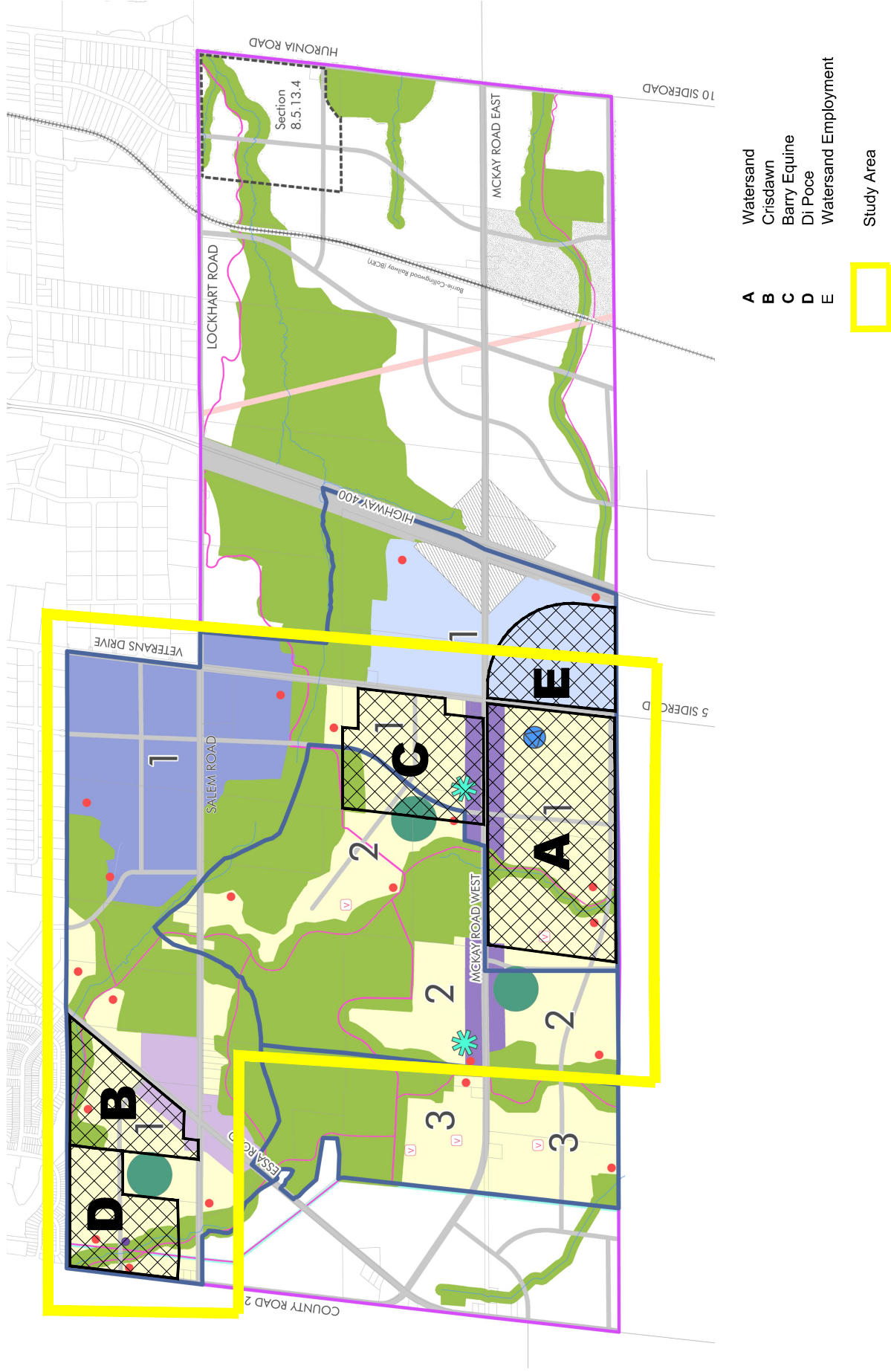
FIGURE 4.1

SALEM SECONDARY PLAN - MASTER PLAN

15 FEBRUARY 2013



SALEM SECONDARY PLAN



PHASE 1 DRAFT PLANS

3.0 DEVELOPMENT CONTEXT

3.1 STUDY AREA

The study area for this traffic impact study is shown in Figure 3. It has been defined so as to include the four subdivisions for which Draft Plan applications are anticipated to be filed during Phase 1 development of the Salem Secondary Plan, as well as those components of the area road network that will be impacted by this Phase 1 traffic.

As explained in the introduction, this study also includes an assessment of traffic impacts to the north of the study area in the vicinity of the Maplevue Drive interchange with Highway 400.

3.2 PROPOSED LAND USES

Figure 4 shows the proposed Draft Plan of Subdivision for the Watersand property.

For purposes of this study, the land use program assumed for the Watersand Employment draft plan is the development of Business Park related land uses on 30.314 hectares of net developable land.

As noted above, one of the objectives of this study is to determine how much of this land can be developed by the 2021 timeframe, that is, prior to the completion of the Harvie Road / Big Bay Point Road crossing of Highway 400, and shortly thereafter the completion of the McKay Road interchange.

3.3 OTHER DEVELOPMENTS IN THE STUDY AREA

The application that is the subject of this traffic impact study is one of several subdivisions for which Draft Plan applications will be proceeding as part of the Phase 1 Development of the Salem Secondary Plan. The analysis undertaken for this study takes into account the site traffic from four other residential draft plans (as shown in Figure 3). As of October 2016, specific development details and plans have been prepared for two of these subdivisions, for which traffic studies were submitted:

- Watersand, which is the subject of this study, and
- Crisdawn which is shown as area B in Figure 3, and the details of which are laid out in the traffic study that will be submitted with that application.

The Watersand subdivision, as noted above is assumed to have 800 residential units in place by 2021, and the full 1,445 units by the end of 2025. The Crisdawn subdivision will be fully built out with 478 residential units in place by the end of 2021.

The other two Phase 1 draft plan areas (the H&H Capital and DiPoce properties) are assumed for purposes of this study to each comprise 600 single detached residential units, all of which will be built by the 2021 horizon year.

To be clear, this study includes the traffic from all four of the residential draft plans accounted for to date.

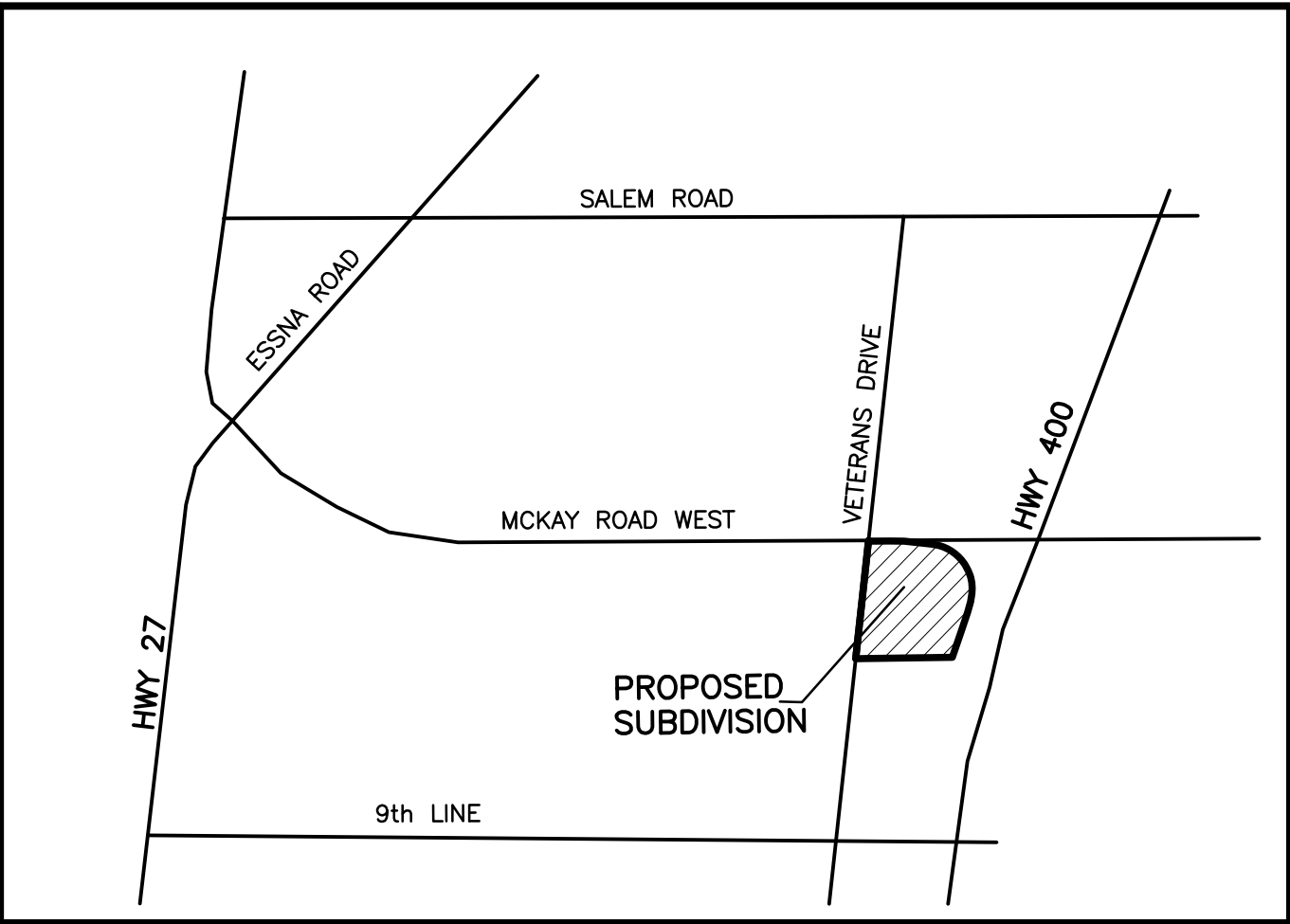


DRAFT PLAN OF SUBDIVISION
PART OF THE LOT 6,
CONCESSION 9
(GEOGRAPHIC TOWNSHIP OF INNISFIL)
CITY OF BARRIE
COUNTY OF SIMCOE

SCALE 1:2000



DRAFT PLAN T-



KEY PLAN

SECTION 51, PLANNING ACT,
ADDITIONAL INFORMATION

- A. AS SHOWN ON DRAFT PLAN
- B. AS SHOWN ON DRAFT PLAN
- C. AS SHOWN ON DRAFT PLAN
- D. SEE SCHEDULE OF LAND USE
- E. AS SHOWN ON DRAFT PLAN
- F. AS SHOWN ON DRAFT PLAN
- G. AS SHOWN ON DRAFT PLAN
- H. MUNICIPAL PIPED WATER AVAILABLE AT TIME OF DEVELOPMENT
- I. CLAY-LOAM
- J. AS SHOWN ON DRAFT PLAN
- K. SANITARY AND STORM SEWERS, GARBAGE COLLECTION, FIRE PROTECTION
- L. AS SHOWN ON DRAFT PLAN

SURVEYOR’S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE
SUBDIVIDED AS SHOWN ON THIS PLAN, AND THEIR RELATIONSHIP TO
THE ADJACENT LAND ARE ACCURATELY AND CORRECTLY SHOWN.

