Westwood Village (Phase 2) Community
Brian Domm Subdivision
Hallman Subdivision

Preliminary Environmental Noise Assessment

Project Location:

North of Blenheim Road, West of Newman Drive
Township of North Dumfries

Prepared for:

Gatestone Development Corp.
and
Hallman Construction Limited
c/o Mr. Paul Grespan
675 Riverbend Drive
Kitchener, ON N2K 3S3

Prepared by:

MTE Consultants
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

April 19, 2021

MTE File No.: 02534-800

Engineers, Scientists, Surveyors.

STATEMENT

- I am the owner of the property, or the owner's agent, and I understand and agree with the noise attenuation measures proposed in this study entitled Preliminary Environmental Noise Assessment, Westwood Village (Phase 2) Community, North Dumfries, Ontario.

- The application has been designed to avoid the use of berms or walls as noise attenuation features where feasible. Where berms or walls are recommended, the Noise Study provides economic, planning and engineering justification.

- If the application is changed in a way that may affect the noise level calculations, I will have a revised noise study submitted to the Region.

Signed

Dated

Please Print

Title

Contents

Figures

Tables

Appendices

Drawings

1.0 Introduction

1.1 Overview

MTE Consultants Inc. (MTE) was retained by Hallman Construction Limited (Hallman) and Brian Domm (Domm) to complete a Preliminary Environmental Noise Assessment in support of an Official Plan Amendment, Plans of Subdivision, and Zoning By-law Amendment applications. Although separate subdivisions are proposed for each property, the lands have been comprehensively evaluated together to ensure a coordinated approach to the design and development of the Hallman and Domm lands.

The Hallman and Domm lands are located in the Township of North Dumfries and are immediately adjacent to a comprehensively planned community located in the City of Cambridge; commonly referred to as "Westwood Village – Phase 1". The lands owned by Hallman and Domm are generally in the northwestern portion of the Westwood Village Community. Refer to **Figure 1.1** for more details. These lands represent the logical extension and second phase of the Westwood Village Community. For the purpose of this report, the two Draft Plans will be reviewed as one cohesive development herein referred to as the 'subject lands'.

The subject lands comprise a total area of approximately 25.43ha, of which 8.48ha represents the Domm property and 16.95ha represents the Hallman property. Development plans for the subject lands include the construction of street-oriented residential units, multiple residential blocks, park lands, with the required roads, municipal services (storm, sanitary, and water), and open spaces. Draft Plans of Subdivision (dated February 4, 2021) for the proposed developments have been prepared by MHBC Planning and form the basis of this report. The consolidated Draft Plan has been included in **Appendix B**.

The purpose of this study is to determine the noise impacts on the subject lands from Newman Drive, and recommend noise control measures to meet the Ministry of the Environment, Conservation and Parks (MECP) guidelines while satisfying the planning requirements of the Township of North Dumfries, and the Regional Municipality of Waterloo (Region).

1.2 Background Information

A Master Environmental Servicing Plan (MESP) was undertaken for the Cambridge West Community by the City of Cambridge and area landowners. The MESP was completed in November 2013 and approved by City Council on March 17, 2014. The purpose of the MESP was to guide the development of the remaining designated greenfield lands on the west side of the City. The MESP integrated environmental, servicing, transportation, and land use planning components to provide the basis for the preparation of a Community Plan for the Cambridge West Area, and for the preparation and processing of the future development applications.

The MESP outlined the potential noise impacts for the Cambridge West Lands (now Westwood Village Community) from the various sources and appropriate noise control measures to meet the MECP's and the Region's guidelines.

In June 2018, the applications of the adjacent Hallman Subdivision (30T-16104) and Cachet Subdivision (30T-16103) proceeded through the Local Planning Appeal Tribunal (LPAT) as Case No. 170301. The resulting LPAT order provided approval of the two Draft Plans of Subdivision on February 19, 2019.

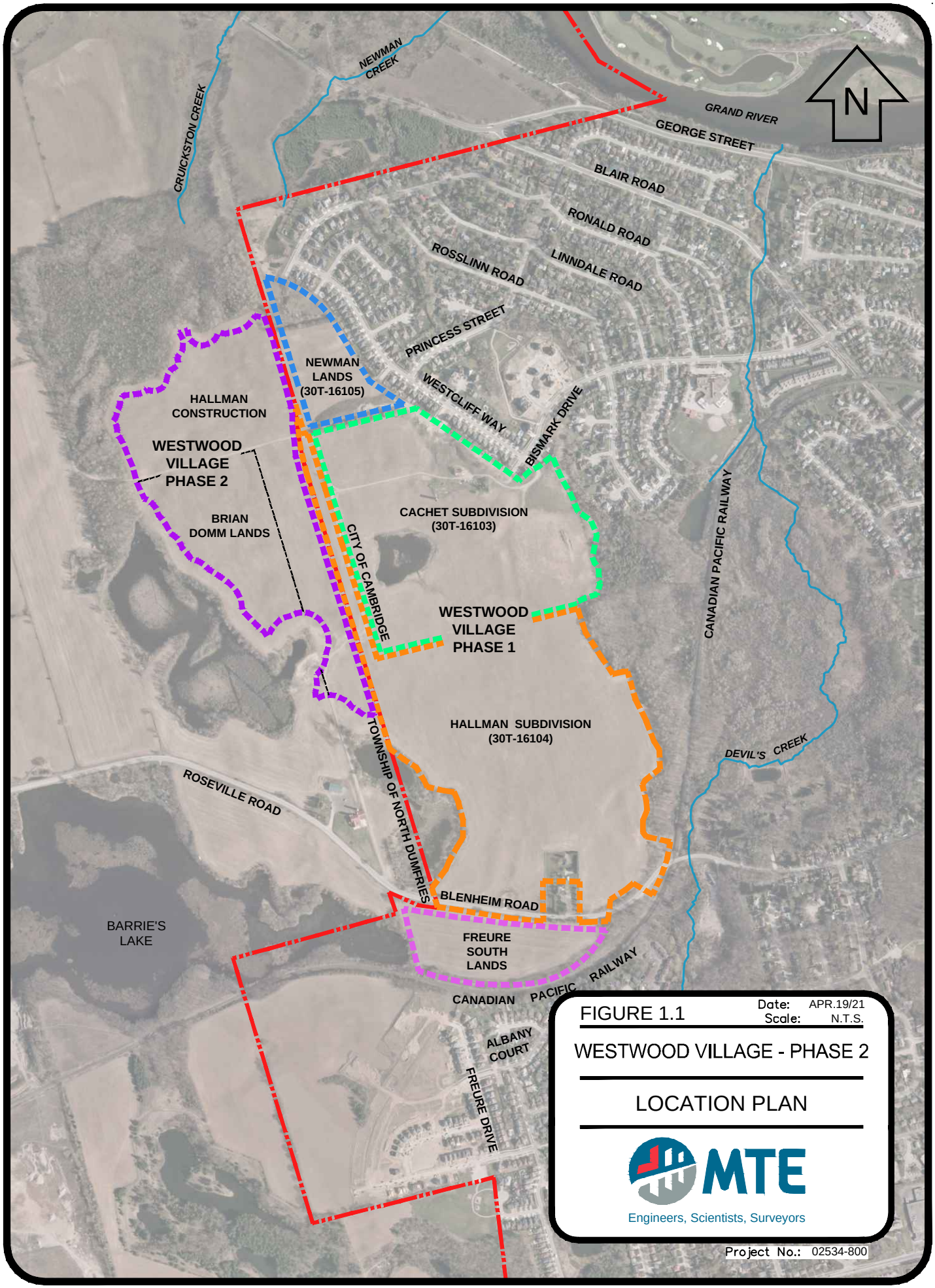


FIGURE 1.1

Date: APR.19/21
Scale: N.T.S.

WESTWOOD VILLAGE - PHASE 2

LOCATION PLAN

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

CAD: P:\P\02534\800\02534-800-P-F1 Project: 02534-800
April 26, 2021 — 1:02 p.m. — Plotted By: CCarre

2.0 Criteria

Environmental Noise Assessments should be in conformance with the current *Noise Assessment Criteria in Land Use Planning Publication LU-131* (MOE, 1997) and *Implementation Guidelines for Noise Policies* (Region, 1999). The Region adopted publication NPC-300: *Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning* (MOE, 2013) upon its release in August, 2013. This report and analysis have been completed using the requirements of NPC-300 and the Region's guidelines.

2.1 Noise Levels for Outdoor Recreation Areas

The recommended outdoor daytime noise levels, taken for Table C-1 in the Publication NPC-300 are:

Usage	Between Hours	Road Noise Levels
Outdoor Amenity Area	07:00 to 23:00	55dBA L_{eq}

Table 2.1 summarizes the noise control measures required for road traffic noise sources.

Table 2.1 – Required Noise Control Measures for Outdoor Living Areas

Daytime (07:00-23:00)	Exceeds Objective By	Noise Control Measures
55dBA or less	0dBA	No requirements or conditions
56-60dBA	1-5dBA	Noise Warning Clause
61+dBA	6+dBA	Alternative Land Use Alternative Draft Plan Designs Barriers

2.2 Indoor Noise Level Limits

Similar to outdoor noise level limits, the recommended indoor noise levels are given in Table C-2 in the Publication NPC-300 are:

Usage	Between Hours	Noise Levels (L_{eq})
		Road
Indoor Living Area	07:00 to 23:00	45dBA
Indoor Living Area (Sleeping Quarters)	23:00 to 07:00	40dBA

Outdoor sound levels (calculated at the plane of window) are used to determine if acoustical mitigation measures are required. **Table 2.2** summarizes control measures, for indoor living area sound levels, based on a 10dBA reduction for a standard wall section applied to the outdoor sound levels due to road traffic.

Table 2.2 – Required Noise Control Measures for Indoor Living Areas

Daytime (07:00-23:00)	Nighttime (23:00-07:00)	Exceeds Objective By	Noise Control Measures
≤ 45dBA	≤ 40dBA	0dBA	No requirements or conditions
46-55dBA	41-50dBA	1-10dBA	Noise Warning Clause Provisions for central A/C
56+dBA	51+dBA	10+dBA	Noise Warning Clause Central A/C installed prior to occupancy Building components designed to achieve indoor sound level criteria

2.3 Calculation Parameters

As previously noted, the allowable outdoor noise level for outdoor living areas is 55dBA with up to 60dBA being allowed with a noise warning clause. The allowable indoor daytime (07:00 - 23:00) and nighttime (23:00 - 07:00) noise levels are 45dBA and 40dBA, respectively. Indoor noise levels are assumed to be 10dBA less than outdoor noise levels, measured at the plane of window, for buildings with standard wall construction.

Daytime and nighttime noise calculations for indoor noise levels at locations which represent the worst-case impact have been included. Since unit plans are not yet available, it is assumed that daytime and nighttime living areas (bedroom or living/dining room) are most conservatively represented at the building envelope face, 4.5m above ground level. Noise levels have also been calculated for outdoor living areas; 3.0m off the building envelope, at a height of 1.5m above ground level.

Proposed finished road grades of 0.5% along Newman Drive are used for this assessment. It should be noted that for this preliminary assessment, unattenuated free-field noise levels were used to determine minimum source-receiver setback line distances from the Newman Drive centreline of road. As such, proposed lot grades are assumed to be relatively flat with respect to the proposed road centreline grades.

3.0 Analysis Procedures

3.1 Road Traffic Data

The road traffic noise sources considered for this analysis include:

- Newman Drive (future extension through the Cachet and Hallman Subdivisions in Westwood Village - Phase 1).

Newman Drive was separated into 2 sections; one north of the southern intersection of Street A and one south of the southern intersection of Street A. Projected traffic volumes for the two sections of Newman Drive were provided by Paradigm Transportation Solutions Limited (Paradigm) as supplementary information to the *Cambridge West Community Transportation Impact Study* (July 2019). These values represent the PM peak hour volumes from trips generated from the entirety of the Cambridge West development; Westwood Village Phases 1 and 2. The traffic volumes are summarized in **Table 3.1 and Table 3.2,** and in an email correspondence with Paradigm in **Appendix C**. The horizon year for this study is 2031. The TIS does not provide the percentage of medium and heavy trucks or the day/night split for the roads within the Westwood Village Community. For the purpose of this report, the distribution of vehicle types used is 1.0% medium trucks and 1.0% heavy trucks with a 90/10 day/night split.

Newman Drive

The 2031 Average Annual Daily Traffic (AADT) is estimated to be:

- 3,715vpd north of the southern intersection of Street A
- 5,360vpd south of the southern intersection of Street A

3.2 Traffic Calculation Methods

Resulting road noise levels were calculated using the Stamson v5.03 computer program approved by the MECP. Daytime and nighttime noise levels were calculated based on a 24-hour volume breakdown. The daytime volume (over 16 hours) is obtained by multiplying the AADT by the fraction of daily traffic expected during the daytime period (i.e. 90%). The nighttime volumes are obtained in a similar manner, except using 10% for expected nighttime traffic (over 8 hours). Noise calculations results are attached in **Appendix D**.

Table 3.1 – Projected 2031 Road Traffic Volumes for Newman Drive (North of southern Street A entrance)

Newman Drive (North of southern Street A entrance)	Projected 2031 AADT – 3,715vpd Speed Limit = 60km/h		
	Cars	Medium Trucks (1.0%)	Heavy Trucks (1.0%)
Daytime Volume (16hr)	3,277	33	33
Nighttime Volume (8hr)	364	4	4

*It should be noted that an average AADT of 3,715vpd was calculated to more conservatively represent the traffic volume fronting the subject lands along Newman Drive. This average is based on 2,070vpd at the northernmost entrance to Newman Drive and 5,360vpd south of the Westwood Village Phase 2 multi-residential block (Hallman Subdivision & Brian Domm Subdivision – Stage 3 – Block 1). Refer to the traffic data in **Appendix C** for more details.

Table 3.2 – Projected 2031 Road Traffic Volumes for Newman Drive (South of southern Street A entrance)

Newman Drive (South of southern Street A entrance)	Projected 2031 AADT – 5,360vpd Speed Limit = 60km/h		
	Cars	Medium Trucks (1.0%)	Heavy Trucks (1.0%)
Daytime Volume (16hr)	4,728	48	48
Nighttime Volume (8hr)	525	5	5

4.0 Results and Analysis

4.1 Noise Level Calculations

This noise report has been completed to determine noise levels for the proposed Westwood Village Phase 2 development and to recommend noise mitigation measures, if required. As previously stated, it is assumed that daytime and nighttime living areas (bedroom or living/dining room) are most conservatively represented at the building envelope face, 4.5m above ground level. Noise levels have also been calculated for outdoor living areas; 3.0m off the building envelope at a height of 1.5m above finished grade. The elevations used are based on proposed finished grades for the development. Stamson output files are attached in **Appendix D**.

It should be noted that Site Plans are not yet finalized for the consolidated multi-residential blocks (Hallman Subdivision – Stage 3 – Block 1 and Brian Domm Subdivision – Stage 3 – Block 1) proposed within the subject lands. An Environmental Noise Assessment may be required for this consolidated block under its respective Site Plan Approval process.

4.1.1 Setback Lines (SBL)

Noise calculations were completed to determine the minimum source-receiver distance to achieve adequate noise attenuation:

- With central A/C, special building components, and a noise warning clause.
- With provisions for central A/C and a noise warning clause.
- With control measures for outdoor living areas and a noise warning clause.
- With a noise warning clause.

The following **Table 4.1** indicates the resulting unattenuated (free-field) noise levels at specific receiver locations within the development. As shown in **Table 4.1**, unattenuated acoustical impacts are such that MECP noise level limits are exceeded within the development. Mitigation measures in the form of noise warning clauses will be required for lots along Newman Drive to notify purchasers of this exceedance. The resulting setbacks lines are identified in **MTE Drawing 02534-800-NA1.1**.

4.1.2 Points of Assessment (POA)

Points of assessment are typically placed in critical locations where the resulting noise levels are expected to be high due to the close proximity to the noise source, or where the thresholds outlined in **Table 2.2** are achieved. They are typically used to assess building component requirements based on elevated noise levels, however, since levels do not exceed 65dBA (daytime) or 60dBA (nighttime), POAs were not modelled for this analysis.

4.1.3 Outdoor Living Areas (OLA)

Similarly, outdoor living area points of assessment are also placed in critical locations where the resulting noise levels are expected to be high due to the close proximity to the noise source, or where the thresholds outlined in **Table 2.1** are achieved. They are typically used to assess noise barrier requirements based on elevated noise levels, however, since levels do not exceed 60dBA during daytime hours, OLAs were not modelled for this analysis.

Resulting Stamson calculations for the Westwood Village Phase 2 lands setback lines are outlined in **Appendix D**.

Table 4.1: SUMMARY OF ROAD NOISE DATA

Noise Source	Max Grade	DAYTIME NOISE LEVELS				NIGHTTIME NOISE LEVELS		
		Outdoor Living Area (OLA)[2]		Indoor POW[1]		Indoor POW[1]		Comments
		Distance from C/L Road to Achieve 55dBA (Lines 1 and 3) (m)	Distance from C/L Road to Achieve 60dBA (m)	Distance from C/L Road to Achieve 55dBA (Lines 2 and 4) (m)	Distance from C/L Road to Achieve 65dBA (m)	Distance from C/L Road to Achieve 50dBA (m)	Distance from C/L Road to Achieve 60dBA (m)	-
Newman Drive - north of southern Street A entrance	0.5%	23.1	< 15.0	24.0	< 15.0	19.6	< 15.0	Daytime governs
Newman Drive - south of southern Street A entrance	0.5%	28.8	< 15.0	30.3	< 15.0	23.9	< 15.0	Daytime governs

Notes:
1 - Assuming standard wall construction (provides 10dBA noise level attenuation).
2 - OLA means Outdoor Living Area (3.0m off building envelope at 1.5m high).

4.2 Mitigation Measures

This noise report has been completed to determine the resulting noise impacts from the future extension of Newman Drive on future homes in the Westwood Village Phase 2 development.

4.2.1 Setback Lines

As previously mentioned, noise calculations were completed to determine the minimum source-receiver distances to achieve adequate noise attenuation. **Table 4.1** above presents a summary of Stamson modelling results for determining minimum setback lines. The results are identified in **MTE Drawing 02534-800-NA1.1**.

The following setback lines describe the required noise control measures at specific distances from the Newman Drive centreline. It should be noted that the descriptions outlined below are specific to that setback line and do not account for multiple attenuation requirements caused by overlapping setback lines. Refer to the requirements outlined in Section 5.0 and in **MTE Drawing 02534-800-NA1.1** for exact block level attenuation measures.

Outdoor Living Areas

Setback Lines 1 and 3 (55dBA)

- A Type A Noise Warning Clause.

Indoor Plane of Window (POW)

Setback Lines 2 and 4 (55dBA) (Daytime Governs)

- Forced air heating with provisions for the installation of central air conditioning and a Type C Noise Warning Clause.

4.2.2 Building Components

As described in Section 4.1.2, an analysis for special building components would only be required if resulting noise levels exceeded 65dBA (daytime) or 60dBA (nighttime). As such, no special building components analysis is required.