DATE -----, 2016
GARY B. VANDERVEEN
ONTARIO LAND SURVEYOR
HOLDING JONES VANDERVEEN INC.

OWNER’S CERTIFICATE

I AUTHORIZE KLM PLANNING PARTNERS INC. TO PREPARE AND SUBMIT
THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF BARRIE FOR APPROVAL.

OWNER
WATERSAND CONSTRUCTION LTD.
C/O
DG GROUP
30 FLORAL PARKWAY
SUITE 300
CONCORD, ONTARIO
L4K 4R1
ROBERT De GASPERIS
A.S.O.

SCHEDULE OF LAND USE

TOTAL AREA OF LAND = 35.795±Ha. (88.451±AcS.)

		BLOCKS	LOTS	UNITS	±Ha.	±AcS.
BLOCKS 1-16	- EMPLOYMENT	16			30.314	74.907
BLOCK 17	- S.W.M.	1			0.968	2.392
BLOCK 18	- ROAD WIDENING	1			0.721	1.782
BLOCKS 19	- BUFFER	1			1.312	3.242
STREETS					2.480	6.128
23.0m. WIDE TOTAL LENGTH= 1240±m. AREA= 2.480±Ha.						
TOTAL			19		35.795	88.451

NOTE — ELEVATIONS RELATED TO
CANADIAN GEODETIC DATUM



KLM
PLANNING PARTNERS INC.

PROJECT No. P-2758
SCALE 1:2000
(2758DES2) X-REF: (2758MAS & 2758TOPO)
DWG. No. - 16:1
64 JARDIN DRIVE - UNIT 1B, CONCORD, ONTARIO L4K 3P3
TEL: (905) 669-4055 FAX: (905) 669-0097 design@klmplanning.com

SEPT. 27, 2016
Planning • Design • Development

3.4 TRANSPORTATION SYSTEM

3.4.1 Existing City of Barrie Roads

The existing road network in the vicinity of the study area is shown in Figure 5. The key City of Barrie roads are as follows:

- McKay Road West:
 - o From County Road 27 to Highway 400 crossing:
 - 2 lane paved rural cross section arterial road
 - posted speed limit of 80 km/hr
- It should be noted that the McKay Road overpass of Highway 400 was demolished in May of 2016, to be rebuilt as part of the MTO's Highway 400 upgrade program. As a result, traffic counts conducted in this area after this date must be treated with caution due to the rerouting of traffic that would have otherwise used this crossing. It is anticipated that the crossing will be reconstructed by October 2017.
- Veterans Drive:
 - o From Maplevue Drive West south to Salem Road:
 - 5 lane paved and urbanized arterial road, with a continuous centre left turn lane
 - posted speed limit of 60 km/hr
 - o From Salem Road south to the Barrie city limit:
 - 2 lane paved rural cross section arterial road
 - posted speed limit of 80 km/hr
 - Salem Road:
 - o From County Road 27 to Veterans Drive:
 - 2 lane paved rural cross section arterial road
 - posted speed limit of 80 km/hr
 - Essa Road:
 - o Maplevue Drive West to about 850m south
 - 2 lane paved urbanized arterial road
 - posted speed limit of 60 km/hr
 - o about 850 south of Maplevue Drive West to Salem Road
 - 2 lane paved rural cross section arterial road
 - posted speed limit of 80 km/hr
 - o Salem Road to McKay Road:
 - 2 lane paved rural cross section arterial road
 - posted speed limit of 80 km/hr

The key intersections in the study area are configured as follows:

- McKay Road West and Veterans Drive:
 - o Signalized control
 - o No dedicated turn lanes
- Veterans Drive and Salem Road:



- o Side street (Salem Road) stop controlled.
- o The southbound approach has dedicated Left and Right turn lanes
- Essa Road and Salem Road:
 - o Side street (Salem Road) stop controlled.
 - o The southbound and northbound approaches have dedicated left turn lanes

Also included in this study is an assessment of traffic operations in the section of the Maplevue Drive corridor that connects to Highway 400.

Maplevue Drive West from Veterans Drive east to the Highway 400 interchange is a 6 lane urbanized arterial road with continuous centre left turn lane, and a posted speed limit of 60 km/hr

The key intersections that have been assessed in this corridor are:

- Maplevue Drive West and Veterans Drive:
 - o Signalized control
 - o All approaches have dedicated Left turn lanes
- Maplevue Drive West and Highway 400 Ramps:
 - o Signalized control
 - o Eastbound approach has a dedicated Right turn lane
 - o Westbound approach has a dedicated Left turn lane
- Maplevue Drive East and Highway 400 Ramps:
 - o Signalized control
 - o Eastbound approach has dedicated dual Left turn lanes
 - o Westbound approach has a dedicated Right turn lane

3.4.2 Provincial Highway

The Salem Secondary Plan spans the Highway 400 corridor, a key transportation component in south Barrie and beyond. At present there are two interchanges available to traffic oriented to and from the Salem Secondary Plan.

- The Maplevue Drive interchange is located to the north, about 4.0 kilometres from the intersection of Veterans Drive and McKay Road West. This interchange is located in a busy commercial corridor, and is very highly utilized today.
- The Innisfil Beach Road is located to the south, about 3.3 kilometres from the intersection of Veterans Drive and McKay Road West. This interchange is located in a relatively rural area, and is not highly utilized today during weekday peak hours.



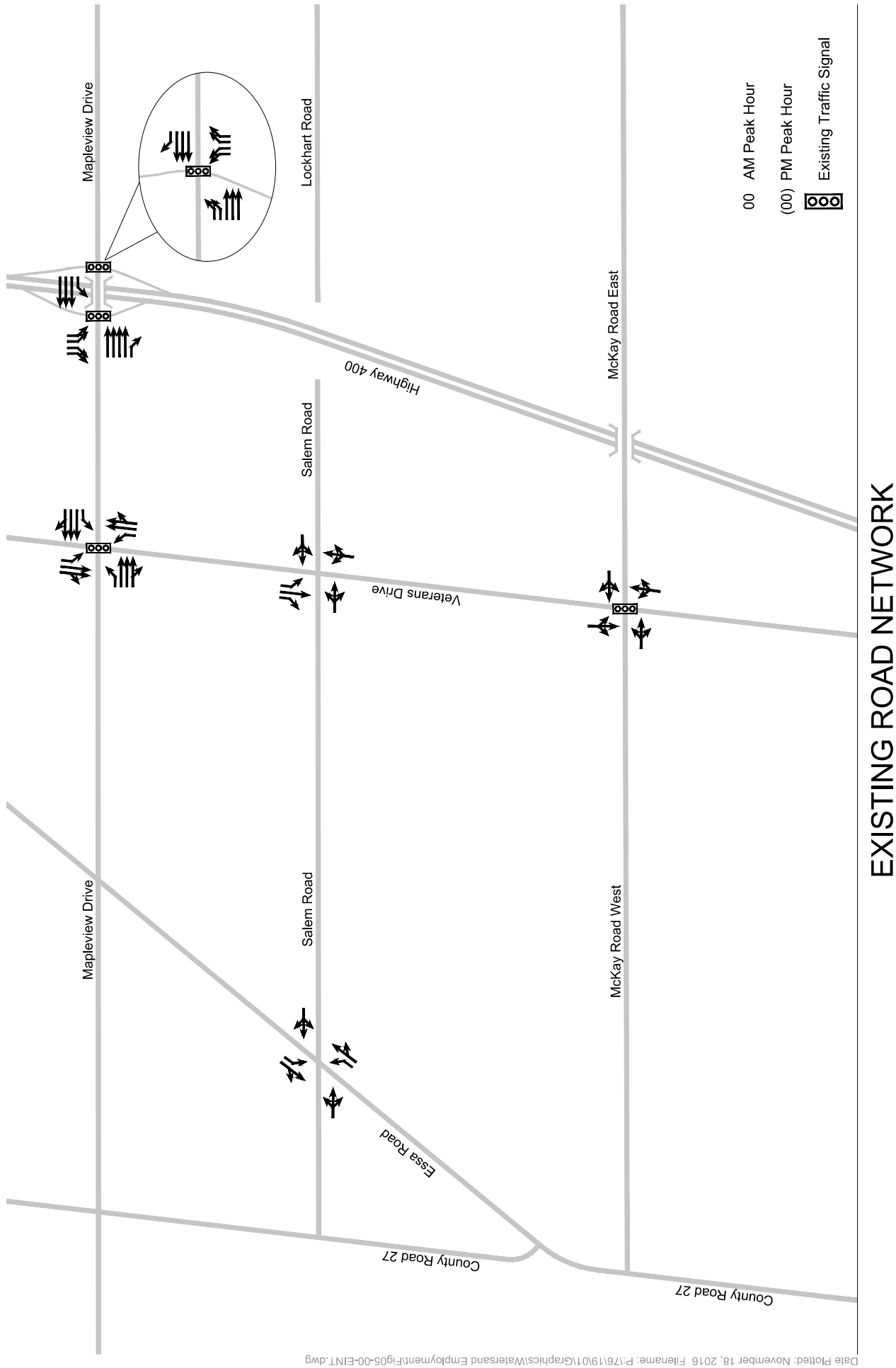
There is only one crossing of Highway 400 in the vicinity of the Salem Secondary Plan area, that of McKay Road. This crossing was demolished in May 2016 as the prelude to a reconstruction by MTO as part of their Highway 400 corridor upgrade work. It is anticipated that this crossing will be restored (as a 2 lane crossing) by 2018.

3.5 EXISTING TRANSIT SERVICE

There is currently no transit service to this area of the City of Barrie. The existing routes that come closest to the Salem Secondary Plan area are

- the number 7 service, which serves the commercial area east of Veterans Drive and north of Salem Road
- the number 8 service which runs along the Maplevue Drive corridor, connecting to the Barrie South GO station





EXISTING ROAD NETWORK

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3.6 COMMITTED AND PROPOSED TRANSPORTATION IMPROVEMENTS

A number of capital road improvement projects related to development of the Salem and Hewitt's Secondary Plans have been committed to by the City of Barrie over the upcoming years. These include:

- Veterans Drive widening and urbanization.
 - as a 5 lane road (with cycling lanes) south from Salem Road to McKay Road West is scheduled for completion by 2021.
 - as a 3 lane road (with cycling lanes) south from McKay Road West to the City Limits is scheduled for completion by 2021.
- McKay Road widening and urbanization
 - as a 5 lane road (with cycling lanes) from Highway 400, west past Veterans Drive to Street "3" as designated in the Watersand Draft Plan is scheduled for completion by 2022.
 - as a 3 lane road (with cycling lanes) west from Street "3" to west of the Watersand Draft Plan is scheduled for completion by 2024.
- Salem Road widening and urbanization
 - as a 3 lane road (with cycling lanes) west from Veterans Drive to County Road 27 is scheduled for completion by 2021.
- Essa Road widening and urbanization
 - as a 3 lane road (with cycling lanes) from the former Barrie city limits to about 660 metres south of Salem Road is scheduled for completion by 2021.
- McKay Road interchange with Highway 400 is currently scheduled for completion about 2022.
- Salem Road crossing of Highway 400 is currently scheduled for completion by 2026.

Another project that will benefit traffic in south Barrie is the crossing of Highway 400 at Harvie Road and Big Bay Point Road. This project will provide an additional connection across the Highway 400 corridor to the north of Maplevue Drive, and thereby provide an alternative route for traffic which today uses Maplevue to cross the Highway 400 corridor. This project is currently in the early stages of design, and at this time is anticipated to be completed and operational by the end of 2021.



3.7 PROPOSED COMMUNITY ROAD NETWORK

The Watersand Employment draft plan road network (as shown in Figure 4) comprise three Employment roads in a 20 metre right-of-way.

The characteristics for these roads (among others) were reviewed and updated for use in the City of Barrie Annexed Lands as part of the 2014 City of Barrie Multi-modal Active Transportation Master Plan (MMATMP) study.

The Employment roads allow for:

- o Two 3.5m travel lanes
- o Two 1.5m Bike lanes
- o Parking on one side
- o Sidewalks on both sides



4.0 2021 HORIZON YEAR TRAFFIC ASSESSMENT

4.1 HORIZON YEAR

The horizon year used for the main analysis in this study is 2021, which is the year in which it is anticipated that the Harvie Road / Big Bay Point Road crossing of Highway 400 will be completed. The analysis in this year thus tests the impact of the traffic attributable to the anticipated Phase 1 development levels in the Salem Secondary Plan on the road network that will be in place just before this important new crossing of Highway 400 is available. This is the time horizon at which any capacity constraints related to crossing and accessing Highway 400 in south Barrie are anticipated to peak.

Full buildout of the Watersand Employment draft plan is anticipated to occur thereafter by about 2026. An additional full buildout analysis of Phase 1 traffic has therefore also been conducted using a 2026 horizon year in the following section of this report.

Longer term traffic analysis has not been conducted for this draft plan application. This is in part because the longer term road infrastructure needs for full buildout of the Salem Secondary Plan have already been tested through the City of Barrie's 2014 Multi-modal and Active Transportation Master Plan study process. Additionally, completion of the Harvie Road / Big Bay Point Road crossing in 2021 and the McKay Road interchange in about 2022 will have a substantial, and beneficial, impact on the traffic volumes and patterns in south Barrie. It is therefore more appropriate to deal with traffic in forecasts in the 2026 to 2031 time frame as part of the Phase 2 and 3 traffic studies.

4.2 TIME PERIODS

As this development proposal comprises residential land uses exclusively, the analysis has been conducted for weekday AM and PM peak hours.

4.3 EXISTING TRAFFIC

Existing traffic in the study area has been assessed on the basis of the following traffic counts:

- Veterans Drive and McKay Road, 30 April 2015
- Salem Road and Essa Road, 9 September 2016
- Mapleview Drive & Highway 400 Ramps, East Side: 7 August 2015
- Mapleview Drive & Highway 400 Ramps, West Side: 7 August 2015
- Mapleview Drive West and Veterans Drive, 9 September 2016

Full count information reports can be found in Appendix "A" to this study.



At the time that this study analysis was underway, it was deemed unreliable to depend on the results of any traffic counts undertaken along Veterans Drive during the absence of the McKay Road crossing of Highway 400 (which was demolished in May 2016 pending reconstruction). For this reason, and in the absence of any recent traffic count undertaken at Veterans Drive and Salem Road, the existing traffic volumes at this location have been estimated on the basis of the counts at the three surrounding major intersections.

Figure 6 shows the existing traffic volumes

On the basis of an assessment of historic traffic counts it was determined that an annual rate of 2% per year was appropriate to represent the growth in corridor background traffic in this area. This growth factor has been applied to the through movements to produce 2021 background traffic volumes, as shown in Figure 7.

4.4 TRIP GENERATION

4.4.1 2021 Development Intensity

The 2021 analysis presented herein reflects the results of an iterative process that was undertaken to determine how much Business Park employment development could be supported by the 2021 road network, that is, the year in which it is anticipated that the Harvie Road / Big Bay Point Road crossing of Highway 400 will be completed

The results of this sensitivity analysis are reflected in Table 1 below. Of the 30.314 hectares of developable land in the Watersand Employment draft plan, just 4.22 hectares (or 10.43 acres) of Business Park employment lands uses can be developed up to 2021.

It is estimated that the development of additional employment lands in this draft plan prior to 2021 would have negative impacts at the intersection of Veterans Drive and Maplevue Drive, particularly with respect to the capacity to move westbound left turning traffic.

This issue will be relieved somewhat upon completion of the Harvie Road / Big Bay Point Road crossing of Highway 400, and resolved entirely upon the subsequent completion of the McKay Road interchange in 2022.

There are, therefore, three possible solutions:

1. Accept a congested condition on the westbound left turn movement at Veterans Drive and Maplevue Drive for a relatively short period of time. This would require City of Barrie staff to accept a congested condition for a period of time as long as 2 to 3 years (depending on the pace of development) in a corridor that is already perceived to be congested.
2. Undertake improvements at this intersection by constructing dual left turn lanes on the east and west approaches. This would require substantial improvements, likely including the acquisition of additional property. Given that the situation will “resolve itself” after 2022, it may not be fiscally reasonable to undertake these works.

3. Delay development of the Watersand Employment draft plan beyond 4.22 hectares until completion of the Harvie Road / Big Bay Point Road crossing.

For purposes of this study, we are proceeding on the assumption that the third solution is preferred.

4.4.2 Transit Adjustment

Traffic attributable to the Watersand community has been generated using ITE trip generation rates. These rates have been adjusted to reflect the City of Barrie's commitment through their 2014 Multi-modal Active Transportation Master Plan (MMATMP) study, as well as the Salem Secondary Plan to *"place a high priority on supporting active transportation (walking and cycling) and on accessibility to public transit in all new growth areas."* (Planning Principle "h", Salem Secondary Plan).

Figure 7-2 in the MMATMP illustrates a 2031 Transit Network, with three new or extended transit routes servicing this new community along Veterans Drive, McKay Road and Essa Road. One of these service provides direct service between McKay Road and the Barrie South GO Station.

Such service would directly benefit each of the four Phase 1 draft plans included in this study, including the Watersand Employment draft plan.

The Salem landowners encourage the City of Barrie, in light of their stated high priority for transit in new growth areas, to introduce such service as early as possible so as to encourage and support transit adoption from the outset, that is, as residents move into their new communities.

For purposes of this analysis, it has therefore been assumed that one or more preliminary transit services have been extended as far south as McKay Road West so as to serve the Watersand Employment draft plan.

It would, on this basis, be reasonable to assume a modest 5% reduction to the ITE trip generation rates. This is reflected in the trip generation summary table (Table 1) below.

TABLE 1 VEHICLE TRIP GENERATION – 2021

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
ITE Land Use Code 770	16.03	2.83	18.86	3.37	13.47	16.84
Total Rounded Trips (10.43 Acres)	165	30	195	35	140	175
Transit Reduction (5%)	10	0	10	0	5	5
Net Total Trips	155	30	185	35	135	170

Table 2 summarizes the trip generation assumptions for the four Salem Secondary Plan Phase 1 residential draft plans for which the traffic is included in this analysis (and for two of which traffic studies have already been submitted).

TABLE 2 TRIP GENERATION – 2021 SCENARIO

		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
ITE LUC 210	Units	0.2	0.57	0.77	0.65	0.37	1.02
ITE LUC 231	Units	0.1	0.44	0.54	0.35	0.29	0.64
ITE LUC 220	Units	0.16	0.39	0.55	0.41	0.26	0.67
Watersand							
Single Family / Semi Detached	580	116	331	447	377	215	592
Townhouse	220	22	97	119	77	64	141
5% Transit Reduction		7	21	28	23	14	37
Watersand Total		131	406	537	431	264	696
Crisdawn							
Single Family / Semi Detached	250	49	139	187	158	90	248
Townhouse	132	13	58	71	46	38	84
Apartment	96	15	37	53	39	35	64
5% Transit Reduction		4	12	16	12	8	20
Crisdawn Total		73	222	296	231	145	377
H&H Capital							
Single Family / Semi Detached	600	120	342	462	390	222	612
5% Transit Reduction		6	17	23	20	11	31
H&H Capital Total		114	325	439	371	211	581
DiPoce							
Single Family / Semi Detached	600	120	342	462	390	222	612
5% Transit Reduction		6	17	23	20	11	31
DiPoce Total		114	325	439	371	211	581
Sum Total							
Total Residential Trips	2352	432	1278	1711	1404	832	2235

4.5 TRIP DISTRIBUTION

The distribution of trips to and from the Phase 1 Draft Plan areas assessed in this study was based on information from the 2011 Transportation Tomorrow Survey (TTS). All of the TTS zones comprising the south part of Barrie were aggregated to create a proxy zone for this purpose.

The TTS distribution was then mapped to the road network in the Salem Secondary Plan area. The results of this assessment are documented in the following tables.