4.2.3 Noise Attenuation Barrier

As described in Section 4.1.3, an analysis for noise attenuation barriers would only be required if resulting noise levels exceeded 60dBA at proposed outdoor living areas. As such, no barriers will be required for the subject lands.

4.2.4 Noise Warning Clauses and Ventilation Requirements

Any dwellings proposed between Newman Drive and Setback Lines 2 and 4 exceed the maximum allowable indoor noise level of 45dBA (corresponding to plane of window limits of 55dBA). As such, these dwellings shall be fitted with a forced air heating system to permit for the future installation of central air conditioning and a Type C Noise Warning Clause shall be registered on title.

Similarly, any lots with outdoor living areas proposed between Newman Drive and Setback Lines 1 and 3, will have unattenuated outdoor daytime noise levels greater than 55dBA, which warrants the need for a Type A Noise Warning Clause to be registered on title.

It should be noted that **MTE Drawing 02534-800-NA1.1** indicates blocks which are affected by the setback lines outlined in this report. In reality, depending on proposed lot depths and widths brought forth by amended zoning by-laws, entire blocks or individual lots may not need the aforementioned noise warning clauses. Once lot configuration plans have been created, lot level measures for lots affected by setback lines can be appropriately assigned.

5.0 Conclusions

Based on the foregoing analysis, the following conclusions can be made:

1. An analysis for special building components (windows, walls, doors) designed to achieve indoor sound level criteria is not required for the subject lands.
2. An analysis for attenuating noise barrier requirements is not required for the subject lands.
3. Any lots with outdoor living areas proposed between Newman Drive and Setback Lines 1 and 3 will require a Type A Noise Warning Clause to be registered on title.
4. Forced air heating, as well as provisions for the future installation of central air conditioning by the owner are required for any dwellings built between Newman Drive and Setback Lines 2 and 4. Furthermore, a Type C Noise Warning Clause shall be registered on title.
5. An Environmental Noise Assessment is required for the consolidated multi-residential blocks (Hallman Subdivision – Stage 3 – Block 1 and Brian Domm Subdivision – Stage 3 – Block 1). This analysis would most appropriately be completed at the Site Plan Approval stage and a Draft Plan Condition to this effect is recommended.

Noise Warning Clauses

6. The following noise warning clauses shall be registered on title for the units where the resulting noise level exceeds the recommended criteria. The clauses shall be worded as follows:

Hallman Subdivision – Stage 1 – Blocks 1, 8, 11, and 13

Hallman Subdivision – Stage 2 – Blocks 7 and 8

NWC TYPE C: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

Hallman Subdivision – Stage 1 – Blocks 9 and 12

Hallman Subdivision – Stage 2 – Block 9

NWC TYPE A+C: "Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks. This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

All of which is respectfully submitted,

MTE Consultants Inc.

Charles Carré, P.Eng.
Design Engineer
519-743-6500 ext. 1232
ccarre@mte85.com

Garett Korber, P.Eng.
Design Engineer
519-743-6500 ext. 1292
gkorber@mte85.com

M:\02534\800\02 - Reports\MTE Reports\Environmental Noise Assessment\02534-800_rpt_2021-04-19_Preliminary Environmental Noise Assessment.docx

Appendix A

Statutory Declaration

CONSULTANT STATUTORY DECLARATION

CANADA	)	In the Matter of the
	)	Environmental Protection
PROVINCE OF ONTARIO	)	Act and the Planning Act
	)	And in the Matter of Westwood Village (Phase 2) Community
	)	in the Township of North Dumfries
	)	in the Regional Municipality
	)	of Waterloo

I, Garett Korber, of the City of Kitchener, in the Regional Municipality of Waterloo, SOLEMNLY DECLARE THAT:

1. I am a Licenced Professional Engineer employed by MTE Consultants Inc. which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as Westwood Village (Phase 2) Community, Township of North Dumfries, in the Regional Municipality of Waterloo.
3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the study entitled Preliminary Environmental Noise Assessment, Westwood Village (Phase 2) Community; Township of North Dumfries, Ontario dated April 19, 2021 is the best available information as of the date of the study.
5. The noise level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with the Ministry of the Environment, Conservation and Parks Guidelines (Publication NPC-300 (2013)), Region of Waterloo Guideline for Noise Policies (1999).
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.
7. I acknowledge that this study may be subject to a peer review conducted at my cost.
8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

DECLARED before me in the City of Kitchener,)
in the Regional Municipality of Waterloo)
this 28th day of April, 2021.)

_____

Appendix B

Draft Plans of Subdivision

Notes

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. BOUNDARY INFORMATION FROM PLAN 58R-20976 PREPARED BY MTE ONTARIO LAND SURVEYORS LTD., NOVEMBER 6, 2020.
3. TOPOGRAPHICAL BASE INFORMATION PROVIDED BY MTE.
4. DRIPLINE AND WETLAND INFORMATION PROVIDED BY WSP.
5. ADJACENT PARCEL FABRIC IS APPROXIMATE.

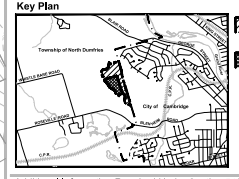
■■■■ DENOTES STAGE LIMITS

CONSOLIDATED DRAFT PLAN OF SUBDIVISION

Legal Description

PART OF LOTS 13 AND 14, CONCESSION 11
AND PART OF ROAD ALLOWANCE BETWEEN CONCESSIONS 11 & 12
TOWNSHIP OF NORTH DUMFRIES
REGIONAL MUNICIPALITY OF WATERLOO

Key Plan



Limits of Hallman Draft Plan

Limits of Domm Draft Plan

SCALE: NTS

Source: SLRN, Region of Waterloo

Additional Information Required Under Section 51(17) of the Planning Act R.S.O. 1990, c.P.13 as Amended

A. AS SHOWN	B. AS SHOWN	C. AS SHOWN
D. RESIDENTIAL, MULTIPLE RESIDENTIAL, PARK, WILDLIFE CORRIDOR		
E. AS SHOWN	F. AS SHOWN	G. AS SHOWN
H. MUNICIPAL WATER SUPPLY	I. LOAM	J. AS SHOWN
K. ALL SERVICES AS REQUIRED	L. AS SHOWN	

Area Schedule - Hallman Construction Limited **30T-_____**

	STAGE 1			STAGE 2		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block	1-13	83-115	2.809	1-9	82-98	3.745
Park	14		0.217			
Emergency Access	15	1-2	0.070	10	1	0.057
Wildlife Corridor	16		0.246			
0.3m Reserve	17-20		0.004	11,12		0.002
Roads			1.121			1.108
Total	**20**	**84-117**	**4.467**	**12**	**83-99**	**4.912**

	STAGE 3			STAGE 4		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block				1-5	37-44	2.024
Multiple Residential/ Consolidation Block	1	59-185	1.857			
Emergency Access				6	1	0.046
0.3m Reserve				7-9		0.005
Roads						0.676
Total	**1**	**59-185**	**1.857**	**9**	**38-45**	**2.751**

	STAGE 5			TOTAL		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block	1-4	47-58	2.542	30	249-315	11.120
Multiple Residential/ Consolidation Block				1	59-185	1.857
Park				1		0.217
Wildlife Corridor				1		0.246
Emergency Access				3	3-4	0.173
0.3m Reserve	5		0.001	10		0.012
Roads			0.417			3.322
Total	**5**	**47-58**	**2.960**	**46**	**311-504**	**16.947**

Area Schedule - Brian Domm **30T-_____**

	STAGE 1			STAGE 2		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block	1-14	88-104	3.669	1-7	26-30	1.469
Park	15,16		0.886	8		0.074
Emergency Access	17,18	5-6	0.302			
Walkway	19		0.018			
0.3m Reserve	20-22		0.003			
Roads			1.415			0.518
Total	**22**	**93-110**	**6.293**	**8**	**26-30**	**2.061**

	STAGE 3			TOTAL		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block				21	114-134	5.138
Multiple Residential/ Consolidation Block	1	0-12	0.126	1	0-12	0.126
Park				3		0.960
Emergency Access				2	5-6	0.302
Walkway				1		0.018
0.3m Reserve				3		0.003
Roads						1.933
Total	**1**	**0-12**	**0.126**	**31**	**119-152**	**8.480**

Total Number of Units Proposed for Entire Plan (Hallman/Domm):430-656

Unit Calculations:

Minimum Unit Yield: 13.716m (45 ft) lots backing onto Open Space
12.192m (40 ft) lots across from those lots backing onto Open Space
10.9728m (36 ft) lots for the remainder
5.5m (18 ft) units from used for street townhouse blocks
Concept Plan used for minimum number of units in multiple blocks

Maximum Unit Yield: 12.192m (40 ft) lots backing onto Open Space
10.9728m (36 ft) lots across from those lots backing onto Open Space
9.0m (30 ft) lots for the remainder
5.5m (18 ft) units from used for street townhouse blocks
100 units/ha used for maximum number of units in multiple blocks

Rev. No.	Date	Issued / Revision	By
1.	Feb.4, 2021	For Submission to Region of Waterloo;	DGS

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
200-540 BINGEMANS CENTRE DR, KITCHENER, ON, N2B 3X9 | P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

Approval Stamp	Date: February 4, 2021
	File No.: 0800C
	Plan Scale: 1:1,250 (36x36)
	Drawn By: D.G.S.
Project: **Westwood Phase 2**	Checked By: P.B.
Applicant: Hallman Construction Limited/ Brian Domm	north
File Name: **DRAFT PLAN**	Dwg No.: 1 of 1
Scale Bar: 0 5 10 25 50 100m	

K:\0800C-Gatestone Developments-North Dumfries Lands\DP\Consolidated Draft Plan February4 2021.dwg

Appendix C

Traffic Data

Charles Carre

Subject: FW: Westwood Phase 2 Traffic Volume Breakdowns

From: Matt Brouwer <mbrouwer@ptsl.com>
Sent: Thursday, April 22, 2021 11:34 AM
To: Charles Carre <CCarre@mte85.com>; Jeff Martens <jmartens@mte85.com>; Garett Korber <gkorber@mte85.com>
Cc: Adam Morrison <amorrison@ptsl.com>
Subject: Westwood Phase 2 Traffic Volume Breakdowns

Here are the AADT volumes estimates (PM peak hour x 10) for Newman, Bismark and Blenheim.

		Total	Phase 2	Phase 1	Other
1	Blenheim Rd west of Bismark Dr	6920	510	1090	5320
2	Blenheim Rd east of Bismark Dr	13130	2650	5160	5320
3	Bismark Dr north of Blenheim Rd	10020	3160	6860	0
4	Bismark Dr entering Phase 1	2470	520	1950	0
5	Newman Dr entering Phase 1	2070	920	1150	0
6	Newman Dr south of Phase 2 multi block	5360	3860	1500	0
7	Newman Dr west of Bismark Dr	6680	3680	3000	0

Matt Brouwer, P.Eng.
Senior Project Manager

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 519.896.3163 x201
m: 519.498.2663
e: mbrouwer@ptsl.com
w: www.ptsl.com

Westwood Village Phase 2
Transportation Impact Study

Paradigm Transportation Solutions Limited

April 2021
Project No.: 180321

ptsl.com

Project Summary

Westwood Village Phase 2 Transportation Impact Study

Project Number
180312

April 2021

Client
Hallman Construction Limited and Brian Domm

c/o MHBC Planning Limited
540 Bingemans Centre Drive,
Suite 200
Kitchener ON N2B 3X9

Client Contact
Paul Britton,
MCIP, RPP

Consultant Project Team
Jim Mallett, M.A.Sc., P.Eng., PTOE
Matt Brouwer, P.Eng.
Adam Morrison, M.A.Sc., P.Eng.

Signing Licencee/Engineer, P.Eng.

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 519.896.3163
905.381.2229
416.479.9684
www.ptsl.com

Version 1.0.0

Disclaimer

Executive Summary

Content

Paradigm Transportation Solutions Limited was retained by Hallman Construction Limited and Brian Domm to conduct this Transportation Impact Study (TIS) as part of a continuation to the previous Westwood Village (Phase 1) Community TIS[1] (previously referred to as Cambridge West Community).

New subdivision plans for Westwood Village Phase 2, which was previously referred to as "Additional Lands" in the previous Westwood Village (Phase 1) Community TIS, has been issued for review. The impact assessment includes an analysis existing traffic conditions, describes the proposed development, forecasts traffic to a 2031 horizon, and recommends improvements to mitigate future traffic conditions. This report also includes a comparison of the conclusions and recommendations from the previous Westwood Village (Phase 1) Community TIS to the findings of this TIS.

Proposed Development

The development is located in the Township of North Dumfries, immediately west of the Westwood Village (Phase 1) Community.

The development is proposed to have the following number of units:

- between 319 and 382 single family units; and
- between 111 and 274 townhouses.

The high-end number of units is used in the analyses contained within this report.

Compared to the "Additional Lands" assumptions in the previous Westwood Village (Phase 1) Community TIS, this is an increase of 62 single family units and 160 townhouses.

Access to the development will be provided entirely through the Westwood Village (Phase 1) Community, connecting to the extension of Newman Drive.

[1] Cambridge West Community; Transportation Impact Study, *Paradigm Transportation Solutions Limited*, July 2019

Conclusions

Based on the investigations carried out, the study has reached the following conclusions:

- Westwood Village Phase 2 is forecast to generate 361 and 462 vehicle trips during the AM and PM peak hour, respectively;
- **Table 6.1** summarizes the movements where levels of service and/or capacity thresholds could be exceeded that warrant mitigation or improvements;
- Left-turn Lanes are warranted at the intersections of:
  - **Roseville Road and Edworthy Sideroad (westbound):** 15 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development.
  - **Blenheim Road and Parkwood Drive (westbound):** 65 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 10 metres of storage length is warranted by the 2031 total traffic conditions.
  - **Blenheim Road and Blair Road (eastbound):** 50 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 20 metres of storage length is warranted by the 2031 total traffic conditions.

TABLE ES.1: SUMMARY OF MOVEMENTS OF INTEREST AND WARRANTED IMPROVEMENTS

Intersection	No.	Issue / Remediation Type	Scenairo	
			Background - including Westwood Village (Phase 1) Community	Total - Westwood Village (Phase 2) Community
Blair Road and George Street North (North)	1	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Park Hill Road and Water Street	4	Identified Movement of Interest[1]	EBLT, NBLT and SBRT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Park Hill Road and Ainslie Street	5	Identified Movement of Interest[1]	EBLT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Roseville Road and Edworthy Side Road	6	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	15 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Parkwood Drive	7	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	75 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Blair Road	8	Identified Movement of Interest[1]	SBLT	SBLT
		Warranted Improvements	None	65 meter eastbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blair Road and George Street North (South)	9	Identified Movement of Interest[1]	EBA, WBA, NBA and SBA	EBA, WBA, NBA and SBA
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control

1 - Movements identified as operating at LOS E or F

Recommendations

This study has identified the following improvements to the transportation network related to the Westwood Village Phase 2 development:

- **Blair Road and George Street North (North Intersection):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals;
- **Roseville Road and Edworthy Side Road:** It is recommended that an auxiliary westbound left-turn lane with a 15 metre storage length be constructed, regardless of whether the subject development is built;
- **Blenheim Road and Parkwood Drive:** It is recommended that an auxiliary westbound left-turn lane with a 75 metre storage length be constructed. 65 metres of the storage length is warranted regardless of whether the subject development is built;
- **Blenheim Road and Blair Road:** It is recommended that an auxiliary eastbound left-turn lane with a 70 metre storage length be constructed. 50 metres of the storage length is warranted regardless of whether the subject development is built; and
- **Blair Road and George Street North (9):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals.

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited was retained by Hallman Construction Limited and Brian Domm to conduct this Transportation Impact Study (TIS) for a proposed Westwood Village Phase 2 residential development. This development is located in the Township of North Dumfries, immediately west of the Westwood Village (Phase 1) Community (previously referred to as Cambridge West Community Plan). This development was previously considered in the Westwood Village (Phase 1) Community TIS as "Additional Lands".

Access to the development will be provided entirely through the Westwood Village (Phase 1) Community, connecting to the extension of Newman Drive.

1.2 Westwood Village (Phase 1) Community

The Westwood Village (Phase 1) Community TIS[2] was completed by Paradigm in July 2019 to evaluate the transportation impacts of the proposed development, including Westwood Village Phase 2, which was referred to as "Additional Lands". The study concluded that the Westwood Village (Phase 1) Community could be accommodated by the transportation network with the following recommendations:

- For the Region of Waterloo to continue monitoring the intersection of Blair Road and George Street North (North Intersection) to review the need for enhanced traffic control.
- Lane reconfigurations at the intersections of Park Hill Road West and Water Street North, and Park Hill Road West and Ainslie Street North.
- A roundabout be constructed at the intersection of the realigned Blenheim Road and the extension of Bismark Drive.
- A westbound left-turn lane with 25 metres of storage length on Blenheim Road at what was referred to as Street G.

The July 2019 TIS assumed the development of the "Additional Lands" would include 320 single detached homes and 114 townhouses. With the traffic generated by the "Additional Lands", the Cambridge West TIS noted that the intersection of Blair Road and George Street North (South Intersection) is forecast to warrant a signal at the assumed level

[2] Cambridge West Community: Transportation Impact Study, *Paradigm Transportation Solutions Limited,* July 2019

of development and should be further analysed in the TIS specific for the Additional Lands. No further improvements were anticipated.

The TIS for Westwood Village Phase 1 was approved by the Region of Waterloo and City of Cambridge.

1.3 Study Purpose

Paradigm has been retained by the landowners to conduct this Transportation Impact Study for the Westwood Village Phase 2 development. This study has been prepared in accordance with the requirements detailed by the Regional Municipality of Waterloo (RMOW or Region) in its Transportation Impact Study Guidelines[3]. It is noted that the City of Cambridge (City) and Township of North Dumfries (Township) also follow these guidelines and supplements with additional requirements of its own, through their TIS guidelines. The City, Township and the Region were consulted in accordance with the requirements of the process to confirm the study scope. A pre-study consultation was held to confirm the required scope of work. **Appendix A** contains the detailed pre-study conference notes.

The purpose of the study is to determine the impact of the development traffic on the surrounding road network and the improvements required to accommodate this future traffic. The scope of the study includes determination of the current traffic and site conditions in the vicinity of the proposed development, estimates of background traffic growth in the area, estimates of the additional traffic that will be generated by the development, analyses of the impact of the additional traffic and recommendations on the remedial measures necessary to accommodate the future traffic in a satisfactory manner.

1.4 Study Terms of Reference and Scope

Based on the consultation with City, Township and Regional staff, the following assumptions guided the development of this report:

- The analysis horizon will use the same ultimate horizon year from the Westwood Village (Phase 1) Community TIS (2031); and
- AM and PM peak hours were analyzed to assess traffic operations.