TABLE 3 WATERSAND EMPLOYMENT DRAFT PLAN TRIP DISTRIBUTION

Direction (to / from)	Inbound	Outbound
North on Veterans Drive	12% (12%)	20% (20%)
South on Essa	18% (18%)	- (-)
North on Essa	- (-)	14% (14%)
South on Veterans Drive	16% (16%)	11% (11%)
East on McKay Road	23% (23%)	19% (19%)
West on McKay Road	16% (16%)	23% (23%)
North on Highway 404	5% (5%)	9% (9%)
South on Highway 404	10% (10%)	4% (4%)
Total	100% (100%)	100% (100%)

TABLE 4 RESIDENTIAL DRAFT PLAN TRIP DISTRIBUTIONS

Watersand & H&H Capital Draft Plans

Direction (to / from)	Inbound	Outbound
North on Veterans Drive	17% (17%)	17% (17%)
North on Essa	27% (27%)	27% (27%)
South on Veterans Drive	3% (3%)	3% (3%)
East on McKay Road	21% (21%)	21% (21%)
West on McKay Road	2% (2%)	2% (2%)
North on Highway 400	6% (6%)	6% (6%)
South on Highway 400	23% (23%)	23% (23%)
Total	100% (100%)	100% (100%)

Crisdawn Draft Plan

Direction (to / from)	Inbound	Outbound
North on Essa Road	44% (44%)	44% (44%)
East on McKay Road	21% (21%)	21% (21%)
South on Veterans Drive	3% (3%)	3% (3%)
North on County Road 27	2% (2%)	2% (2%)
North on Highway 400	6% (6%)	6% (6%)
South on Highway 400	23% (23%)	23% (23%)
Total	100% (100%)	100% (100%)

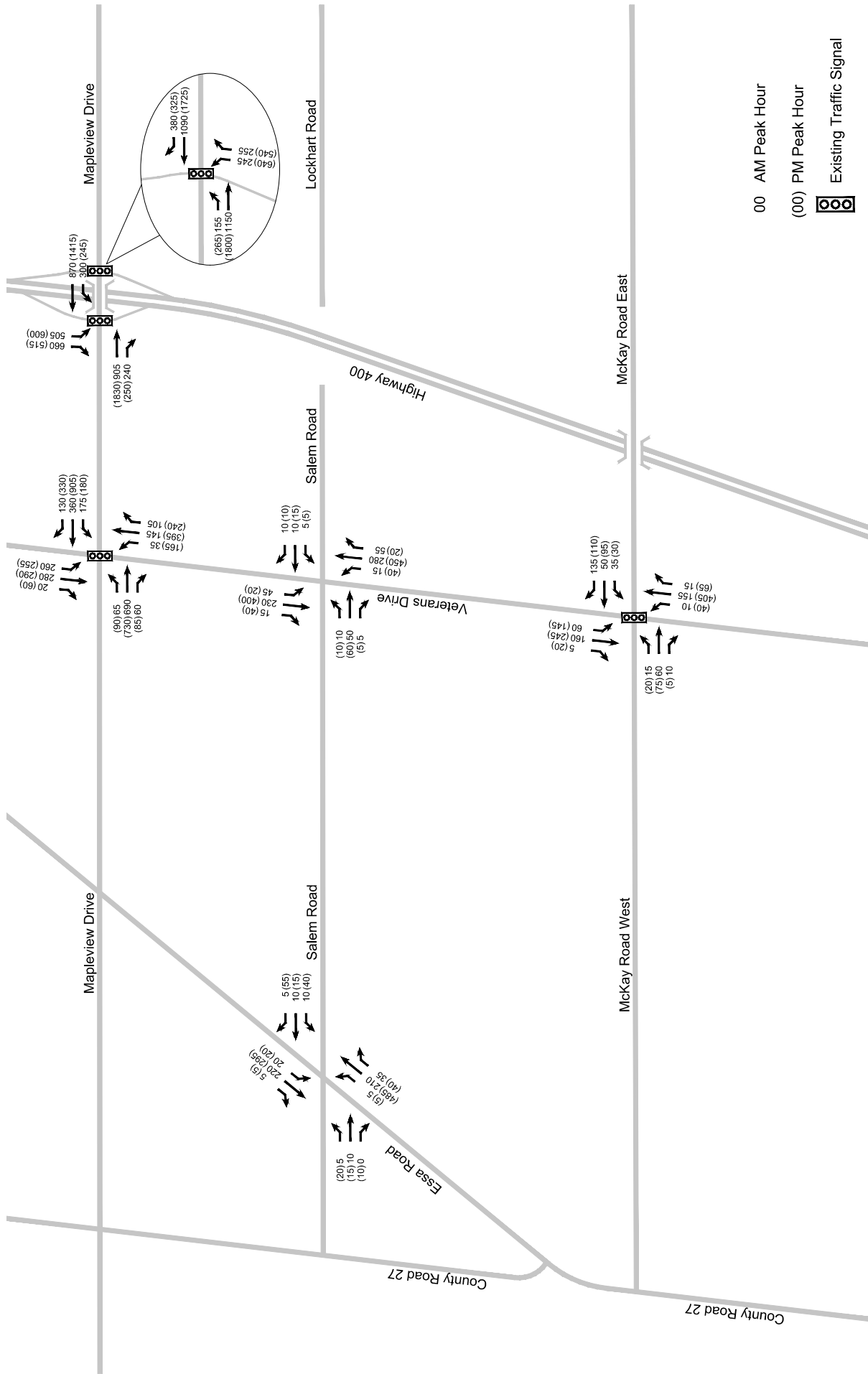
DiPoce Draft Plan

Direction (to / from)	Inbound	Outbound
North on Essa Road	44% (44%)	25% (25%)
East on McKay Road	21% (21%)	11% (11%)
North on County Road 27	32% (32%)	32% (32%)
South on County Road 27	3% (3%)	3% (3%)
North on Highway 400	6% (6%)	6% (6%)
South on Highway 400	23% (23%)	23% (23%)
Total	100% (100%)	100% (100%)

The trip distribution for the Watersand community is also illustrated in Figure 8

One of the key trip distribution and assignment decisions with respect to the Phase 1 Salem Secondary Plan draft plans is the allocation to and utilization of the available Highway 400 interchanges, namely the Mapleview Drive and Innisfil Beach Road interchanges.

As noted above (section 3.4.2) the distance from the Watersand community is about 4.0 kilometres to the Mapleview interchange, and 3.3 kilometres to the Innisfil Beach Road interchange. It is therefore reasonable to assume that traffic bound to and from the south will utilize the Innisfil Beach Road interchange, as reflected in the distribution numbers in the above table and in Figure 8. The modest assignment of Watersand trips to the Mapleview Drive interchange reflects a small component of traffic directed to the north part of the City of Barrie.



EXISTING TRAFFIC VOLUMES



Figure 6

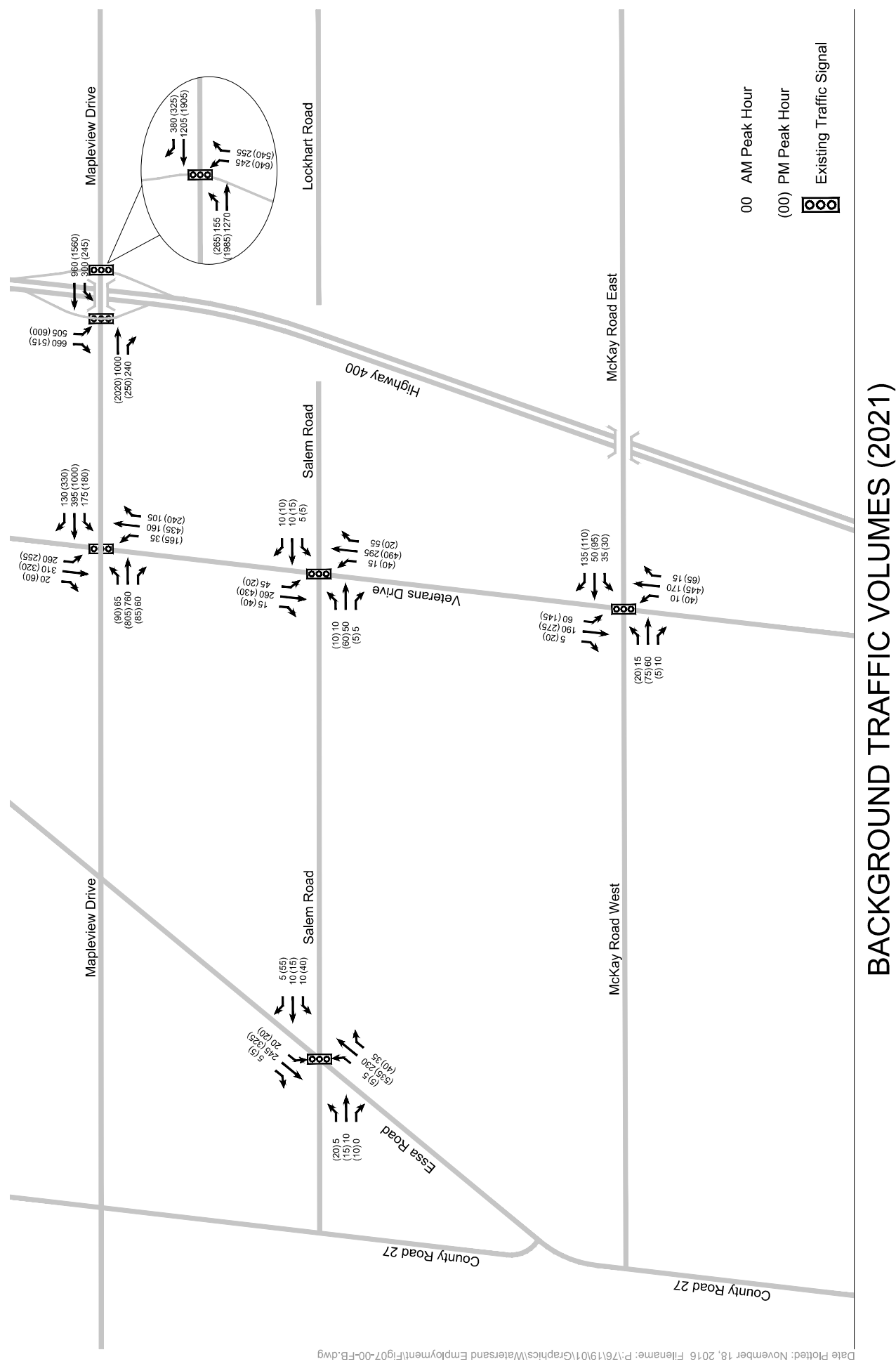


Figure 7

4.6 2021 SITE TRAFFIC VOLUMES

Total site traffic volumes, including each of the draft plans assessed herein, have been calculated on the basis of the trip generation, distribution, and assignment assumptions indicated in the previous two sections.

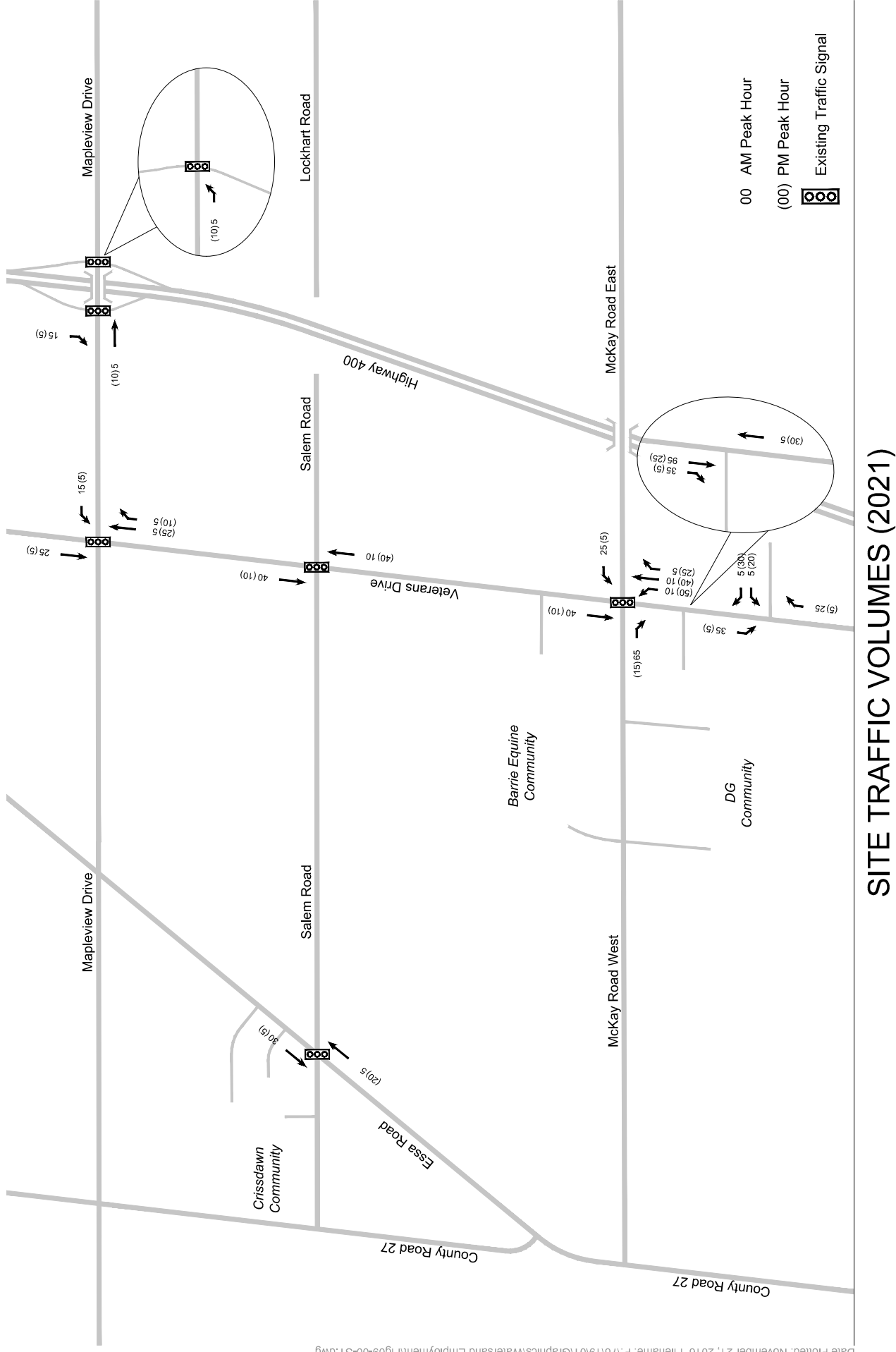
Figure 9 illustrates the assignment of the total site traffic from the four draft plan areas to the area road network.

4.7 2021 TOTAL TRAFFIC VOLUMES

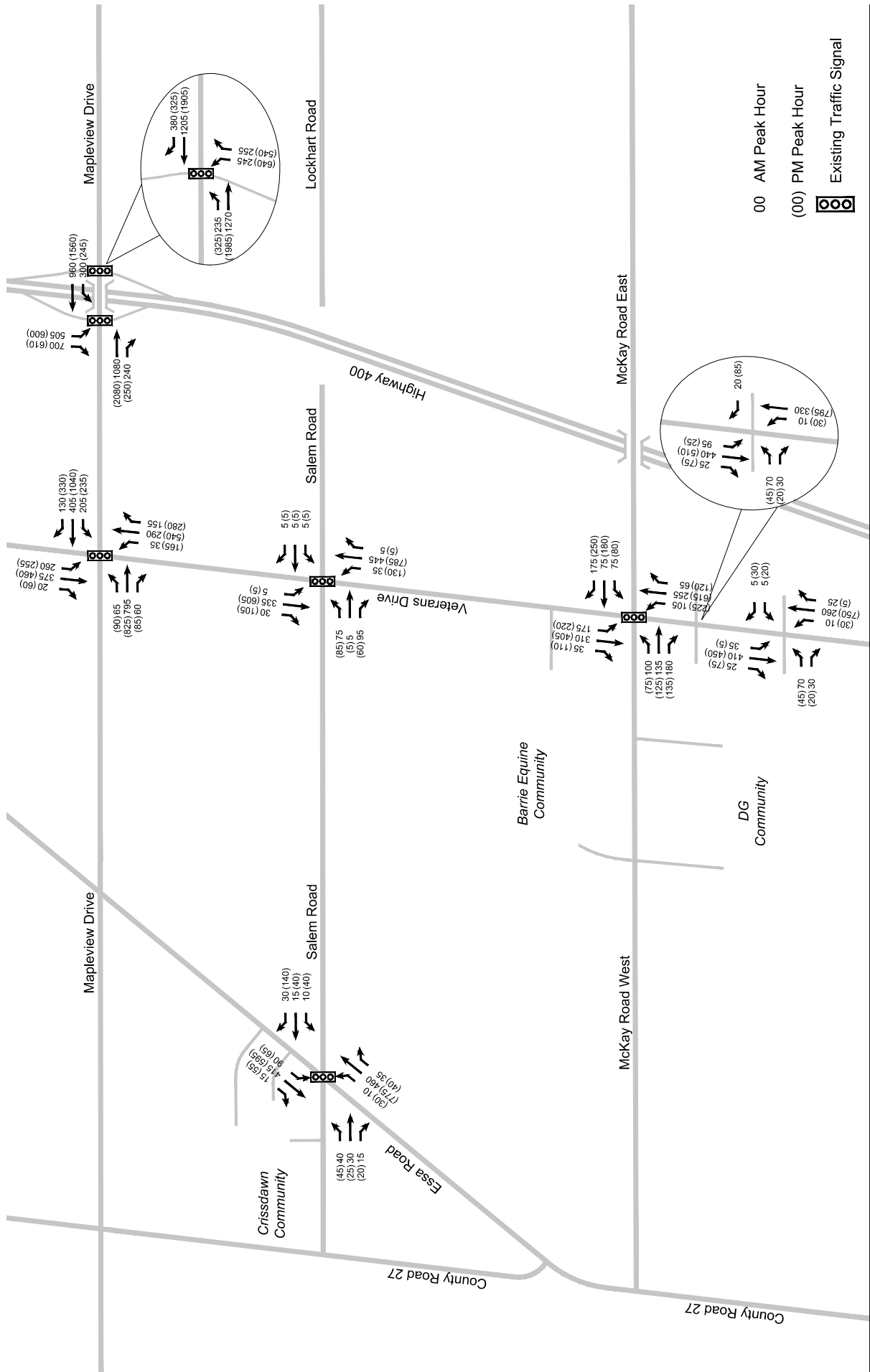
Figure 10 shows the addition of the 2021 site traffic volumes to the 2021 background traffic volumes.



WATERSAND EMPLOTMENT TRIP DISTRIBUTION



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FUTURE TOTAL TRAFFIC VOLUMES (2021)



BA Group

Barrie Salem Secondary Plan
7619-01 November 2016

Figure 10

5.0 2026 HORIZON YEAR TRAFFIC ASSESMENT

5.1 HORIZON YEAR

Full Phase 1 buildout of the Watersand Employment draft plan is anticipated to occur by about 2026. An additional full buildout analysis of Phase 1 traffic has therefore also been conducted using a 2026 horizon year.

Longer term traffic analysis has not been conducted for this draft plan application. This is in part because the longer term road infrastructure needs for full buildout of the Salem Secondary Plan have already been tested through the MMATMP process. Additionally, completion of the Harvie Road / Big Bay Point Road crossing in 2021 and the McKay Road interchange in about 2022 will have a substantial, and beneficial, impact on the traffic volumes and patterns in south Barrie. It is therefore more appropriate to deal with traffic in forecasts in the 2026 to 2031 time frame as part of the Phase 2 and 3 traffic studies

5.2 TRIP GENERATION

The trip generation assumptions used in this longer term analysis are shown in Table 5 below. Note that while the Watersand Employment draft plan proposes substantial development beyond 2021, the Watersand Residential draft plan is the only one of the four residential plans assessed herein which proposes additional development beyond the 2021 horizon year used in the previous analysis.