The study area would include the following intersections:

[3] Transportation Impact Study Guidelines, *Regional Municipality of Waterloo*, July 2014

- Blair Road & George Street North (North) (1);
- Blair Road & Princess Street (2);
- Blair Road & Bismark Drive (3);
- Water Street & Park Hill Road (4);
- Ainslie Street & Park Hill Road (5);
- Roseville Road & Edworthy Side Road (6);
- Blenheim Road & Parkwood Drive (7);
- Blair Road & Blenheim Road (8); and
- Blair Road & George Street North (South) (9).

The inclusion of the intersections noted above were based on the outcome of the Westwood Village (Phase 1) Community TIS and included the intersections for which improvements were recommended, or for which had movements forecast to have operational issues.

Figure 1.1 details the locations of these intersections, including the location of the subject development.

1. Blair Road and George Street North
2. Blair Road and Princess Street
3. Blair Road and Bismark Drive
4. Park Hill Road and Water Street
5. Park Hill Road and Ainslie Street
6. Roseville Road and Edworthy Side Road
7. Blenheim Road and Parkwood Drive
8. Blenheim Road and Blair Road
9. Blair Road and George Street North

paradigm TRANSPORTATION SOLUTIONS LIMITED

Study Area and Subject Development Location

Westwood Village Phase 2
180312

Figure 1.1

2 Existing Conditions

This section documents current traffic conditions, operational deficiencies, and constraints experienced by the public travelling within the study area.

2.1 Existing Road Network

The primary roads within the study area include:

- **Water Street** is a two-lane Regional arterial road south of its intersection with Ainslie Street, north of this intersection it is a four-lane road. The posted speed limit within the study area is 50 km/hr. It provides access to the south and west including Paris, Brantford and Highway 403 and to the north including downtown Cambridge, central Cambridge and Highway 401;
- **Ainslie Street** is a two-lane Regional arterial road south of its intersection with Water Street. The posted speed limit within the study area is 50 km/hr. It provides access to the south and west including Paris, Brantford and Highway 403 and to the north including downtown Cambridge, central Cambridge and Highway 401;
- **George Street North** is a two-lane Regional Arterial road. The posted speed limit within the study area is 60 km/hr between Blair Road and Sunset Boulevard, and 50 km/hr to the south of Sunset Boulevard. George Street North ends within the study area at Blair Road. George Street links Blair Road to Downtown Cambridge and provides access to the north onto Highway 401, north and west Cambridge, and Kitchener.
- **Blair Road** is a two-lane road. According to the City of Cambridge Official Plan[4], Blair Road is classed as a collector road within the City Limits south of its intersection with George Street North. North of this location it is classed as an arterial road. The posted speed limit within the study area is 50 km/hr. Blair Road provides access to the north onto Highway 401, north and west Cambridge, and Kitchener. Blair Road ends within the study area at Blenheim Road.
- **Park Hill Road** is a four-lane Regional arterial road between George Street North and Ainslie Street North. The posted speed limit within the study area is 50 km/hr. Park Hill Road links West Cambridge to Downtown Cambridge.

[4] City of Cambridge Official Plan, Map 7A, page 246, City of Cambridge. 2013

- **Blenheim Road** is a two-lane collector road. The posted speed limit within City of Cambridge in the study area is 50 km/hr, to the west in the Township of North Dumfries through Brown's subdivision it is posted at 60 km/h and further west (west of Edworthy Side Road) increases to 80 km/h. Blenheim Road provides access to the west and north (Highway 401, north and west Cambridge, and Kitchener) and to the east (Downtown Cambridge, Central Cambridge, Highway 24, Franklin Boulevard and Highway 401).

It is noted that the realignment of Blenheim Road and Bismark Drive, and the construction of the roundabout at the intersection of these two roads are currently underway. These improvements will be considered under all future analysis.

The following streets are classified as City of Cambridge collector streets within the study area. These streets function to provide access to the surrounding Regional arterial road network from the adjacent land uses:

- Princess Street (Rosslinn to Blair);
- Bismark Drive (Rosslinn to Blair); and
- Parkhill Road West (Blair Road to George Street).

The study area is primarily bordered by residential developments to north, south and east. Further to the east is downtown Galt and commercial developments. To the west are primarily agricultural lands within the Township of North Dumfries.

Figure 2.1 displays the existing lane configuration and traffic controls of intersections within the study area.

2.2 Existing Pedestrian & Cyclist Facilities

Within the Study Area sidewalks currently exist on both sides of Westcliff Way, Newman Drive, Princess Street, and Bismark Drive and only on one side of Blair Road. Sidewalks are planned in the Westwood Village (Phase 1) Community.

There are no dedicated on-road cycling facilities within the Study Area. The Devil's Creek Trail, an off-road facility, travels north-south through the eastern end of the study area. The trail crosses Bismark Drive between Leslie Avenue and Blair Road and then crosses Blair Road between Clearview Drive and Esther Avenue. Since the subject lands and the Westwood Village (Phase 1) Community are currently undeveloped, no sidewalks or trails have been built on them.

2.3 Existing Transit Service

The subject lands are not currently serviced by Grand River Transit. However, the Phase 1 and Phase 2 communities are planned to exceed the minimum greenfield density targets to support the introduction/extension of transit to the community.

Figure 2.2 displays the following routes which GRT serves in the wider study area:

- **iXpress/iON Bus** services the King Street corridor throughout Kitchener and Waterloo via King Street and on to Cambridge, and operates on 15-minute headways; and
- **Route 57** runs from the Ainslie Street terminal in downtown Galt, along Blair Road and Westcliff Way and operates on 30-minute headways.

2.4 Existing Traffic Volumes

Paradigm Transportation Solutions Limited collected traffic volume data during October 2018 for the intersections within the study area.

Figure 2.3 and **Figure 2.4** shown the existing AM and PM peak hour traffic volumes, respectively.

1. Laurelwood Drive and Bearinger Road/Fisher Hallman Road
2. Conservation Drive and Westmount Road
3. Benjamin Road and Westmount Road
4. Benjamin Road and Kressler Road
5. Erbsville Road and Kressler Road
6. Erbsville Road and Conservation Drive
7. Erbsville Road and Laurelwood Drive
8. Beaver Creek Road and Laurelwood Drive
9. Benjamin Road and Bisch Street

Westwood Village (Phase 2) Development Area

Westwood Village (Phase 1) Community

George Street North

Bismark Drive

Blair Road

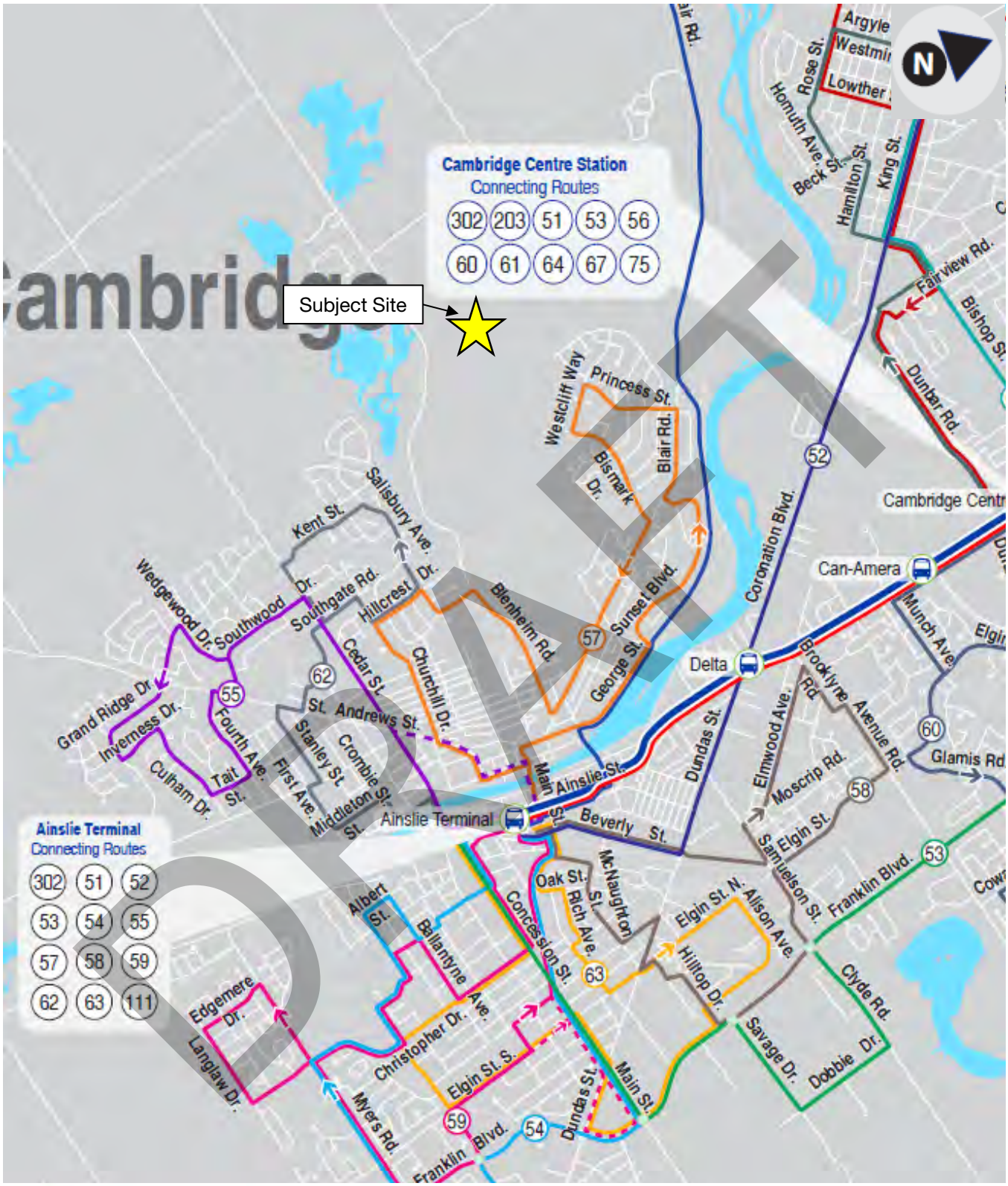
Roseville Road

Blenheim Road

Park Hill Road

paradigm TRANSPORTATION SOLUTIONS LIMITED

Existing Lane Configurations and Traffic Control

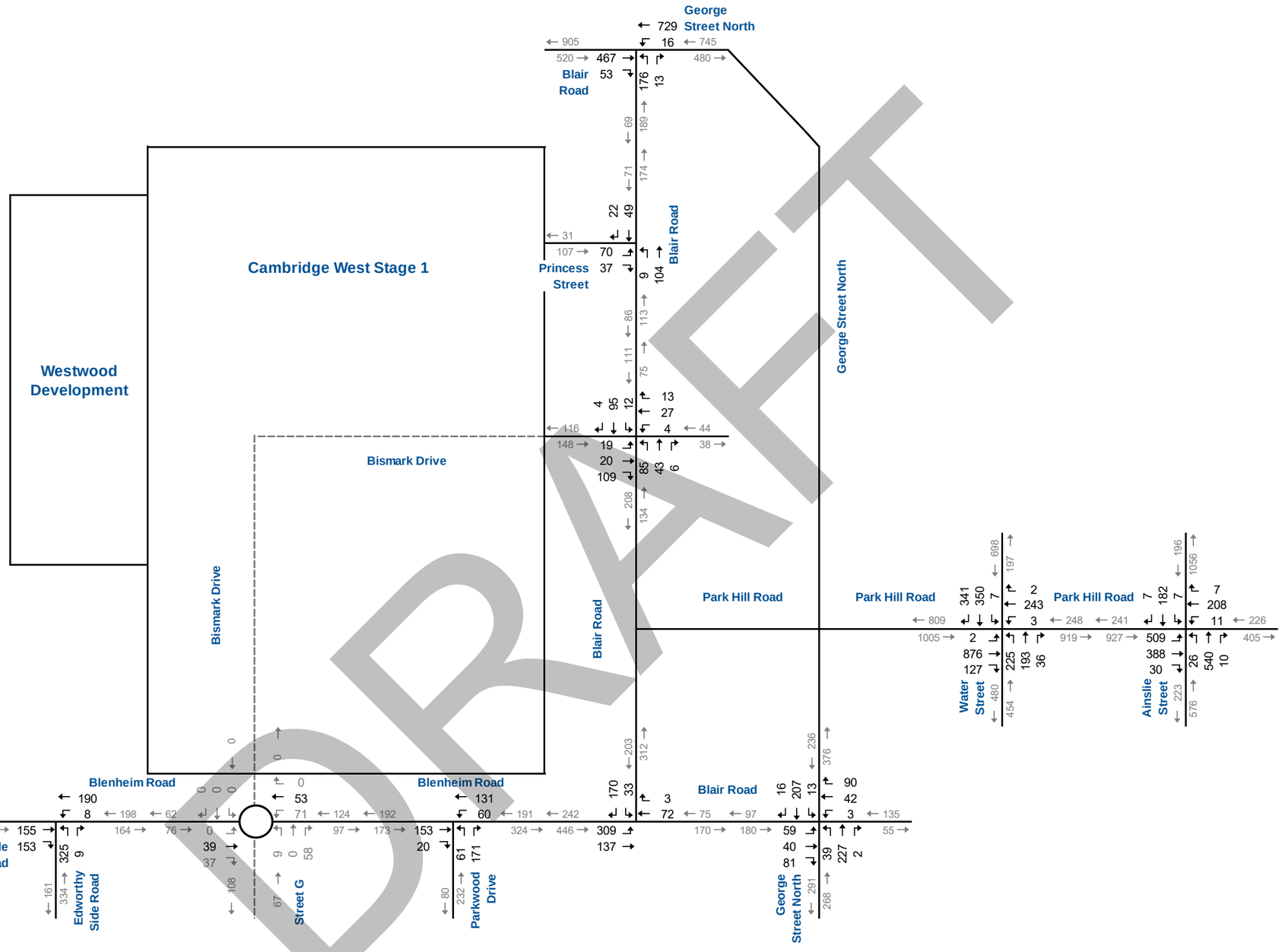


paradigm TRANSPORTATION SOLUTIONS LIMITED

Existing Transit Network

Westwood Village Phase 2
180312

Figure 2.2

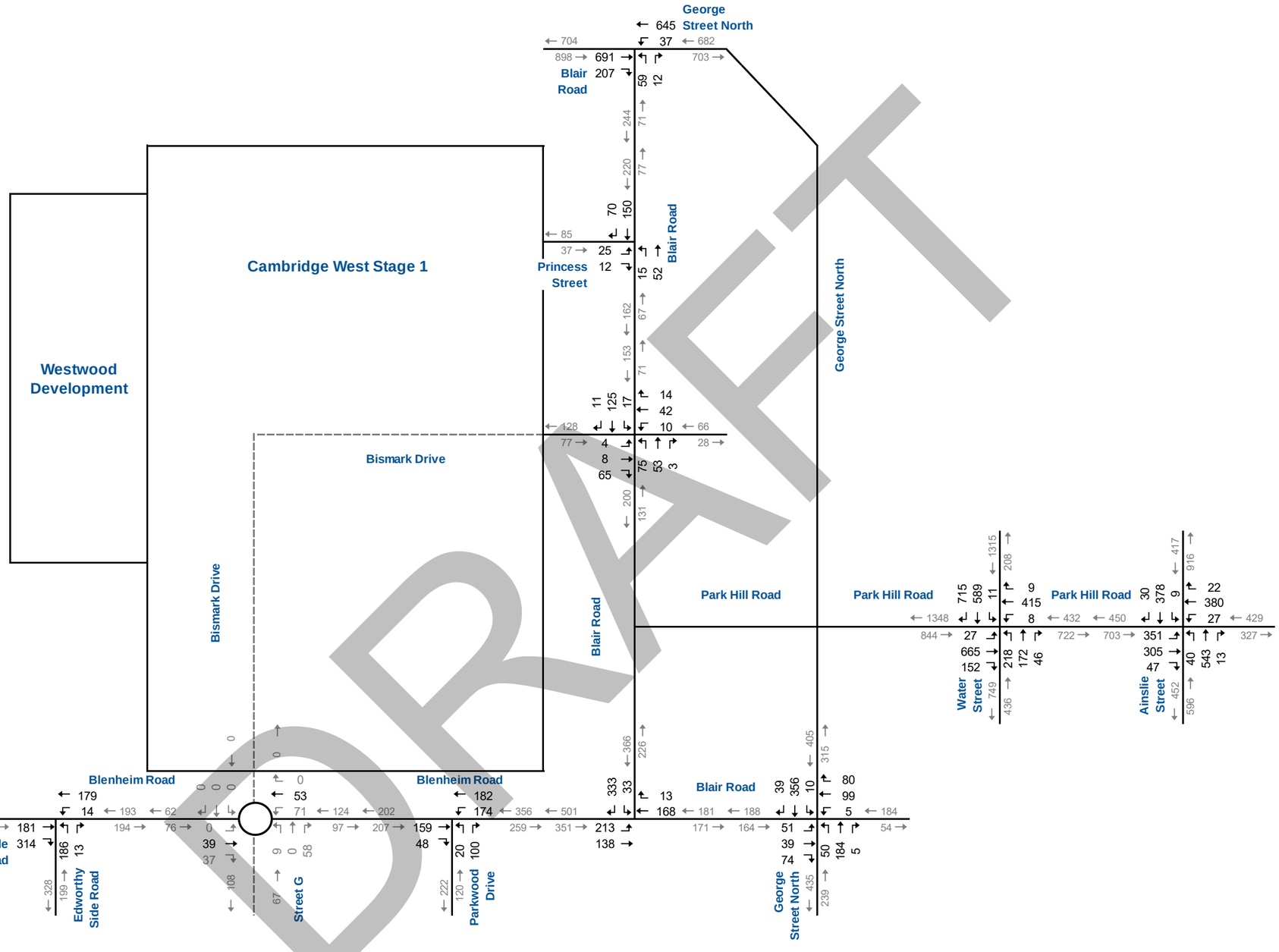


paradigm TRANSPORTATION SOLUTIONS LIMITED

Existing Traffic Volumes – AM Peak

Westwood Village Phase 2
180312

Figure 2.3



Existing Traffic Volumes – PM Peak

Figure 2.4

2.5 Intersection Operational Assessments

The operations of the intersections in the study area were evaluated using the existing lane configurations, traffic controls and the existing traffic peak volumes.

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows. The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections (50 seconds at unsignalized intersections), the movement is considered to have a LOS F and remedial measures are usually implemented, if they are feasible.