TABLE 5 VEHICLE TRIP GENERATION – 2026

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
ITE Land Use Code 770	16.03	2.83	18.86	3.37	13.47	16.84
Total Rounded Trips (74.90 Acres)	1200	210	1410	250	1010	1260
Transit Reduction (5%)	60	10	70	15	50	65
Net Total Trips	1140	200	1340	235	960	1195

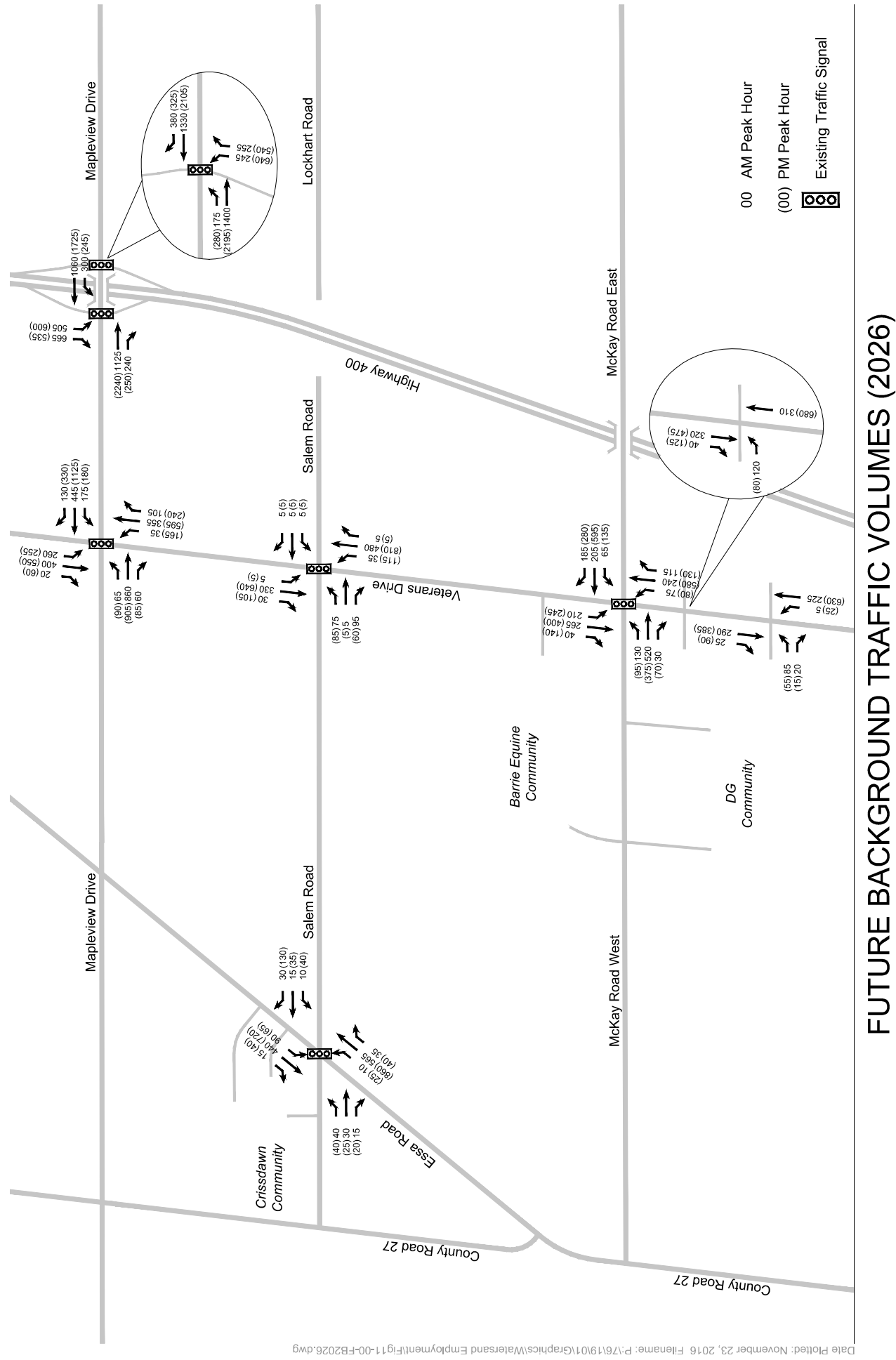


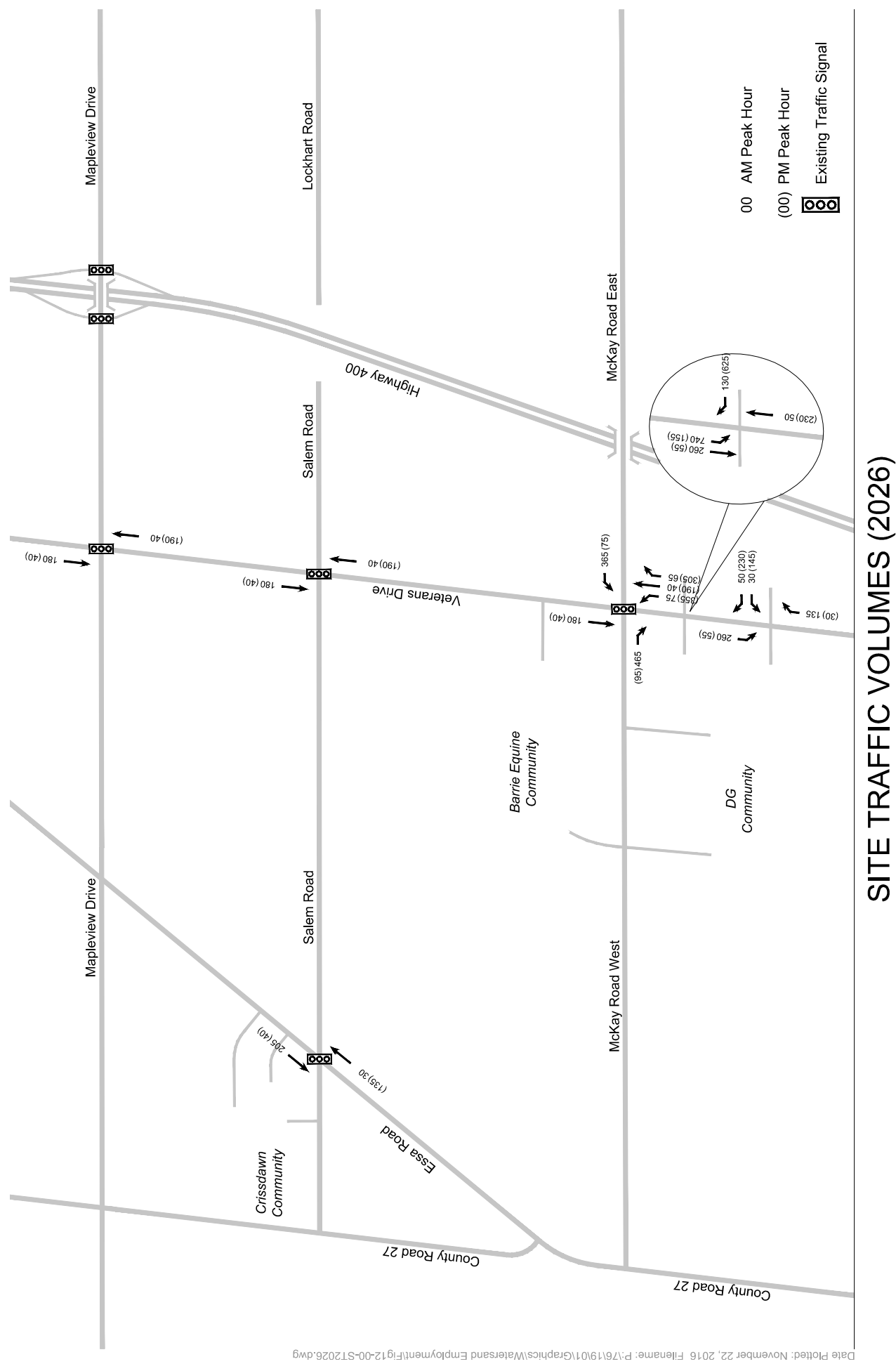
TABLE 6 TRIP GENERATION – 2025 ULTIMATE SCENARIO

		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
ITE LUC 210	Units	0.2	0.57	0.77	0.65	0.37	1.02
ITE LUC 231	Units	0.1	0.44	0.54	0.35	0.29	0.64
ITE LUC 220	Units	0.16	0.39	0.55	0.41	0.26	0.67
Watersand							
Single Family / Semi Detached	1047	208	594	802	677	386	1063
Townhouse	398	40	174	214	139	115	253
5% Transit Reduction		12	38	51	41	25	66
Watersand Total		236	730	965	775	475	1250
Crisdawn							
Single Family / Semi Detached	250	49	139	187	158	90	248
Townhouse	132	13	58	71	46	38	84
Apartment	96	15	37	53	39	35	64
5% Transit Reduction		4	12	16	12	8	20
Crisdawn Total		73	222	296	231	145	377
H&H Capital							
Single Family / Semi Detached	600	120	342	462	390	222	612
5% Transit Reduction		6	17	23	20	11	31
H&H Capital Total		114	325	439	371	211	581
DiPoce							
Single Family / Semi Detached	600	120	342	462	390	222	612
5% Transit Reduction		6	17	23	20	11	31
DiPoce Total		114	325	439	371	211	581
Sum Total							
Total Residential Trips	2352	432	1278	1711	1404	832	2235

5.3 2025 SITE AND TOTAL TRAFFIC VOLUMES

The same trip distribution assumptions have been used in the 2025 assessment as were used in the 2021 assessment. The resulting site traffic volumes are shown in Figure 12





6.0 RESULTS OF TRAFFIC ANALYSIS

Signalized and unsignalized intersection analysis of the 2021 and 2025 total traffic volumes was undertaken using the Synchro software (version 9). The full Synchro reports are included in Appendix “B”.

The future intersection configurations that were determined to be appropriate through this analysis are shown in Figure 13. Where available and appropriate, existing signal timings have been used.

6.1 WATERSAND EMPLOYMENT DRAFT PLAN ACCESS INTERSECTIONS

For purposes of this analysis, the two employment road connections with Veterans Drive) have been assumed to be unsignalized in 2021, and have been found to operate at an acceptable level of service.

Based on the results of the 2026 analysis, it is clear that both locations will need to be signalized. This will likely coincide with the introduction of transit, and the increased need for pedestrians to cross Veterans Drive.