The level of service conditions on the existing road network have been assessed using Synchro 10. The criteria, as defined by the Region of Waterloo, for identifying “critical” intersections are:

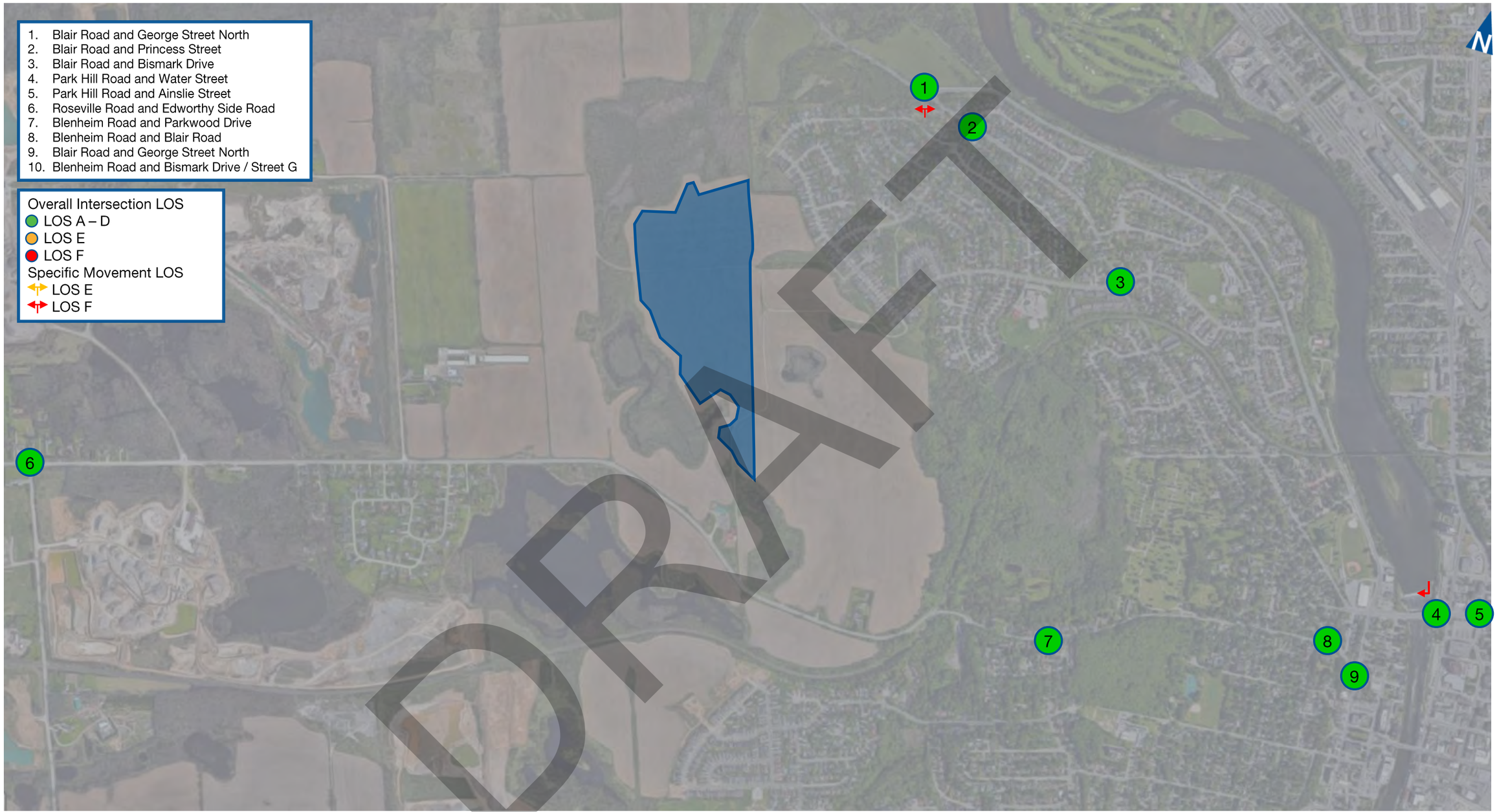
- overall Level of Service E or F (i.e. average control delay per vehicle greater than 55 seconds) for signalized intersections; and
- overall Level of Service E or F (i.e. average control delay per vehicle greater than 35 seconds) for unsignalized intersections.

As well, the criteria for identifying individual “critical” movements are:

- the average control delay for individual movements is greater that 55 seconds;
- estimated 95th percentile queue length for an exclusive movement exceeds the available storage space;
- estimated 95th percentile queue length for an individual movement will block an existing access;
- exclusive turning lanes are inaccessible because of queue lengths in adjacent through lanes; and
- poor quality of service for non-auto modes.

Figure 2.5 and **Figure 2.6** summarizes the level of service and other performance results during the AM and PM peak hours, respectively. **Appendix B** contains the detailed Synchro reports.

The analyses indicate that all intersections and individual movements within the study area are currently operating at acceptable levels of service.

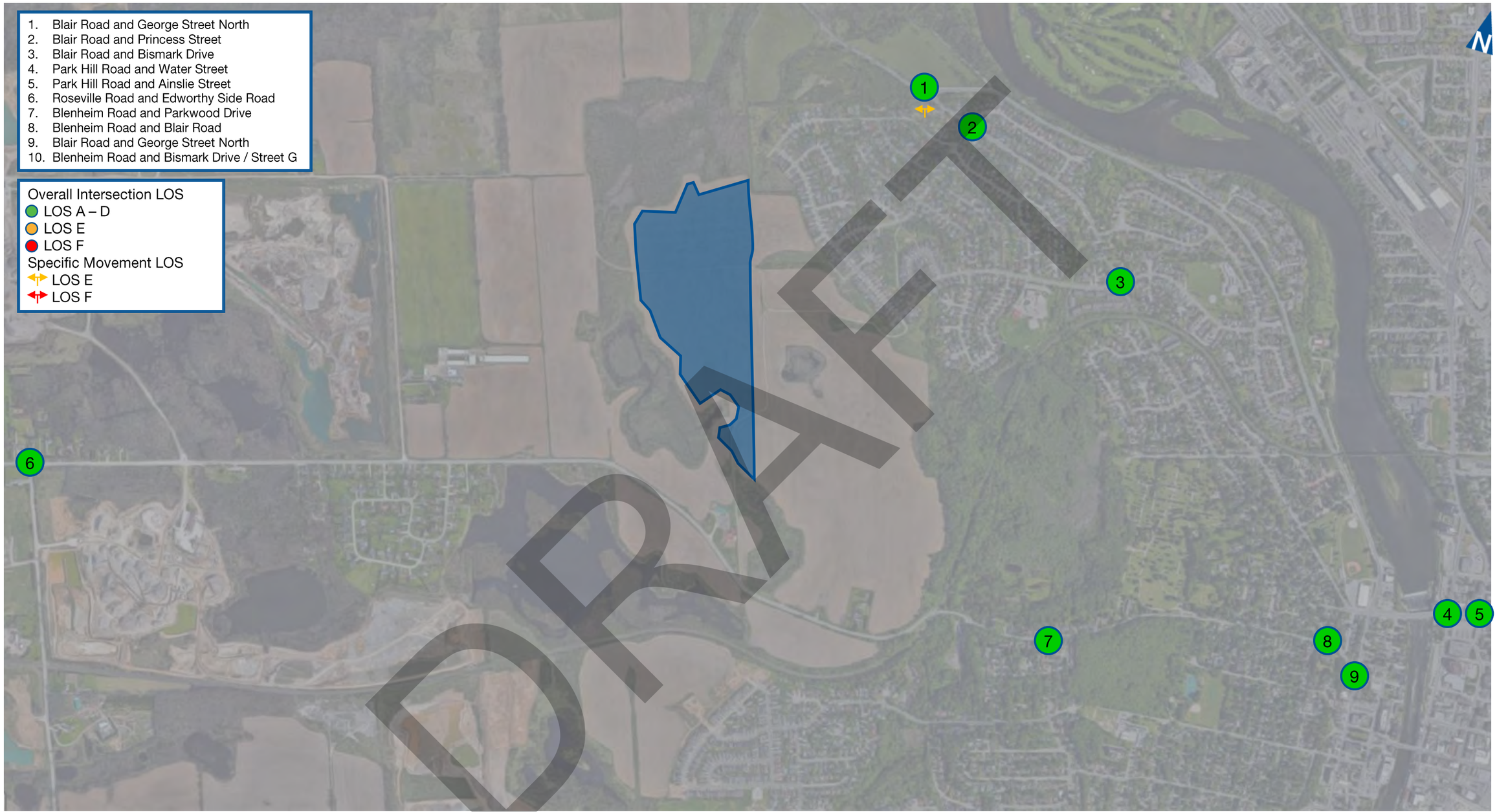


paradigm TRANSPORTATION SOLUTIONS LIMITED

Existing Traffic Operations – AM Peak

Westwood Village Phase 2
180312

Figure 2.5



paradigm TRANSPORTATION SOLUTIONS LIMITED

Existing Traffic Operations – PM Peak

Westwood Village Phase 2
180312

Figure 2.6

3 Development Concept

3.1 Development Description

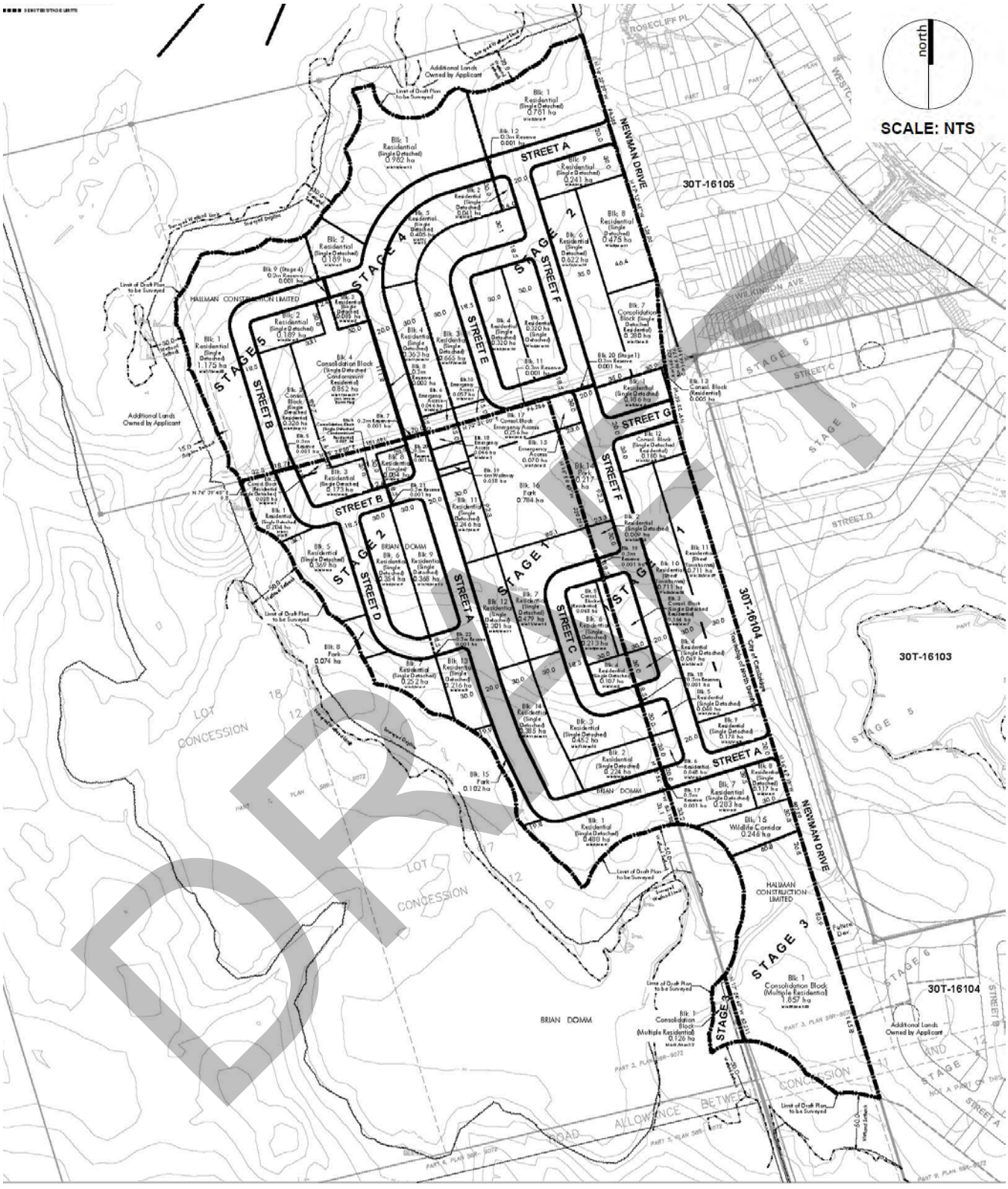
The subject development consists of multiple housing blocks, for a total of:

- between 319 and 382 single family units; and
- between 111 and 274 townhouses.

For the purposes of analyses, the high-end number of units is used in this report and thus should be considered a conservative approach to forecasting trips generated by the development. The difference between the high-end number of units and what was assumed in the July 2019 TIS for Westwood Village (Phase 1) is 62 single family units and 160 townhouse units.

Access to the development will be provided entirely through the Westwood Village (Phase 1) Community and the proposed subdivisions will connect directly to the extension of Newman Drive.

Figure 3.1 shows the proposed site plan.



Proposed Subdivision Plans

Westwood Village Phase 2
180312

Figure 3.1

3.2 Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation rates and equations were used to estimate the peak hour site-generate traffic volumes. Land Use Codes (LUC) 210 (Single-Family Detached Housing) and 220 (Low-Rise Apartment) were used in this study. This results in 361 and 462 new trips forecast to be generated in the AM and PM peaks, respectively. This is 104 and 123 additional trips compared to the assumed development in the Westwood Village (Phase 1) Community TIS.

- **LUC 210 (Single-Family Detached Housing):** Single-family detached housing includes all single-family detached homes on individual lots.
- **LUC 220 (Multifamily Housing (Low-Rise)):** Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors).

For the purposes of forecasting in this study, full buildout of the site is forecast to occur by 2031.

TABLE 3.1: TRIP GENERATION

Land Use Code	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
210: Single-Family Detached Housing	382 Units	*	69	207	276	**	232	136	368
220: Multifamily Housing (Low-Rise)	274 Units	***	29	96	125	****	91	54	145
Total Trips			*98*	*303*	*401*		*323*	*190*	*513*
Total Mode Share Reductions		*10%*	*10*	*30*	*40*	*10%*	*32*	*19*	*51*
Total Net Trips			***88***	***273***	***361***		***291***	***171***	***462***

** Trip = 0.71X + 4.80* **** Ln(Trip) = 0.95Ln(X) - 0.51*

*** Ln(Trip) = 0.96Ln(X) + 0.20* ***** Ln(Trip) = 0.89Ln(X) - 0.02*

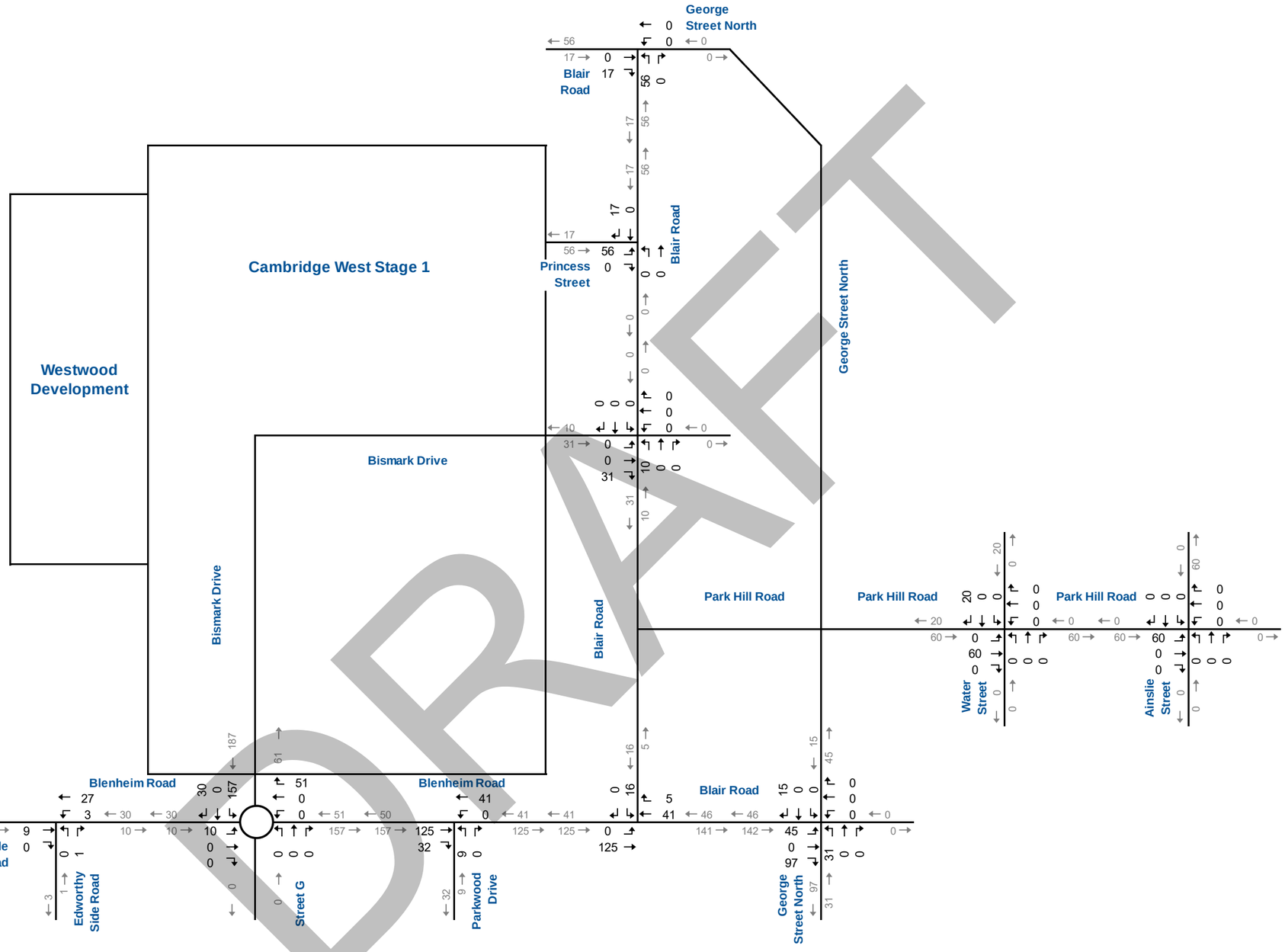
3.3 Trip Distribution and Assignment

The Westwood Village (Phase 1) Community TIS trip distribution, determined using the Transportation Tomorrow Survey (TTS) for the likely distribution of trips to / from the subject site, was used to determine the trip distribution for this TIS. **Table 3.2** summarizes the TTS trip distribution. The distribution is the same as what was used in the Westwood Village (Phase 1) Community TIS.

TABLE 3.2: TRIP DISTRIBUTION

Direction	Distribution
North via George Street	20%
North via Ainslie/Water	22%
South via George Street	24%
West via Roseville Road	11%
Internal Roads	23%
Total	***100%***

Figure 3.2 and **Figure 3.3** illustrate the site generated traffic for the AM and PM peak hours, respectively.

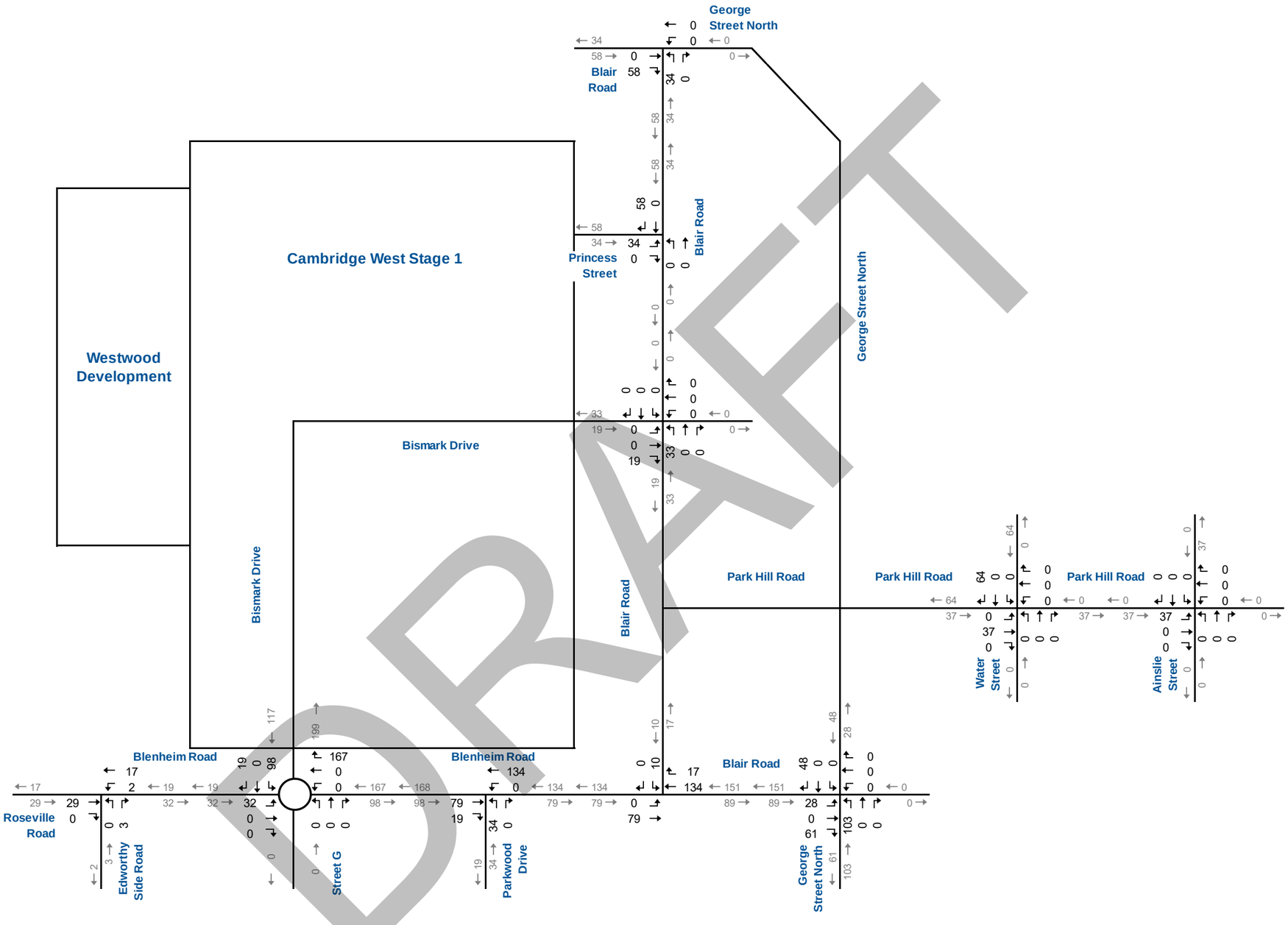


paradigm TRANSPORTATION SOLUTIONS LIMITED

Site Generated Traffic Volumes – AM Peak

Westwood Village Phase 2
180312

Figure 3.2



paradigm TRANSPORTATION SOLUTIONS LIMITED

Site Generated Traffic Volumes – PM Peak

Westwood Village Phase 2
180312

Figure 3.3

4 Evaluation of Future Traffic Conditions

Future traffic conditions assessed include estimates of future background and total traffic analysis for the 2031 horizon. The future traffic volumes near the development will likely consist of increased non-site traffic volumes (background traffic), and the traffic forecast to be generated by the proposed development. The background growth rate used in this study is the same as what was used in the Westwood Village (Phase 1) Community TIS, which was confirmed in the pre-study consultation. The growth rate on Blenheim Road is assumed to be 1.5% per year and the growth rate in the remainder of the study area was assumed to be 0.5%. These rates were based on the recommendations of the Region of Waterloo, based on their transportation model for the area.

4.0.1 Background Development Traffic

Trips generated by the Westwood Village (Phase 1) Community and the background developments discussed in that TIS were included in the background development traffic for this study.

Also included in the background traffic were forecasts for additional growth in the Downtown Galt area to account for an additional 382 person, specifically from the Gaslight development. This additional growth was also included in the background traffic forecasts of the Westwood Village (Phase 1) Community TIS.

Figure 4.1 displays the Westwood Village (Phase 1) Community Area.

4.0.2 Background Intersection Improvements

As noted in **Section 3**, the intersection of **Blenheim Road and Bismark Drive / Street G** is proposed as a roundabout intersection and is planned to be constructed under the Westwood Village (Phase 1) Community. As such, it will be considered as a roundabout intersection for the 2031 background and total traffic horizons.

Additionally, as the Westwood Village (Phase 1) Community TIS was approved, the intersection improvements recommended are assumed to be implemented as a part of the 2031 future conditions. Specifically, the improvements of:

- **Water Street and Park Hill Road:** Reconfigure the westbound through/left-turn lane and a separate right-turn lane, and a southbound channelized right-turn lane. Appropriate signal timings should be developed to maintain acceptable levels of service and queue lengths; and

- **Ainslie Street and Park Hill Road:** Installation of an eastbound dual left-turn configuration and separate westbound left-turn lane. Appropriate signal timings should be developed to maintain acceptable levels of service and queue lengths.

4.1 2031 Horizon

4.1.1 Background Traffic Operations

Based on the estimated 2031 background traffic volumes, Level of Service analyses have been conducted using Synchro 10, for the weekday AM and PM peak hour conditions for the intersections in the study area. Signalized intersections were optimized for movement splits, no other improvements were considered.

Figure 4.2 and **Figure 4.3** displays the 2031 background traffic volumes for the weekday AM and PM peak hours, respectively.

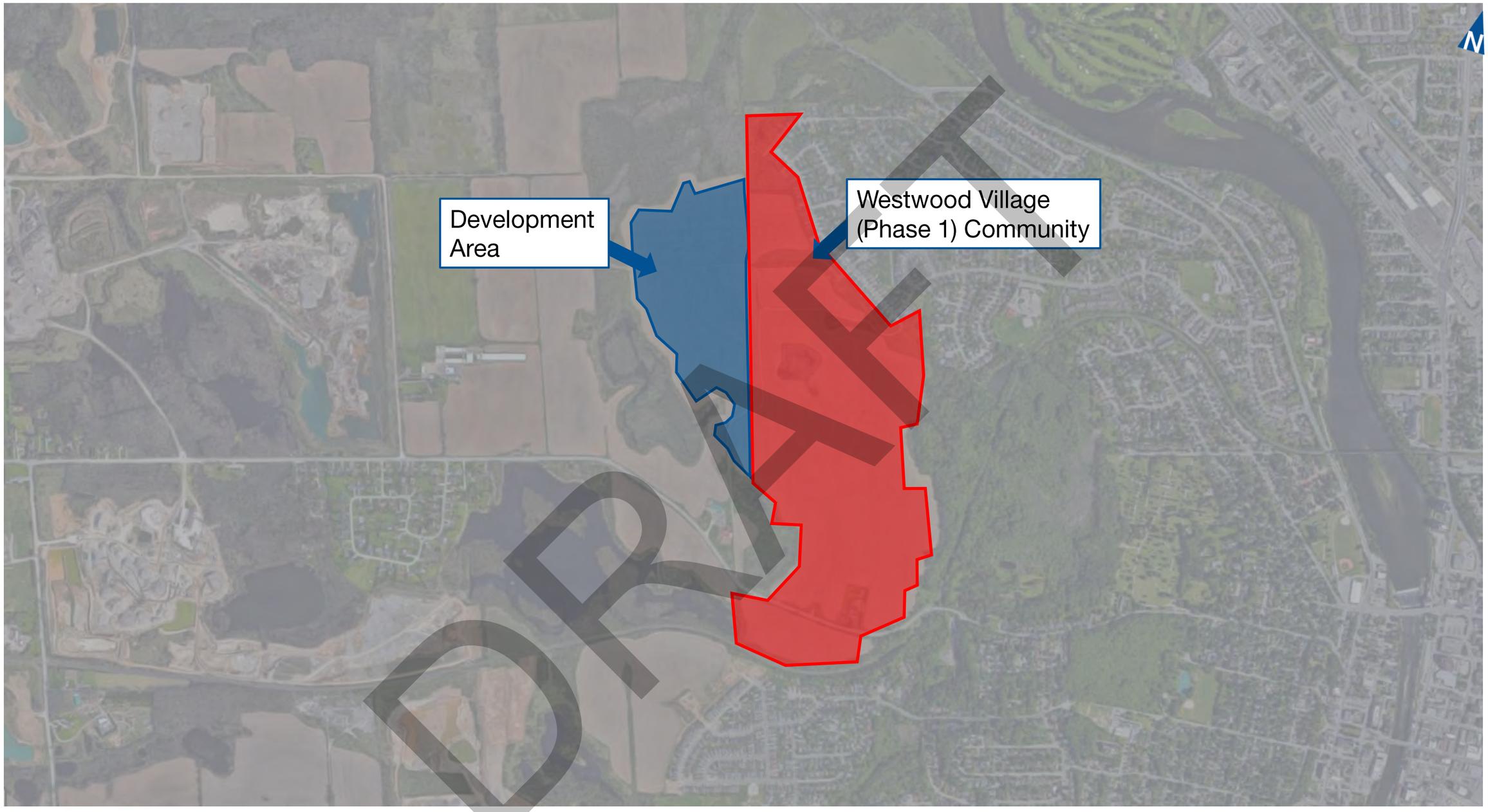
Figure 4.4 and **Figure 4.5** summarizes the results of the analysis indicating the levels of service (LOS) experienced at the study area intersections.

Most observed intersections have acceptable operational values except for the following intersections and critical movements:

- **Blair Road and George Street North (North Intersection):** The northbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. Overall, the intersection is forecast to operate at a LOS F during the PM peak hour;
- **Water Street and Park Hill Road:** The northbound left-turn movement is forecast to operate at a LOS E during the PM peak hour;
- **Roseville Road and Edworthy Side Road:** The northbound shared movement is forecast to operate at a LOS F and a LOS E during the AM and PM peak hour, respectively;
- **Blenheim Road and Parkwood Drive:** The northbound shared movement is forecast to operate at a LOS F during both peak hours, and with a v/c greater than 1.0 during the PM peak hour. Overall, the intersection is forecast to operate at a LOS F during the PM peak hour;
- **Blenheim Road and Blair Road:** The southbound shared movement is forecast to operate at a LOS F during the PM peak hour; and

- **Blair Road and George Street North (South Intersection):** The eastbound shared movement is forecast to operate at a LOS F during both peak hours, and with a v/c greater than 1.0 during the PM peak hour. The westbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during the PM peak hour. The southbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during the PM peak hour. Overall, the intersection is forecast to operate at a LOS E and LOS F during the AM and PM peak hour, respectively.

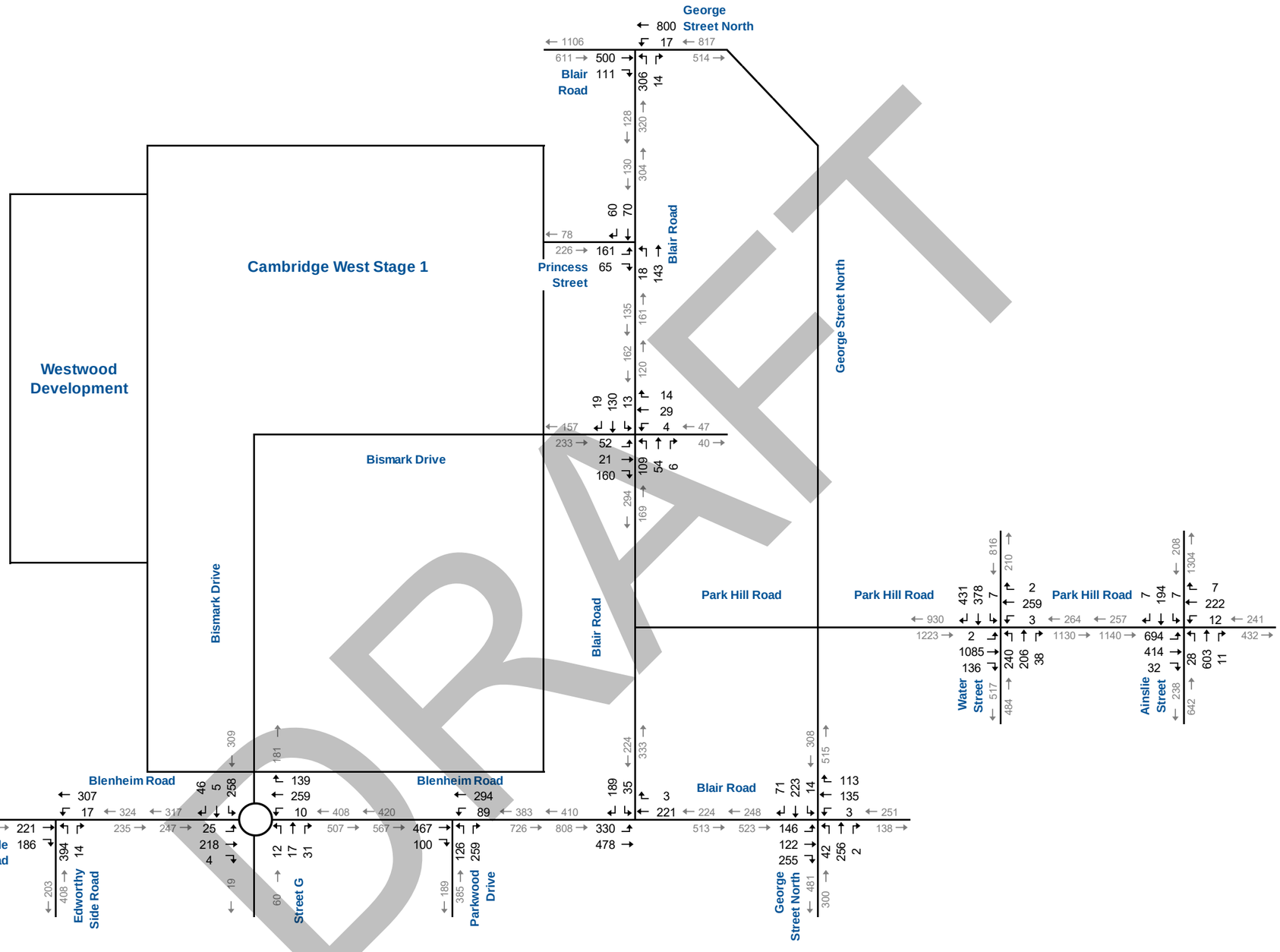
Appendix C includes the detailed Synchro 10 reports.