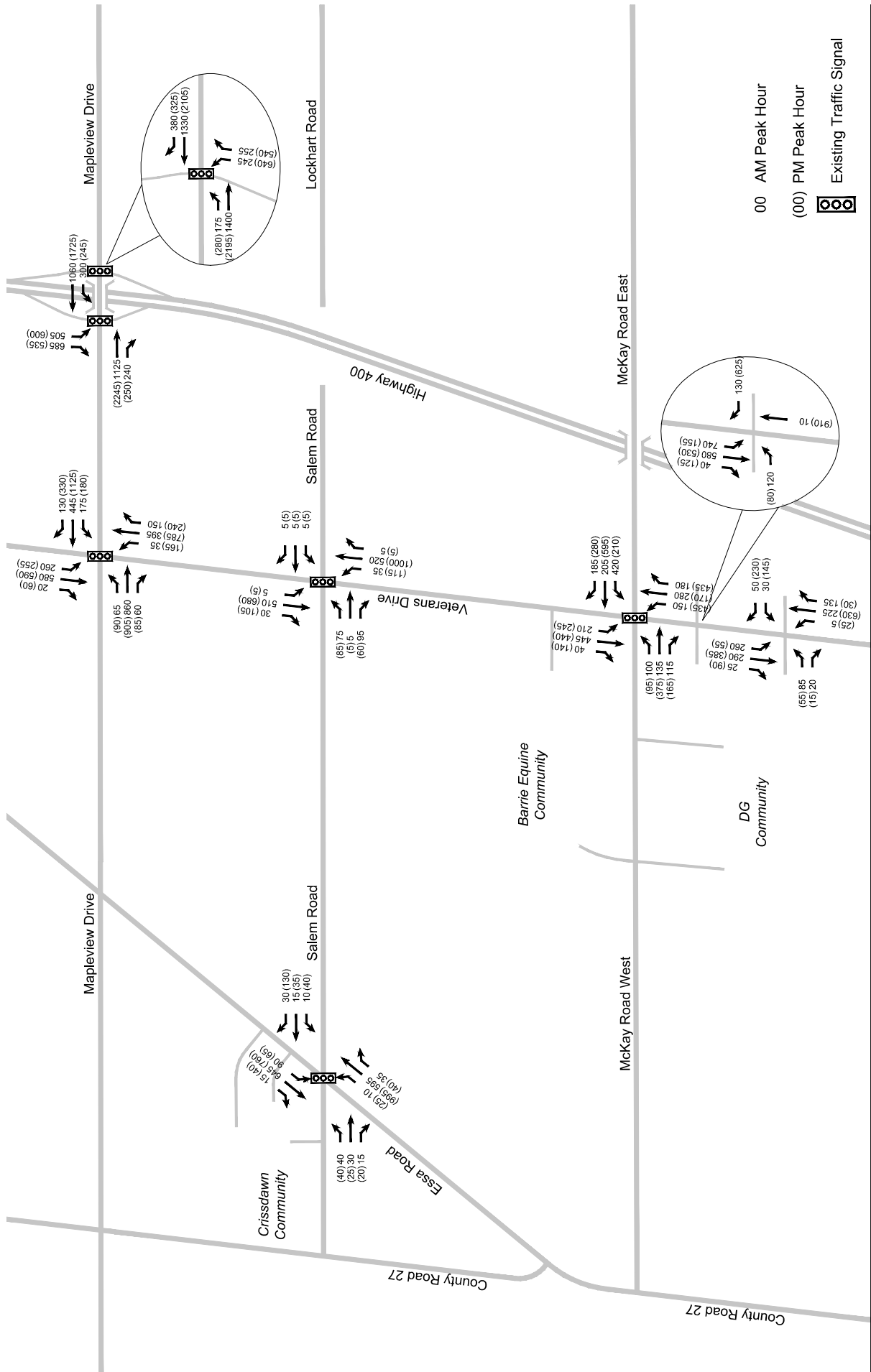
6.1.1 Watersand Access 1: Street “2” & Veterans Road

This intersection is the more southerly of the two access intersections, and connects to the Street “2” collector road in the Watersand Subdivision to the west of Veterans Drive.

- All Veterans Drive (north-south) movements of this intersection operate at LOS A in both horizon years.
- All side street movements operate at LOS C or better in 2021, and D or better upon signalization by 2026.
- No dedicated turn lanes will be required over and above what will be provided as Veterans Drive is ultimately reconstructed.
- In the interim, a dedicated northbound left turn lane can be prebuilt as the intersection is constructed.

Movement	Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out (Unsignalized)			Future Total Conditions – (2026) – Full Build-Out (Signalized)	
	Delay (s)	LOS	Delay (s)	LOS		V/C	LOS
EBLT	13.4 (18.8)	B (C)	26.8 (182.6)	D (F)	EBTL	0.53 (0.25)	D (C)
WBLTR	11.7 (17.9)	B (C)	16.5 (102.4)	C (F)	EBR	0.01 (0.01)	C (B)
NBL	8.3 (8.7)	A (A)	8.0 (8.5)	A (A)	WBLTR	0.26 (0.79)	D (C)
NBTR	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	NBL	0.01 (0.05)	A (A)
SBLT	0.9 (0.2)	A (A)	5.7 (1.9)	A (A)	NBTR	0.15 (0.35)	A (A)
SBR	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	SBTL	0.39 (0.28)	A (A)
					SBR	0.02 (0.06)	A (A)
					Overall	0.39 (0.49)	B (B)

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FUTURE TOTAL TRAFFIC VOLUMES (2026)



BA Group

Barrie Salem Secondary Plan
7619-01 November 2016

Figure 13

6.1.2 Watersand Access 2: Street “31” & Veterans Road

This intersection is the more northerly of the two access intersections, and connects to the local road Street “31” in the Watersand Subdivision to the west of Veterans Drive.

- All Veterans Drive (north-south) movements of this intersection operate at LOS A.
- All side street movements operate at LOS C or better in 2021, and at LOS D or better upon signalization by 2026.
- No dedicated turn lanes will be required over and above what will be provided as Veterans Drive is ultimately reconstructed.
- In the interim, a dedicated northbound left turn lane can be prebuilt as the intersection is constructed.

Movement	Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out (Unsignalized)			Future Total Conditions – (2026) – Full Build-Out (Signalized)	
	Delay (s)	LOS	Delay (s)	LOS		V/C	LOS
EBLT	13.4 (18.8)	B (C)	26.8 (182.6)	D (F)	EBTL	0.53 (0.25)	D (C)
WBLTR	11.7 (17.9)	B (C)	16.5 (102.4)	C (F)	EBR	0.01 (0.01)	C (B)
NBL	8.3 (8.7)	A (A)	8.0 (8.5)	A (A)	WBLTR	0.26 (0.79)	D (C)
NBTR	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	NBL	0.01 (0.05)	A (A)
SBLT	0.9 (0.2)	A (A)	5.7 (1.9)	A (A)	NBTR	0.15 (0.35)	A (A)
SBR	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	SBTL	0.39 (0.28)	A (A)
					SBR	0.02 (0.06)	A (A)
					Overall	0.39 (0.49)	B (B)

6.2 SALEM SECONDARY PLAN KEY ARTERIAL INTERSECTIONS

6.2.1 Veterans Drive and McKay Road West

This currently signalized arterial intersection:

- will continue to serve the heavy north-south traffic on Veterans Drive at LOS B or better
- will serve east-west traffic at an adequate level of service in the 2021 horizon year. Ultimately, when the McKay interchange with Highway 400 is constructed (as early as 2022) the turning movement patterns at this location will dramatically change and we will expect to see improved east-west performance as a result.

Based on sensitivity testing of building permit absorption due to the four Phase 1 draft plans, this intersection will likely be required two years into Phase 1 development of the Salem Secondary Plan, which is 2020 based



on the current development schedule. It can thus be reconstructed as part of the Veterans Drive and McKay Road reconstruction projects, which are scheduled for 2020 through 2021.

Movement	Existing Conditions			Future Background Conditions		Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out	
	V/C	LOS		V/C	LOS	V/C	LOS	V/C	LOS
EBTLR	0.23 (0.26)	C (C)	EBL	0.37 (0.31)	C (C)	0.31 (0.31)	C (C)	0.28 (0.89)	C (F)
WBTLR	0.46 (0.53)	C (C)	EBT	0.19 (0.16)	C (C)	0.15 (0.16)	C (C)	0.49 (0.72)	D (D)
NBLTR	0.18 (0.52)	A (B)	EBR	0.09 (0.08)	C (C)	0.13 (0.09)	C (C)	0.98 (0.11)	E (D)
SBTLR	0.26 (0.57)	A (B)	WBL	0.20 (0.27)	C (C)	0.44 (0.29)	D (C)	0.97 (0.76)	F (E)
			WBT	0.11 (0.23)	C (C)	0.16 (0.23)	C (C)	0.17 (0.63)	C (C)
			WBR	0.12 (0.20)	C (C)	0.12 (0.25)	C (C)	0.13 (0.33)	C (C)
			NBL	0.16 (0.32)	A (A)	0.20 (0.41)	B (B)	0.55 (0.86)	D (C)
			NBT	0.13 (0.29)	A (A)	0.14 (0.31)	A (A)	0.23 (0.47)	C (B)
			NBR	0.05 (0.06)	A (A)	0.05 (0.08)	A (A)	0.14 (0.35)	C (B)
			SBL	0.29 (0.48)	A (B)	0.32 (0.51)	B (B)	0.57 (0.74)	D (C)
			SBT	0.14 (0.19)	A (A)	0.18 (0.20)	A (A)	0.37 (0.26)	C (B)
			SBR	0.02 (0.07)	A (A)	0.02 (0.07)	A (A)	0.03 (0.09)	C (B)
Overall	0.32 (0.56)	B (B)		0.31 (0.43)	B (B)	0.34 (0.45)	B (B)	0.79 (0.86)	D (C)

6.2.2 Veterans Drive and Salem Road

This arterial intersection, while unsignalized today, is assumed to be signalized once the reconstruction of Veterans Drive has been completed in 2021. The Synchro performance analysis summarized below indicates that this intersection:

- will continue to serve the heavy north-south traffic on Veterans Drive at an excellent level of service of “B” or better
- will serve east-west traffic at a good level of service of “C” or better.

Based on sensitivity testing of building permit absorption due to the four Phase 1 draft plans, this intersection will likely be required two years into Phase 1 development of the Salem Secondary Plan, which is 2020 based on the current development schedule. It can thus be reconstructed (and signalized) as part of the Veterans Drive and McKay Road reconstruction projects, which are scheduled for 2020 through 2021.