paradigm TRANSPORTATION SOLUTIONS LIMITED

Westwood Village (Phase 1) Community Area

Figure 4.1

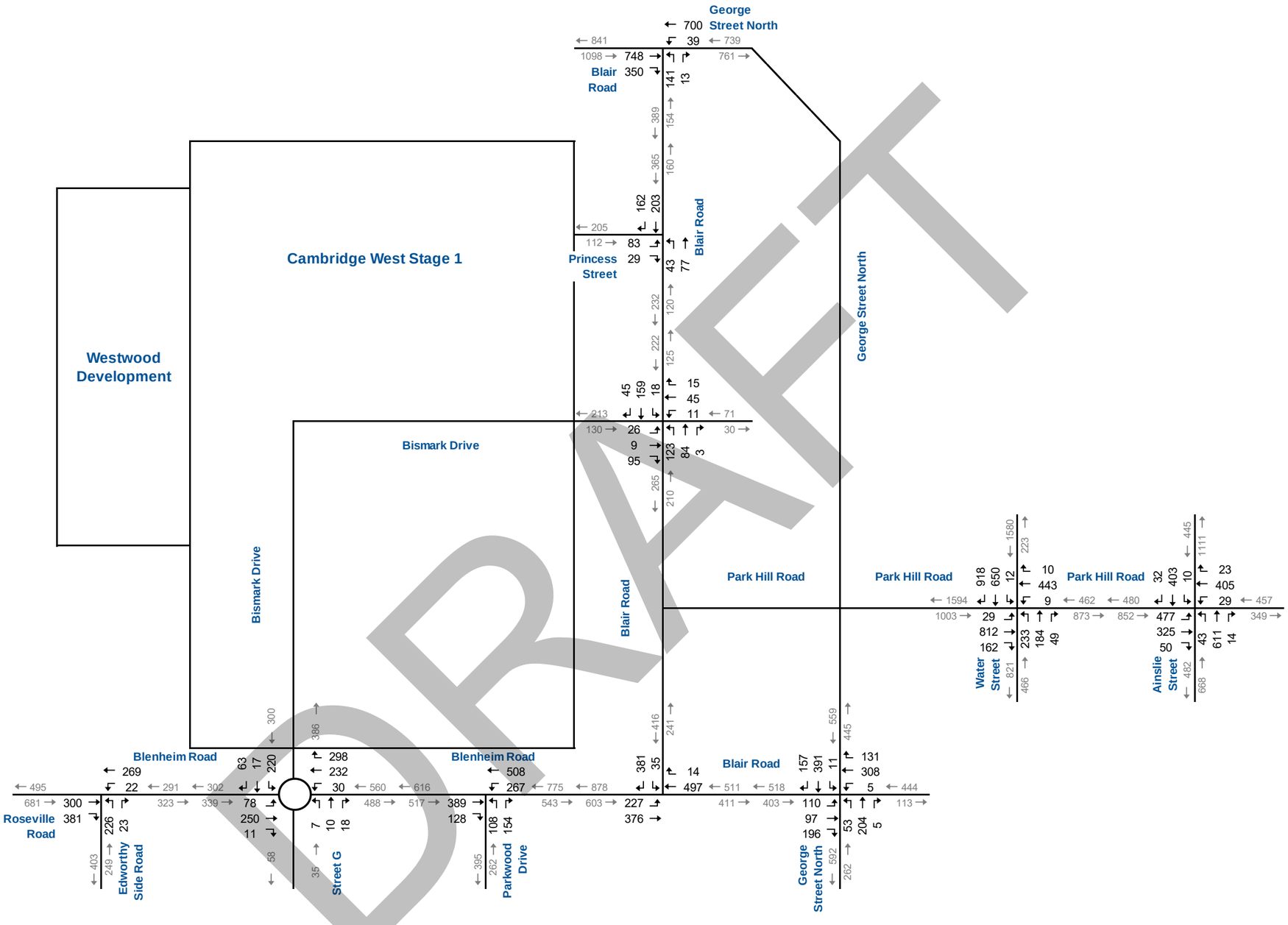


paradigm TRANSPORTATION SOLUTIONS LIMITED

2031 Background Traffic Volumes – AM Peak

Westwood Village Phase 2
180312

Figure 4.2

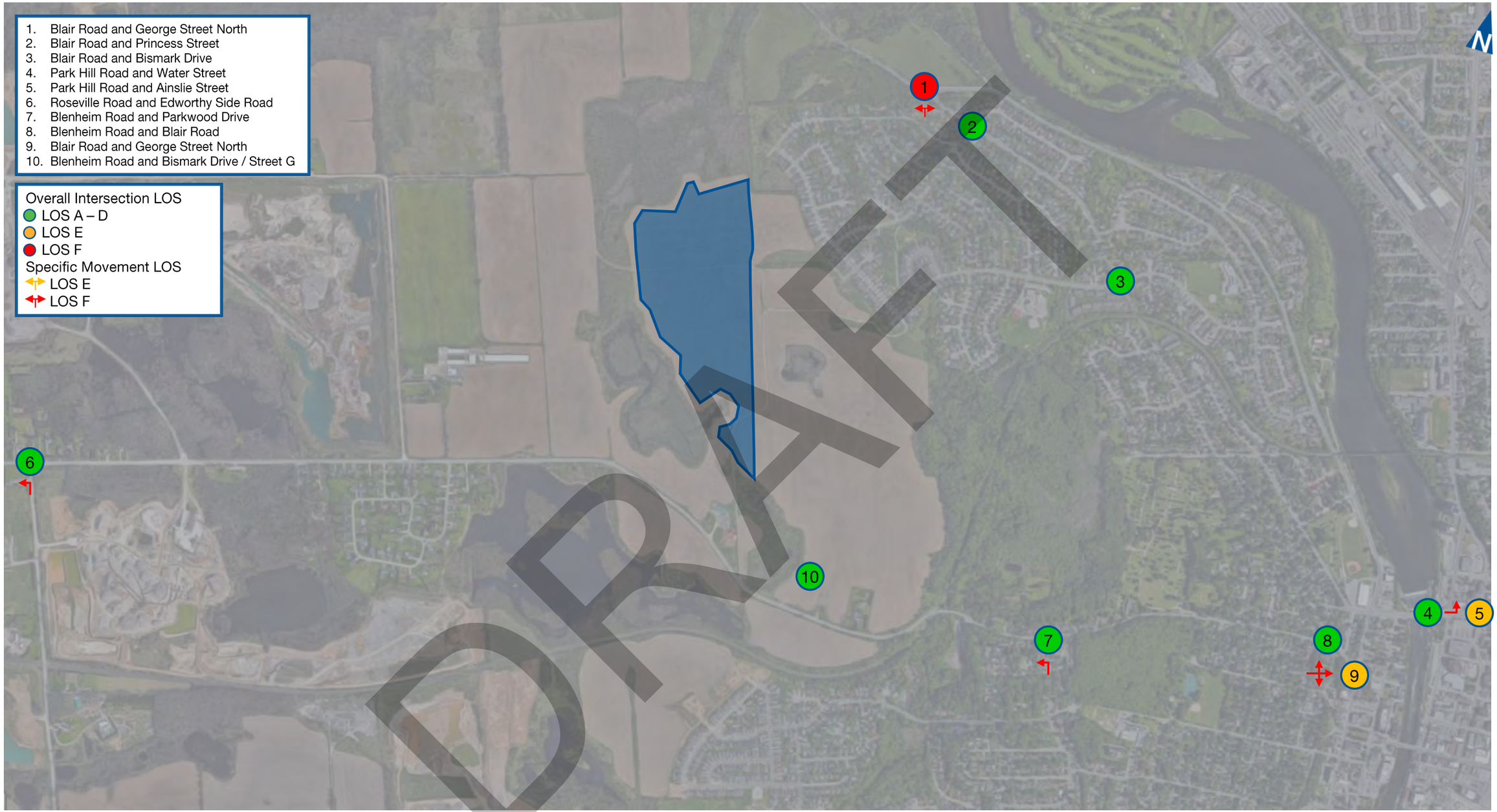


paradigm TRANSPORTATION SOLUTIONS LIMITED

2031 Background Traffic Volumes – PM Peak

Westwood Village Phase 2
180312

Figure 4.3



paradigm TRANSPORTATION SOLUTIONS LIMITED

2031 Background Traffic Operations – AM Peak

Westwood Village Phase 2
180312

Figure 4.4

1. Blair Road and George Street North
2. Blair Road and Princess Street
3. Blair Road and Bismark Drive
4. Park Hill Road and Water Street
5. Park Hill Road and Ainslie Street
6. Roseville Road and Edworthy Side Road
7. Blenheim Road and Parkwood Drive
8. Blenheim Road and Blair Road
9. Blair Road and George Street North
10. Blenheim Road and Bismark Drive / Street G

Overall Intersection LOS
- LOS A – D
- LOS E
- LOS F

Specific Movement LOS
- LOS E
- LOS F

2031 Background Traffic Operations – PM Peak

Westwood Village Phase 2
180312

Figure 4.5

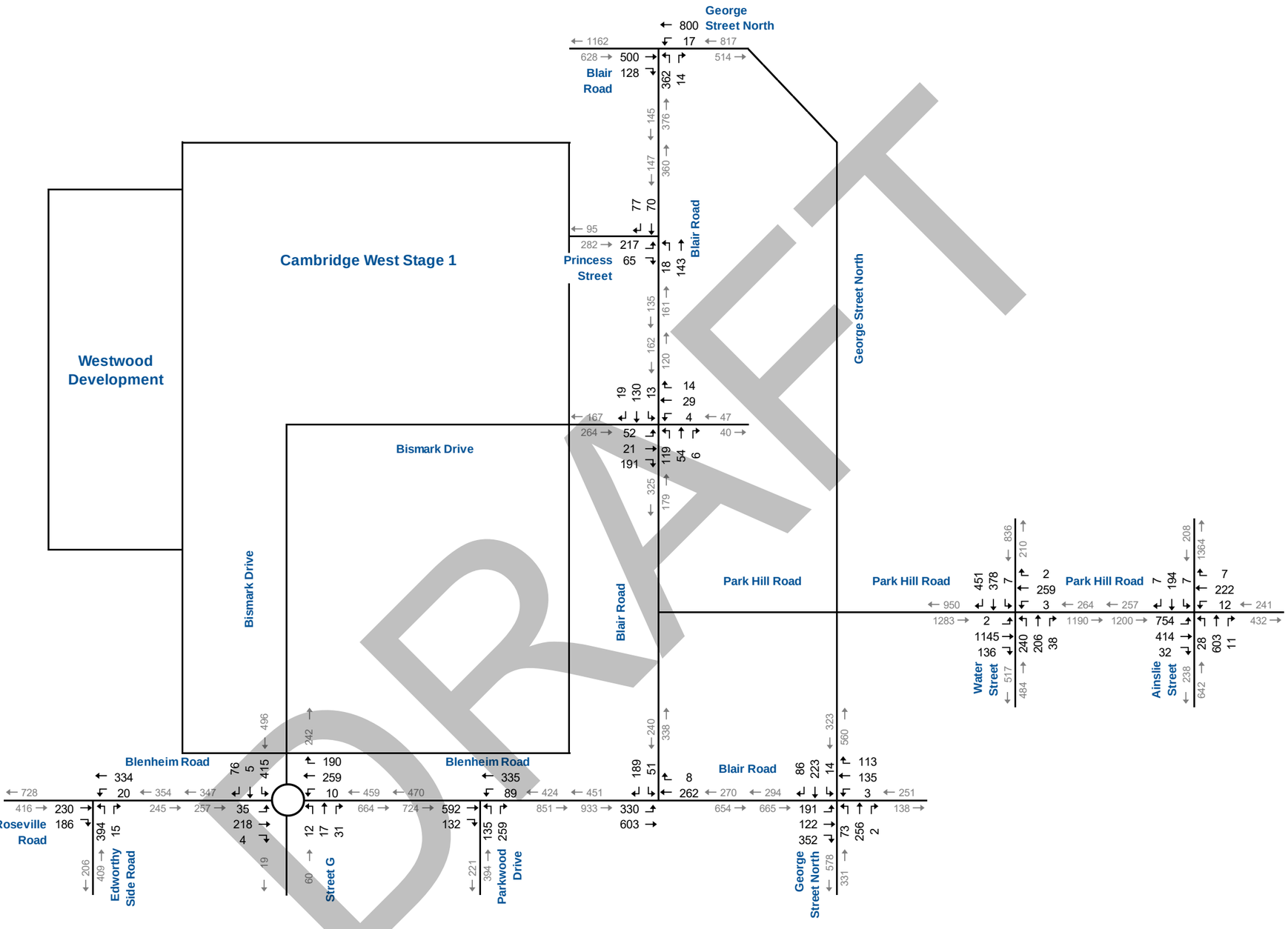
4.1.2 Total Traffic Operations

Figure 4.6 and **Figure 4.7** display the forecast 2031 total traffic volumes, including both background traffic and development traffic, for the AM and PM peaks, respectively.

Similar to background traffic conditions, Level of Service analysis was undertaken, and the results are summarized in **Figure 4.8** and **Figure 4.9**. As under background traffic conditions, most observed intersections have acceptable operational values except for the following intersections and critical movements:

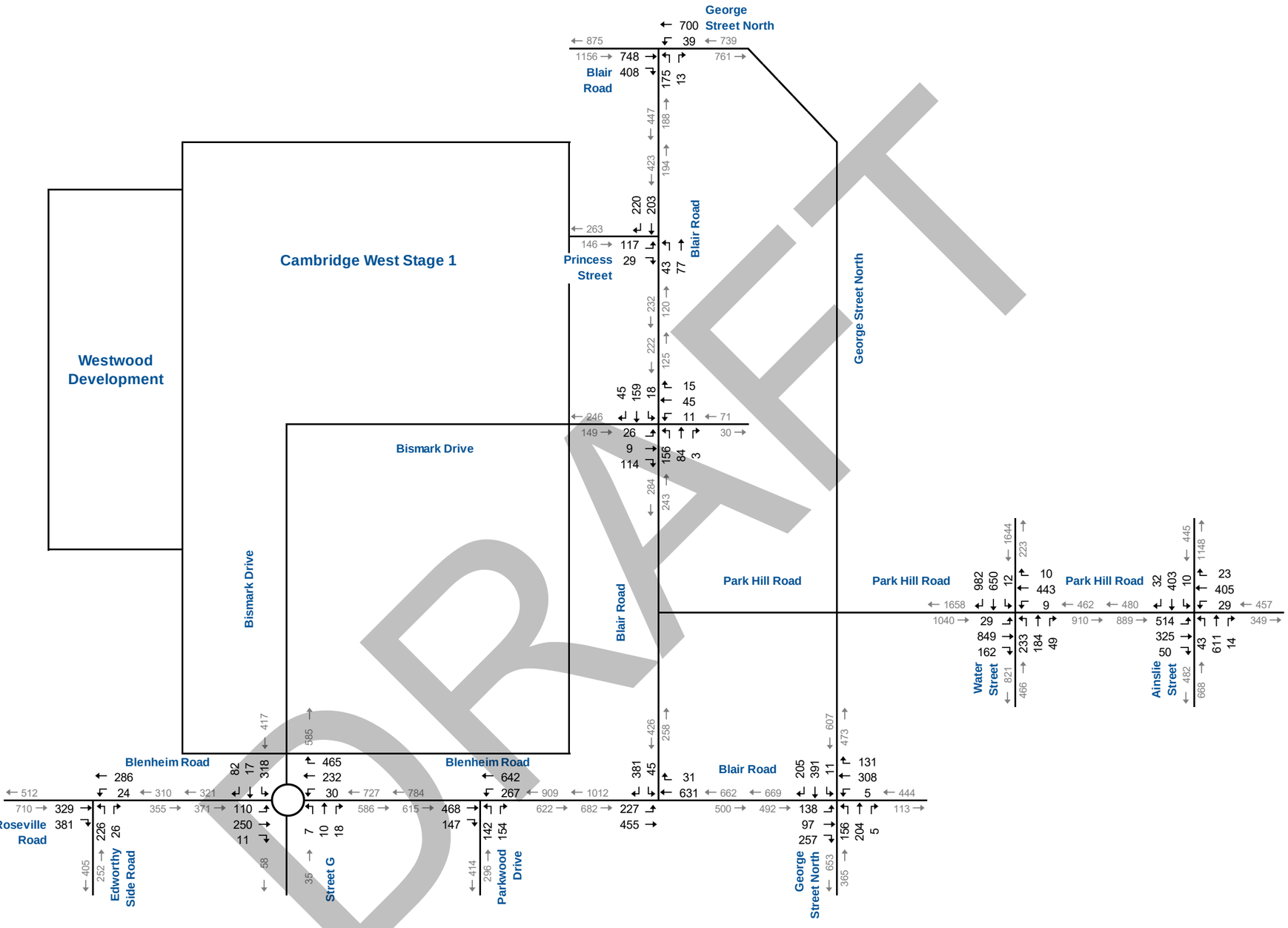
- **Blair Road and George Street North (North Intersection):** The northbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. Overall, the intersection is forecast to operate at a LOS F during the PM peak hour;
- **Water Street and Park Hill Road:** The northbound left-turn movement is forecast to operate at a LOS E during the PM peak hour;
- **Roseville Road and Edworthy Side Road:** The northbound shared movement is forecast to operate at a LOS F and a LOS E during the AM and PM peak hour, respectively;
- **Blenheim Road and Parkwood Drive:** The northbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. Overall, the intersection is forecast to operate at a LOS E and LOS F during the AM and PM peak hour, respectively;
- **Blenheim Road and Blair Road:** The southbound shared movement is forecast to operate at a LOS F during both peak hours and with a v/c greater 1.0 during the PM peak hour; and
- **Blair Road and George Street North (South Intersection):** The eastbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. The westbound, northbound and southbound shared movements are forecast to operate at a LOS F with a v/c greater than 1.0 during the PM peak hour. Overall, the intersection is forecast to operate at a LOS F during both peak hours.

Appendix D includes the detailed Synchro 10 reports.



2031 Total Traffic Volumes – AM Peak

Figure 4.6



paradigm TRANSPORTATION SOLUTIONS LIMITED

2031 Total Traffic Volumes – PM Peak

Westwood Village Phase 2
180312

Figure 4.7

1. Blair Road and George Street North
2. Blair Road and Princess Street
3. Blair Road and Bismark Drive
4. Park Hill Road and Water Street
5. Park Hill Road and Ainslie Street
6. Roseville Road and Edworthy Side Road
7. Blenheim Road and Parkwood Drive
8. Blenheim Road and Blair Road
9. Blair Road and George Street North
10. Blenheim Road and Bismark Drive / Street G

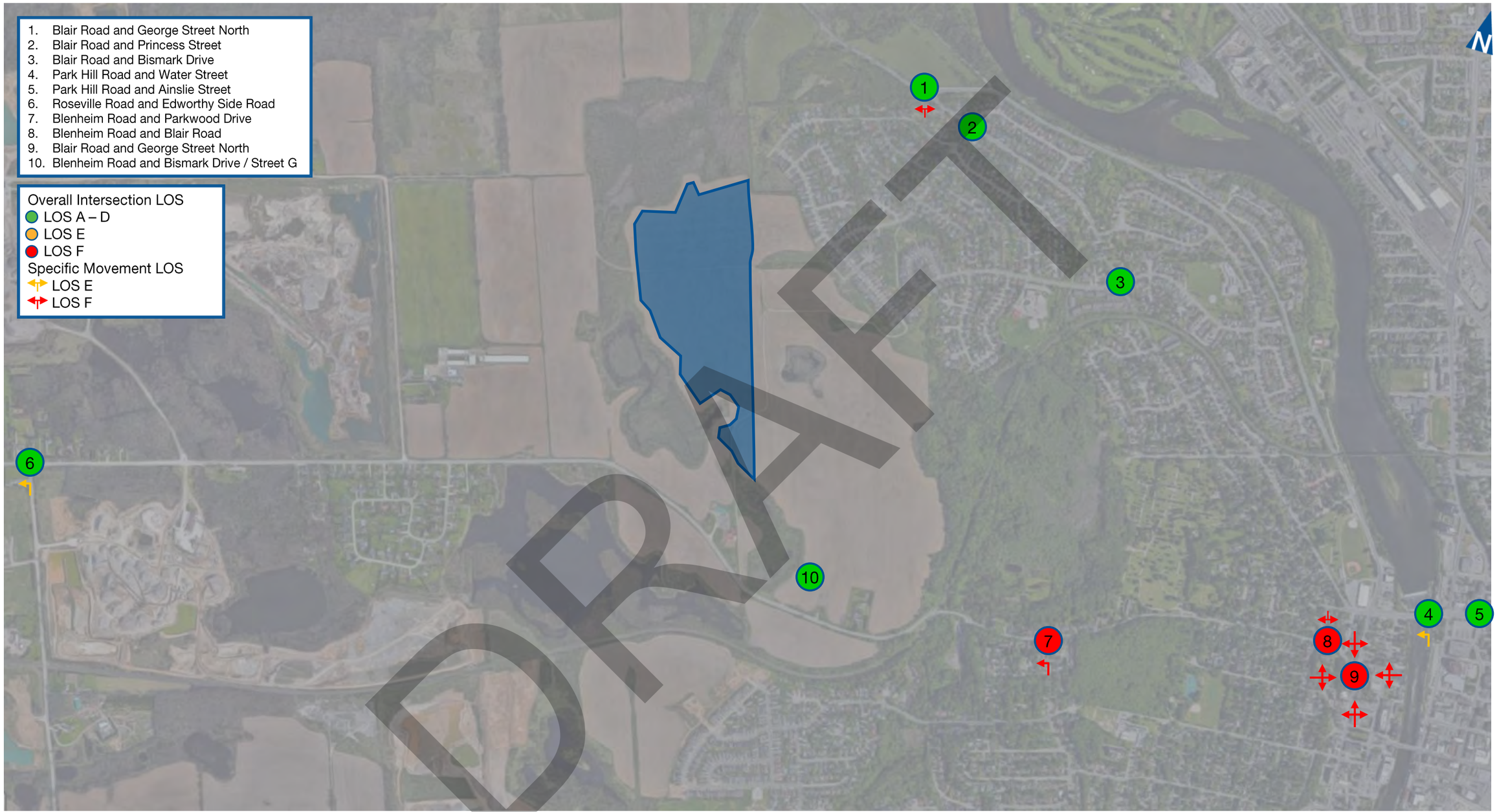
Overall Intersection LOS
- LOS A – D
- LOS E
- LOS F

Specific Movement LOS
- LOS E
- LOS F

2031 Total Traffic Operations – AM Peak

Figure 4.8

Westwood Village Phase 2
180312



paradigm TRANSPORTATION SOLUTIONS LIMITED

2031 Total Traffic Operations – PM Peak

Westwood Village Phase 2
180312

Figure 4.9

4.1.3 Phase 1 and Phase 2 Traffic Operations Comparison

As noted above, this TIS follows the assumptions made in the Phase 1 TIS, so a comparison of the traffic operations was completed to determine the increase is operational deficiencies. It was found that the following intersections experienced a decrease in operations:

- **Blenheim Road and Blair Road:** The southbound shared left-right movement is forecast to decrease from a LOS D to F during the AM peak hour. The overall intersection operation is forecast to decrease from a LOS C to F during the PM peak hour; and
- **George Street North and Blair Road/Blair Road:** The northbound shared movement is forecast to decrease from a LOS D to F during the PM peak hour.

Table 4.1 summarizes the comparison between the traffic operations under the 2031 background (Phase 1) and total (Phase 2) horizons.

TABLE 4.1: PHASE 1 AND 2 TRAFFIC OPERATIONS COMPARISON

Analysis Period	Intersection	Control Type	Movement	Scenario Level of Service	
				Background - Including Westwood Village (Phase 1) Community	Total - Westwood Village (Phase 2) Community
AM Peak Hour	1: Blair Road and Geroge Street North	TWSC	NBL/NBR	F	F
	6: Edworthy Side Road and Roseville Road/Blenheim Road	TWSC	NBL/NBR	F	F
	7: Parkwood Drive and Blenheim Road	TWSC	NBL/NBR	F	F
	8: Blenheim Road and Blair Road	TWSC	SBL/SBR	D	F
	9: George Street North and Blair Road/Blair Road	TWSC	EBA	F	F
PM Peak Hour	1: Blair Road and Geroge Street North	TWSC	NBL/NBR	F	F
	4: Water Street & Park Hill Road	TCS	NBL	E	E
	6: Edworthy Side Road and Roseville Road/Blenheim Road	TWSC	NBL/NBR	E	E
	7: Parkwood Drive and Blenheim Road	TWSC	NBL/NBR	F	F
	8: Blenheim Road and Blair Road	TWSC	SBL/SBR	F	F
	9: George Street North and Blair Road/Blair Road	TWSC	EBA	F	F
			WBA	F	F
			NBA	D	F
			SBA	F	F

LOS - Level of Service
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

Note: Highlighted values decrease from a LOS A - D to a LOS E or F under the 2031 total horizon.

5 Remedial Measures

5.1 Signal Justification

Signal justification warrants, using the OTM Book 12 Justification 7[5], were analyzed for the following intersections under the 2031 traffic conditions:

- **Blair Road and George Street North (North Intersection):** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 55.3% and 116.0% out of the 120% requirement, respectively. The Region of Waterloo plans to review the need for enhanced traffic control at this intersection in 2019 and every five years thereafter;
- **Roseville Road and Edworthy Side Road:** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 91.8% and 93.2% out of the 120% requirement, respectively;
- **Blenheim Road and Parkwood Drive:** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 67.6% and 92.3% out of the 120% requirement, respectively;
- **Blenheim Road and Blair Road:** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 65.3% and 32.0% out of the 120% requirement, respectively;
- **Blair Road and George Street North (South Intersection):** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 120.8% and 56.5% out of the 120% requirement, respectively.

  By 2031, the warrant calculations are forecast to reach the threshold to justify a signal. However, as the warrant is just barely met, and the assumed background growth, trip generation and assignment could potentially change by the 2031 horizon, it is not recommended that a signal be implemented currently. Rather, this intersection should be monitored and reviewed regularly by the Region of Waterloo.

Appendix E contains the OTM Book 12 Signal Justification Warrant worksheets.

[5] Book 12: Traffic Signals, *Ministry of Transportation of Ontario*, March 2012

5.2 Left-Turn Lanes

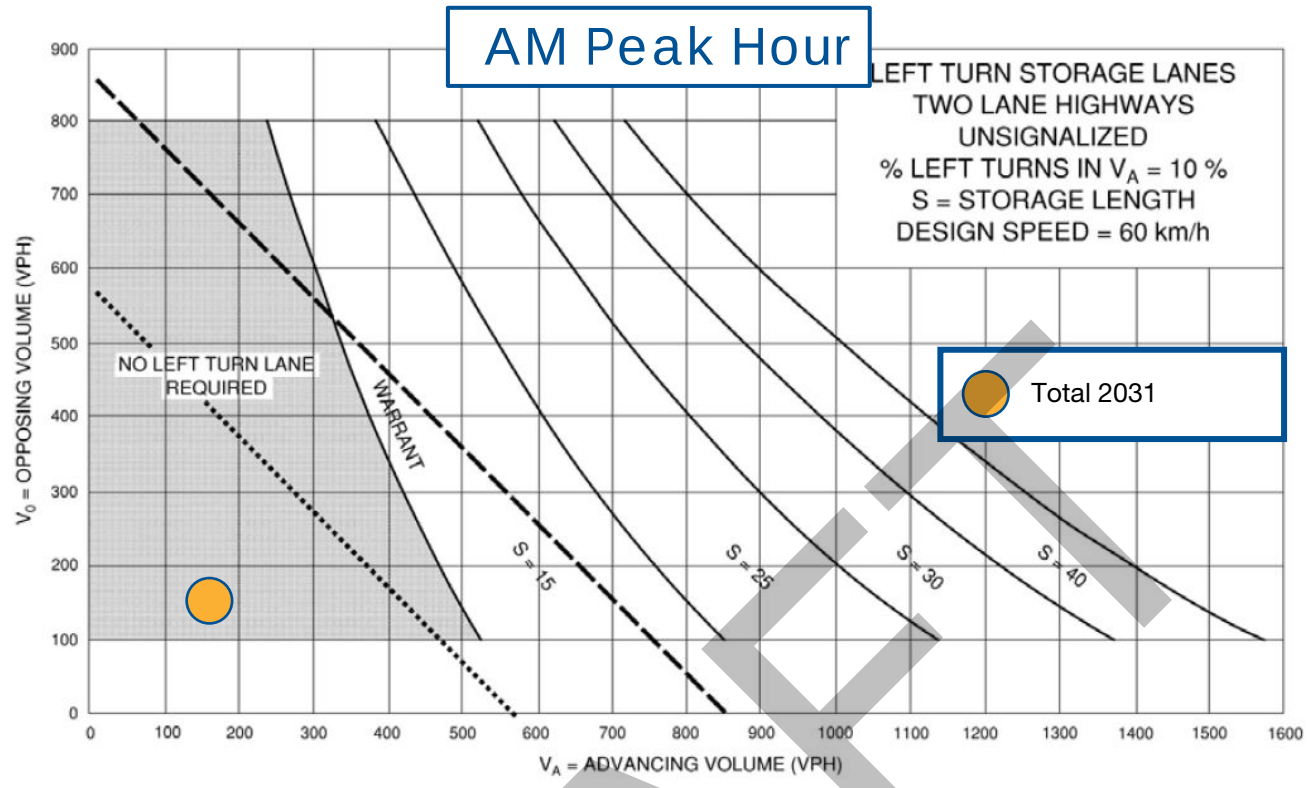
The need for designated left-turning lanes at unsignalized intersections within the study area was assessed using the procedures detailed the MTO Supplement to the Geometric Design Guide for Canadian Roads[6]. Standard practice in the Region of Waterloo considers a design speed of 10 km/h higher than the posted limited, considering the urban characteristics of the immediate area and the restricted flow of traffic.

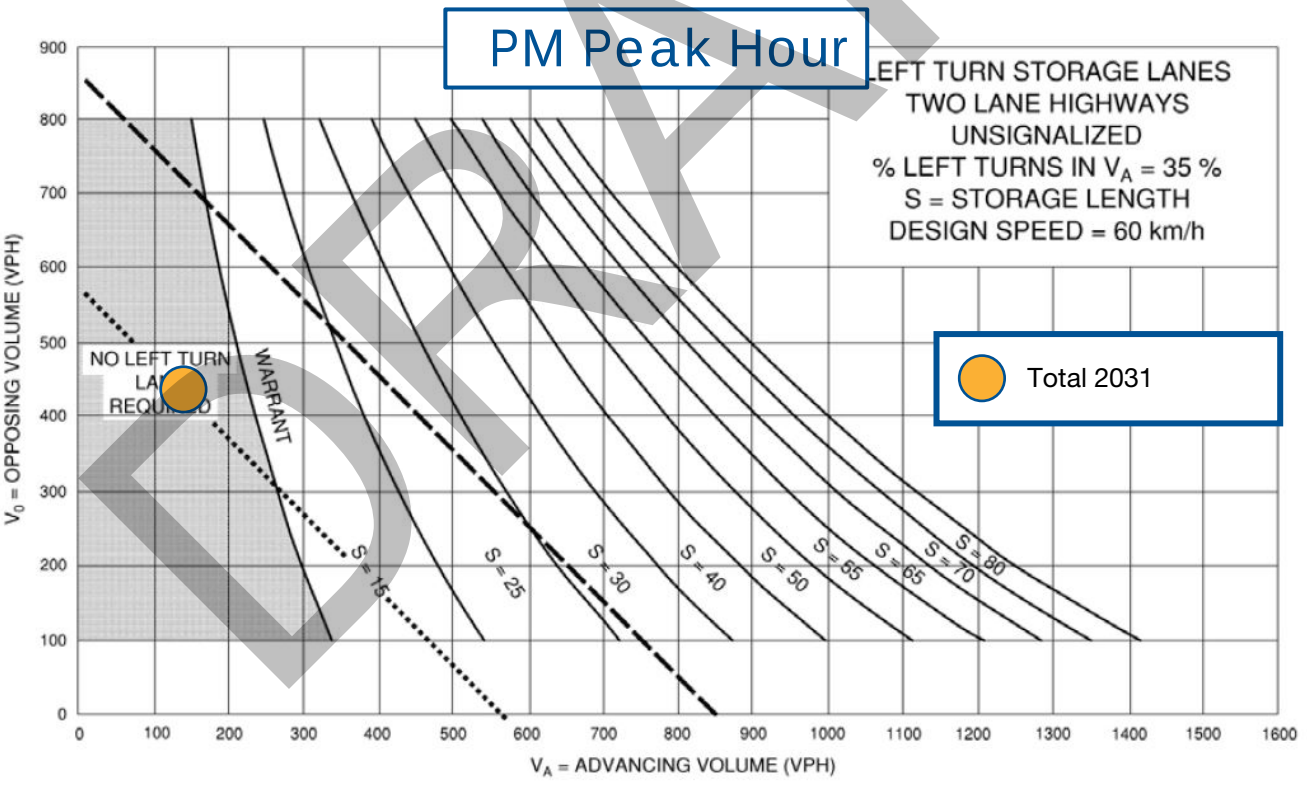
Left-turn lane warrants were assessed for the following intersections under the 2031 total and background traffic conditions:

- **Blair Road and Princess Street:** a northbound left-turn lane is not forecast to be warranted;
- **Blair Road and Bismark Drive:** a northbound left-turn lane is not forecast to be warranted;
- **Roseville Road and Edworthy Side Road:** a westbound left-turn lane with 15 metres of storage length is forecast to be warranted under both the 2031 background and 2031 total conditions, regardless of whether the subject development is built;
- **Blenheim Road and Parkwood Drive:** a westbound left-turn lane with 65 of storage length is forecast to be warranted under the 2031 background conditions, regardless of whether the subject development is built. An additional 10 metres of storage length is forecast to be warranted under 2031 total conditions; and
- **Blenheim Road and Blair Road:** an eastbound left-turn lane with 50 of storage length is forecast to be warranted under the 2031 background conditions, regardless of whether the subject development is built. An additional 15 metres of storage length is forecast to be warranted under the 2031 total condition.

Figure 5.1 – Figure 5.7 displays the left-turn lane warrant nomographs for the intersections.

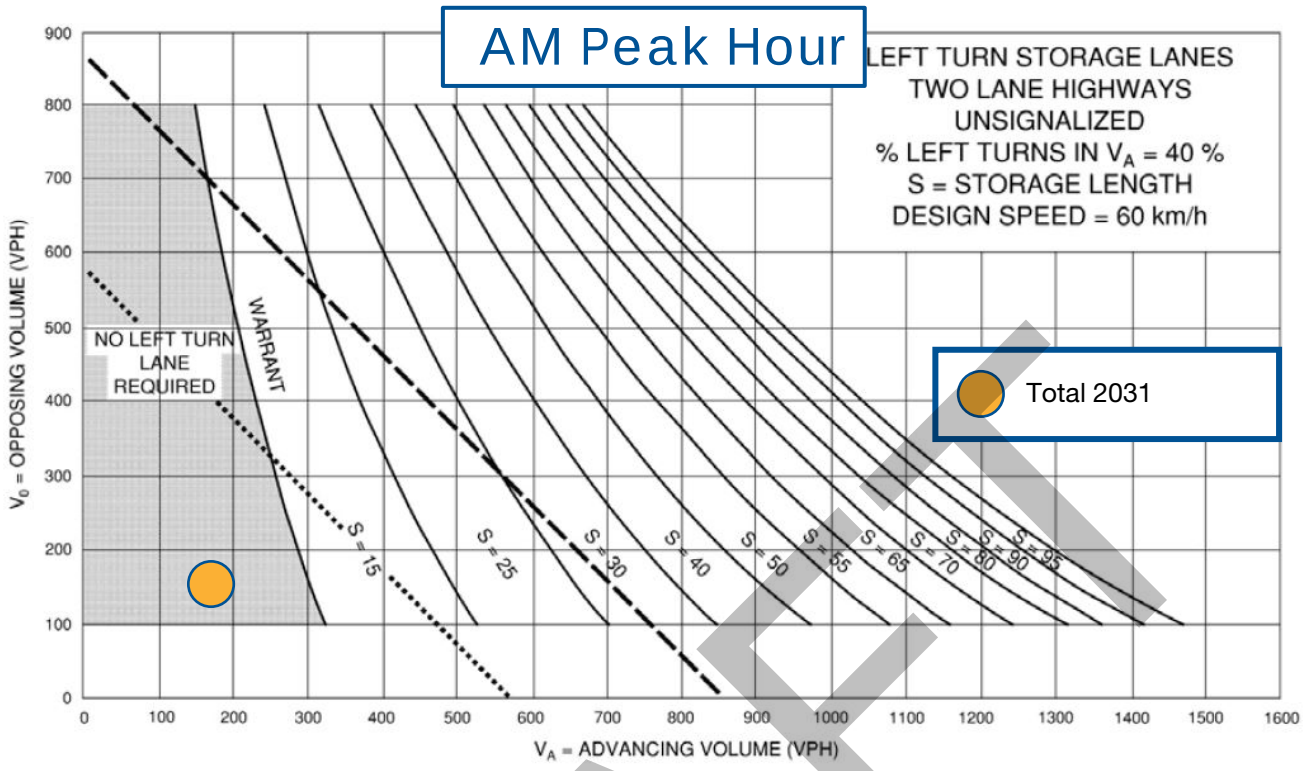
[6] Geometric Design Guide for Canadian Road, *Transportation Association of Canada,* 2016.

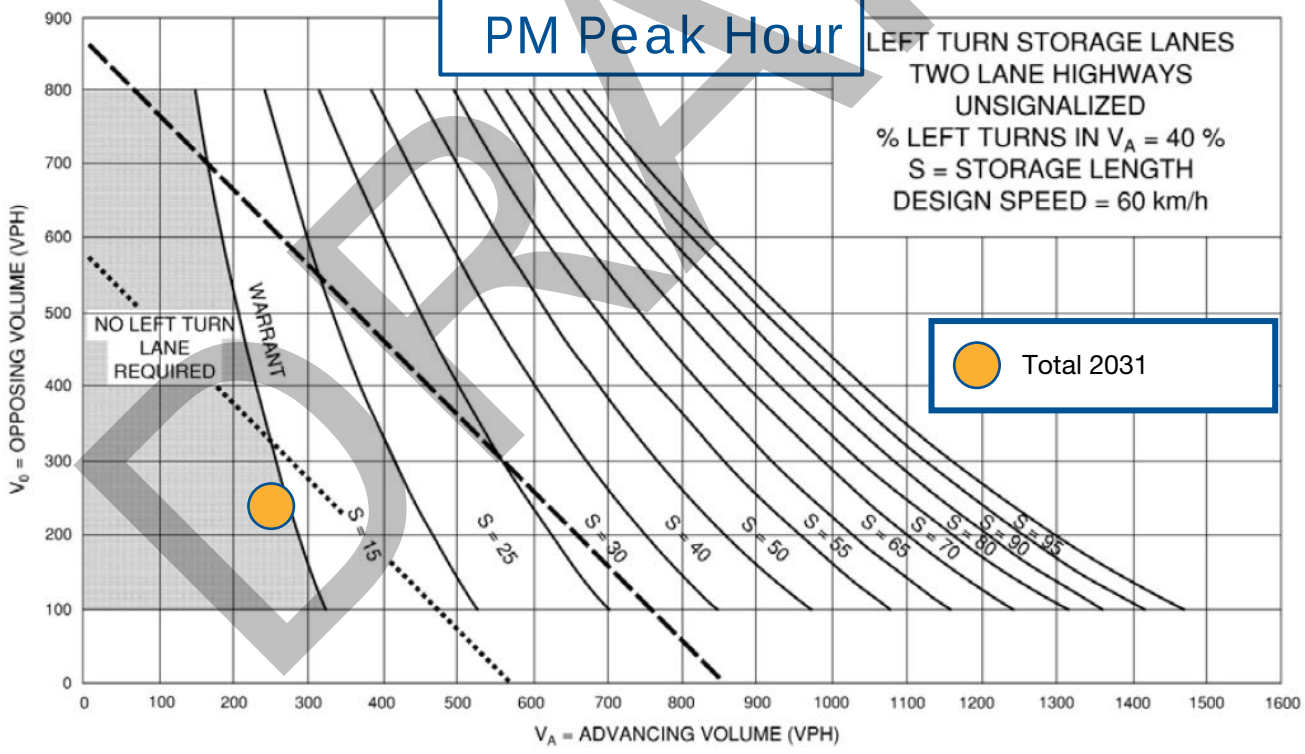




paradigm TRANSPORTATION SOLUTIONS LIMITED

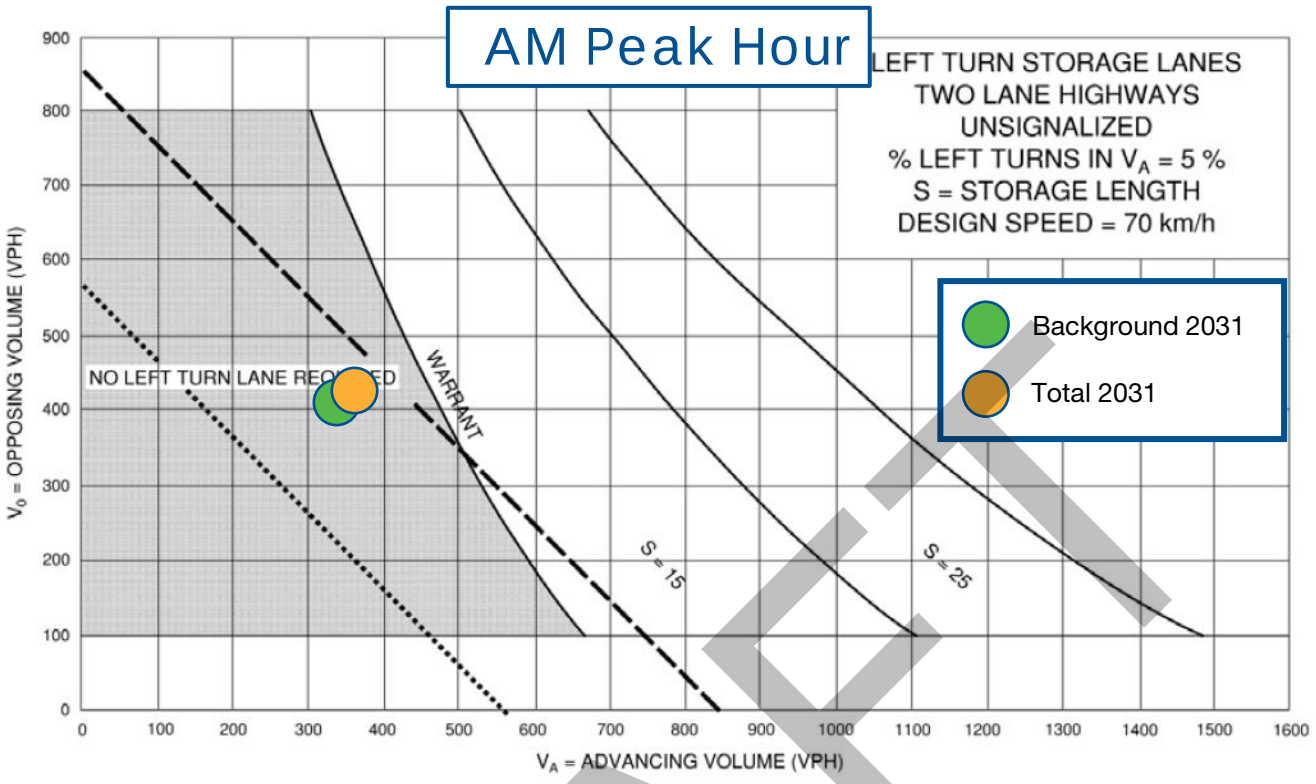
Northbound Left-Turn Lane Warrants, Blair Road and Princess Street