Movement	Existing Conditions			Future Background Conditions		Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out	
	Delay (s)	LOS		V/C	LOS	V/C	LOS	V/C	LOS
EBTLR	12.0 (17.5)	B (C)	EBL	0.22 (0.28)	C (C)	0.23 (0.30)	C (C)	0.24 (0.29)	C (C)
WBTLR	10.9 (14.0)	B (B)	EBTR	0.08 (0.05)	C (C)	0.08 (0.05)	C (C)	0.08 (0.05)	C (C)
NBTLR	0.2 (0.50)	A (A)	WBL	0.02 (0.02)	C (C)	0.02 (0.02)	C (C)	0.02 (0.02)	C (C)
SBL	7.8 (8.7)	A (A)	WBTR	0.01 (0.01)	C (C)	0.01 (0.01)	C (C)	0.01 (0.01)	C (C)
SBT	0.0 (0.0)	A (A)	NBL	0.11 (0.31)	A (A)	0.06 (0.35)	A (A)	0.14 (0.30)	A (A)
SBR	0.0 (0.0)	A (A)	NBTR	0.24 (0.35)	A (A)	0.23 (0.38)	A (A)	0.28 (0.46)	A (A)
			SBL	0.01 (0.01)	A (A)	0.01 (0.01)	A (A)	0.01 (0.02)	A (A)
			SBTR	0.19 (0.32)	A (A)	0.18 (0.34)	A (A)	0.30 (0.35)	A (A)
Overall	- (-)	- (-)		0.24 (0.33)	B (B)	0.23 (0.36)	B (A)	0.28 (0.42)	B (B)

6.2.3 Essa Road and Salem Road

This arterial intersection, while unsignalized today, is assumed to be signalized once the reconstruction of both Essa Road and Salem Road has been completed in 2021. The Synchro performance analysis summarized below indicates that this intersection:

- will continue to serve the heavy north-south traffic on Essa Road at an excellent level of service of “B” or better
- will serve east-west traffic at a good level of service of “C” or better.

Movement	Existing Conditions			Future Background Conditions		Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out	
	Delay (s)	LOS		V/C	LOS	V/C	LOS	V/C	LOS
EBTLR	14.0 (21.2)	B (C)	EBL	0.44 (0.19)	D (C)	0.16 (0.22)	C (C)	0.16 (0.19)	C (C)
WBTLR	13.5 (21.1)	B (C)	EBTR	0.21 (0.08)	D (C)	0.08 (0.15)	C (C)	0.08 (0.15)	C (C)
NBL	7.7 (7.9)	A (A)	WBL	0.10 (0.13)	C (C)	0.04 (0.16)	C (C)	0.04 (0.16)	C (C)
NBTR	0.0 (0.0)	A (A)	WBTR	0.14 (0.20)	C (C)	0.07 (0.22)	C (C)	0.07 (0.20)	C (C)
SBL	7.8 (8.6)	A (A)	NBL	0.02 (0.09)	A (A)	0.02 (0.08)	A (A)	0.03 (0.09)	A (A)
SBTR	0.0 (0.0)	A (A)	NBTR	0.41 (0.71)	A (B)	0.50 (0.70)	B (B)	0.64 (0.88)	B (C)
			SBL	0.15 (0.27)	A (A)	0.21 (0.24)	A (A)	0.29 (0.58)	A (C)
			SBTR	0.31 (0.58)	A (B)	0.41 (0.56)	A (A)	0.63 (0.68)	B (B)
Overall	- (-)	- (-)		0.41 (0.58)	A (B)	0.41 (0.59)	B (B)	0.50 (0.72)	B (B)

6.3 MAPLEVIEW DRIVE CORRIDOR INTERSECTIONS

Selected intersections in the Maplevue Drive West corridor have been included in this analysis so as to facilitate assessing the impact of traffic related to this proposed Phase 1 development on the Maplevue Drive Corridor in the vicinity of Highway 400. This assessment has been undertaken in response to concerns that there are currently capacity limitations with respect to traffic in south Barrie accessing the Highway 400 corridor, as well as crossing the corridor.

Work is underway to address these limitations by way of a new crossing of Highway 400 at Harvie Road / Big Bay Point Road (north of Maplevue Drive). At this time this crossing is anticipated to be completed by late 2021. The crossing will provide an alternative route for traffic crossing the Highway 400 corridor in south Barrie, and will thereby relieve the Maplevue Drive corridor.

An assessment has therefore been undertaken of the operations of the intersections of the Highway 400 ramps with Maplevue Drive in the 2021 horizon year.

The actual site traffic added to these intersections from the Phase 1 Salem Draft Plans is minimal, as can be seen in Figure 9. It is also clear from the analysis results summarized below that many of the movements at these intersections are already heavily utilized.

As can be seen by comparing the “Existing Conditions” results with the “Future Background Conditions” results and then with the “Future Total Conditions” results, the most significant reductions in the level of service reported here are a result of the assumed 2% per year growth in corridor background traffic.

The addition of the Phase 1 Salem draft plan traffic has no appreciable impact on the level of service at these key intersections.

Maplevue Drive West and Veterans Road

Movement	Existing Conditions		Future Background Conditions		Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.19 (0.47)	B (C)	0.20 (0.47)	B (C)	0.20 (0.47)	B (C)	0.20 (0.47)	B (C)
EBTR	0.53 (0.54)	C (C)	0.60 (0.61)	C (C)	0.60 (0.61)	C (C)	0.65 (0.66)	C (C)
WBL	0.61 (0.61)	C (C)	0.72 (0.81)	C (C)	0.77 (0.82)	C (C)	0.71 (0.70)	C (C)
WBTR	0.29 (0.73)	C (C)	0.32 (0.81)	C (C)	0.32 (0.81)	C (C)	0.35 (0.87)	C (D)
NBL	0.11 (0.43)	C (C)	0.12 (0.53)	C (C)	0.12 (0.54)	C (C)	0.16 (0.63)	C (C)
NBTR	0.23 (0.69)	C (D)	0.48 (0.92)	C (D)	0.49 (0.97)	C (E)	0.60 (1.25)	C (F)
SBL	0.62 (0.93)	C (E)	0.79 (0.99)	C (E)	0.80 (0.99)	C (E)	0.85 (0.98)	D (E)
SBTR	0.29 (0.40)	C (C)	0.35 (0.61)	C (C)	0.38 (0.61)	C (C)	0.57 (0.76)	C (D)
Overall	0.66 (0.84)	C (C)	0.80 (0.93)	C (D)	0.84 (0.94)	C (D)	0.83 (1.01)	C (E)

Mapleview Drive West and Highway 400 SB On-Ramp

Movement	Existing Conditions		Future Background Conditions		Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBT	0.52 (1.03)	C (E)	0.61 (1.17)	C (F)	0.62 (1.18)	C (F)	0.64 (1.26)	C (F)
EBR	0.17 (0.25)	C (C)	0.17 (0.28)	C (C)	0.17 (0.28)	C (C)	0.17 (0.29)	C (C)
WBL	0.88 (0.59)	D (C)	0.97 (0.60)	E (C)	0.98 (0.60)	E (C)	1.00 (0.59)	E (C)
WBT	0.32 (0.46)	B (B)	0.36 (0.52)	B (B)	0.36 (0.52)	B (B)	0.39 (0.57)	B (B)
SBL	0.58 (0.77)	C (D)	0.58 (0.76)	C (D)	0.58 (0.75)	C (D)	0.58 (0.77)	C (D)
SBR	0.69 (0.72)	C (D)	0.77 (0.86)	D (D)	0.78 (0.87)	D (D)	0.78 (0.78)	D (D)
Overall	0.84 (0.84)	C (D)	0.93 (0.92)	C (E)	0.94 (0.93)	C (E)	0.95 (0.94)	C (E)

Mapleview Drive West and Highway 400 NB On-Ramp

Movement	Existing Conditions		Future Background Conditions		Future Total Conditions (2021) – 14% Build-Out		Future Total Conditions – (2026) – Full Build-Out	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.28 (0.35)	B (B)	0.44 (0.41)	B (C)	0.45 (0.43)	B (C)	0.36 (0.37)	B (C)
EBT	0.42 (0.59)	B (B)	0.46 (0.65)	B (B)	0.46 (0.65)	B (B)	0.51 (0.72)	B (B)
WBT	0.58 (0.88)	C (D)	0.64 (0.97)	C (D)	0.64 (0.97)	C (D)	0.71 (1.07)	C (E)
WBR	0.28 (0.22)	B (C)	0.28 (0.22)	B (C)	0.28 (0.22)	B (C)	0.28 (0.22)	B (C)
NBL	0.28 (0.82)	C (D)	0.28 (0.82)	C (D)	0.28 (0.82)	C (D)	0.28 (0.82)	C (D)
NBR	0.28 (0.81)	C (D)	0.31 (0.81)	C (D)	0.31 (0.79)	C (D)	0.32 (0.79)	C (D)
Overall	0.46 (0.80)	B (C)	0.51 (0.86)	B (C)	0.51 (0.86)	B (C)	0.56 (0.93)	B (D)

7.0 CONCLUSIONS

7.1 SALEM SECONDARY PLAN ROAD NETWORK

This study has tested the currently approved and planned City of Barrie road network in the vicinity of the Salem Secondary Plan under a development scenario comprising four Phase 1 draft plan developments. The horizon years used correspond to the anticipated completion of the Harvie Road – Big Bay Point Road crossing of the Highway 400 corridor (2021) and the anticipated buildout of the largest of the four Phase 1 draft plans (2025). The findings are:

1. The currently planned and approved Salem Secondary Plan road network will perform at an adequate level of service
2. Access intersections for the Watersand draft plan will function at an excellent level of service and do not require additional turning lanes over and above what is ultimately planned as the boundary roads are improved.
3. Signalization of the Watersand Employment draft plan access intersections is not warranted in the early time frame considered in this analysis (2021) but will as development proceeds to buildout.
4. The timing of development of the Watersand draft plan relative to the planned improvements to Veterans Drive mean that the access road intersection improvements will have to be pre-built.
5. The intersections of Salem Road and McKay Road West with Veterans Drive, as well as Essa Road and Salem Road will adequately handle forecast traffic volumes in their ultimate configurations.
6. The timing of the need for these improvements (2020 based on the anticipated Phase 1 development schedule) is consistent with the planned widening and urbanization of McKay Road West, Veterans Drive, Essa Road, and Salem Road in the 2020 to 2021 timeframe.
7. While the Veterans Drive and McKay Road intersection is currently signalized, signalization of the Veterans Drive and Salem Road intersection as well as the Essa Road and Salem Road intersection are assumed to be included as part of the planned improvements.

7.2 MAPLEVIEW DRIVE CORRIDOR AND INTERCHANGE

The four Phase 1 residential draft plans considered in this study are anticipated to have a minimal impact on the Mapleview Drive corridor and Highway 400 interchange. The traffic added to this section of Mapleview Drive by the Phase 1 Salem Draft Plans (as can be seen in Figure 9) is modest, amounting to only about 100 2-way vehicles in the AM peak hour and 140 2-way vehicles in the PM peak hour (per Figure 9)

Traffic operations on many of the movements at the Highway 400 ramp intersections will continue to operate at the low levels of service that they do today.

However, the results of the intersection analysis at these intersections indicate that the traffic attributable to the four Salem Secondary Plan Phase 1 draft plans will have no appreciable impact on the level of service at these key intersections.



APPENDIX A: Traffic Counts



APPENDIX B: Synchro Reports