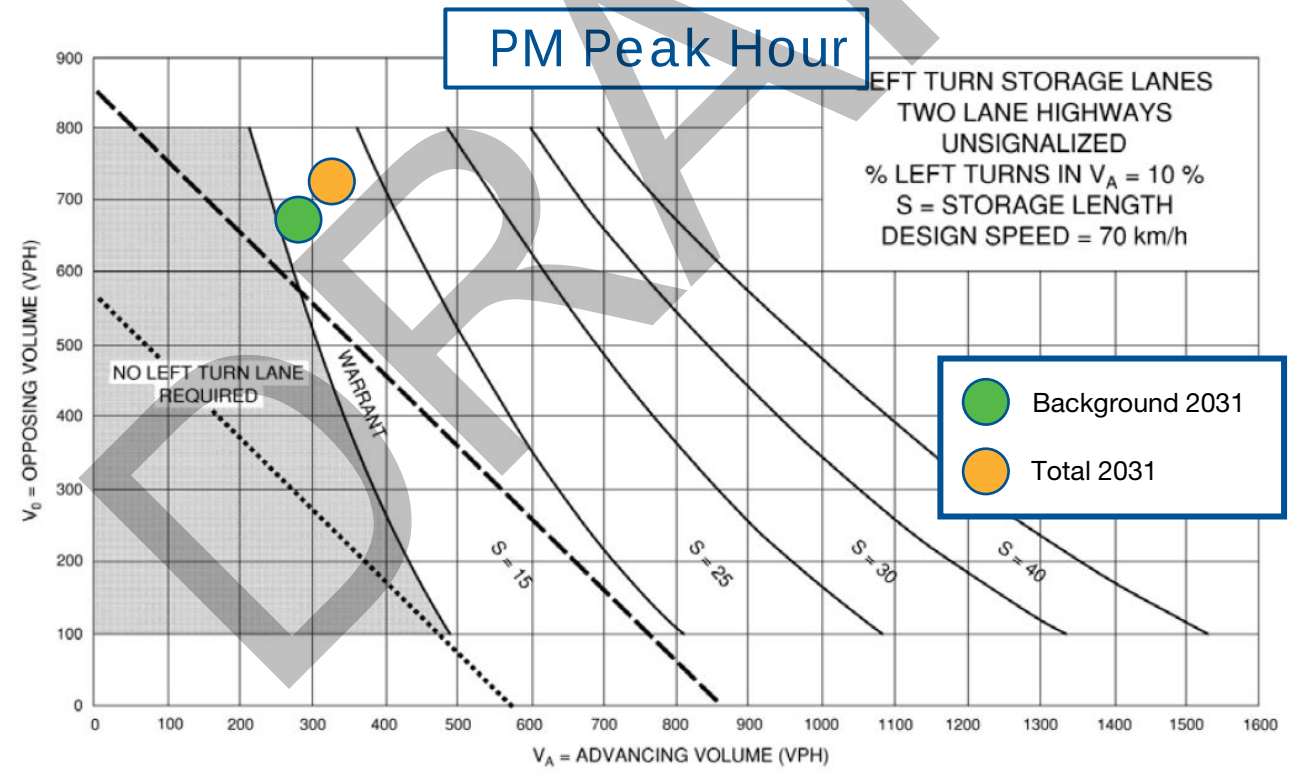




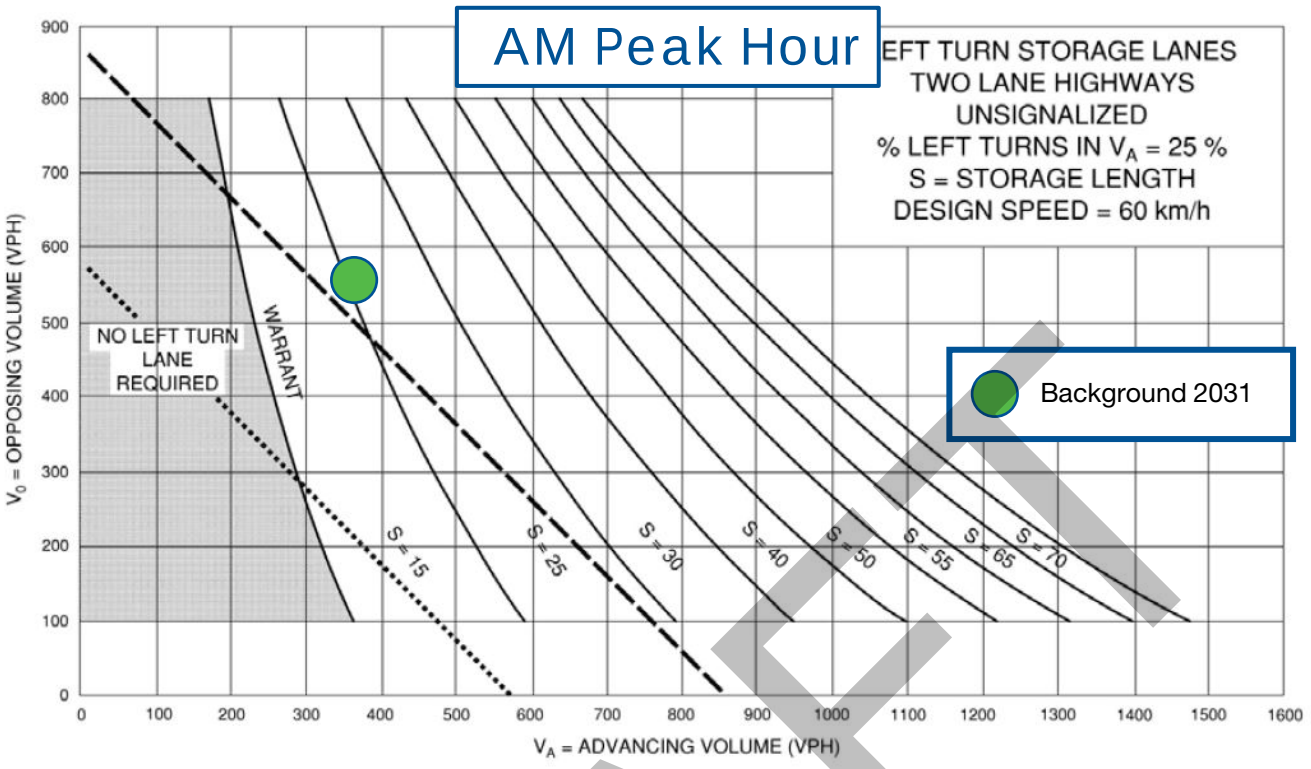
paradigm TRANSPORTATION SOLUTIONS LIMITED

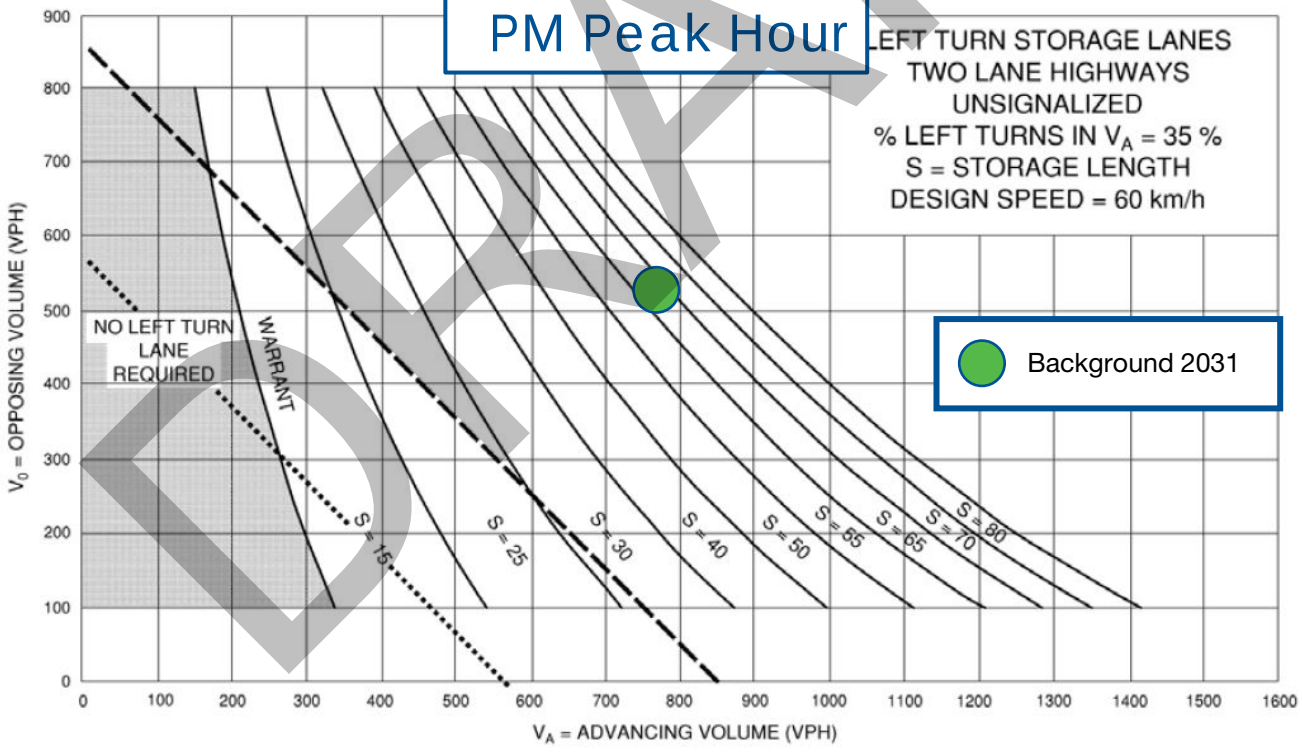
Northbound Left-Turn Lane Warrants, Blair Road and Bismark Drive





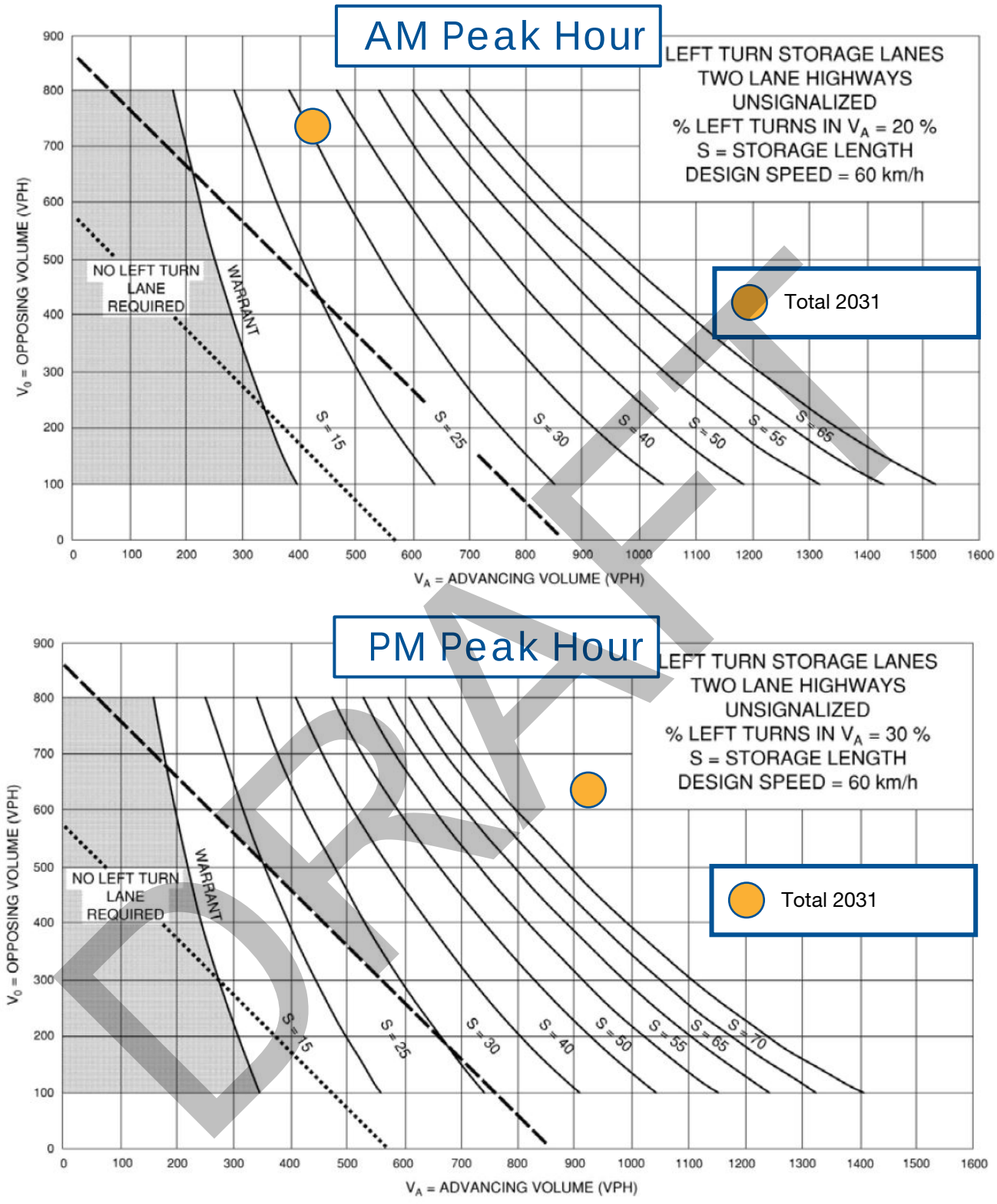
Westbound Left-Turn Lane Warrants, Roseville Road and Edworthy Side Road



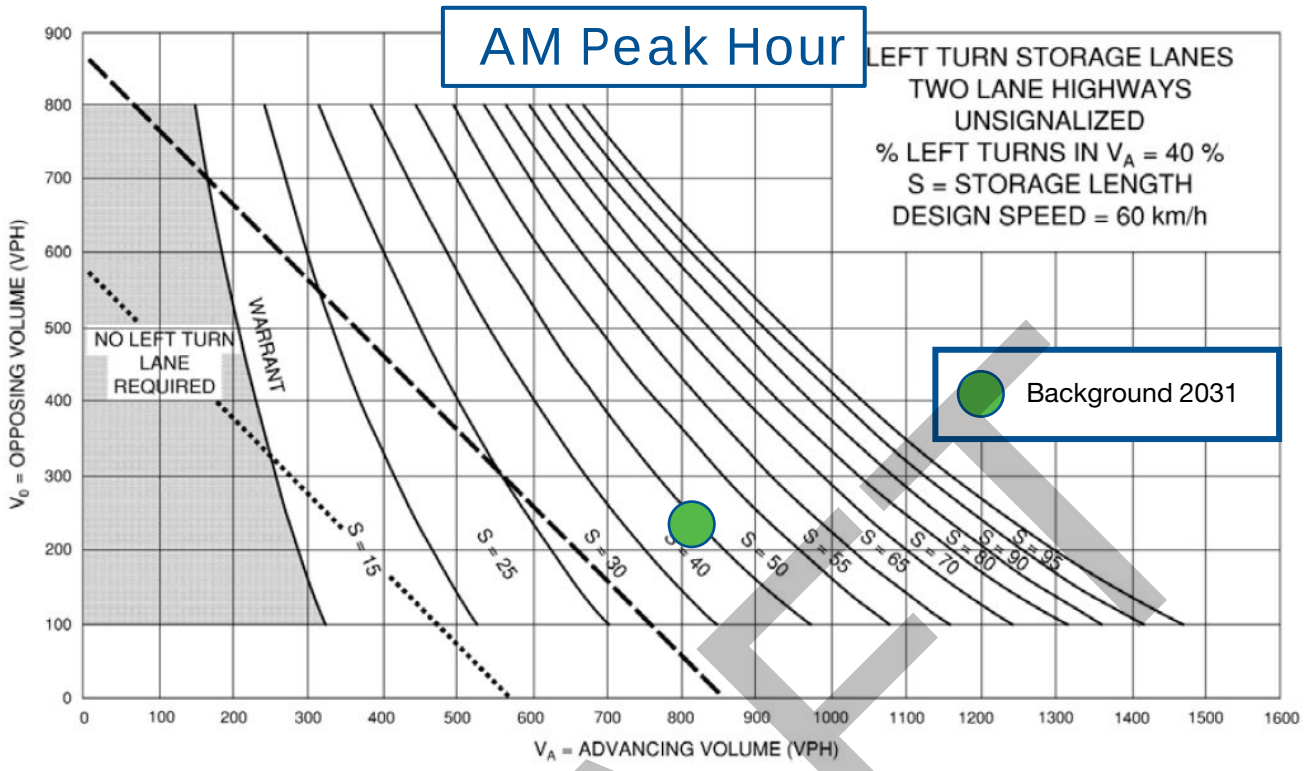


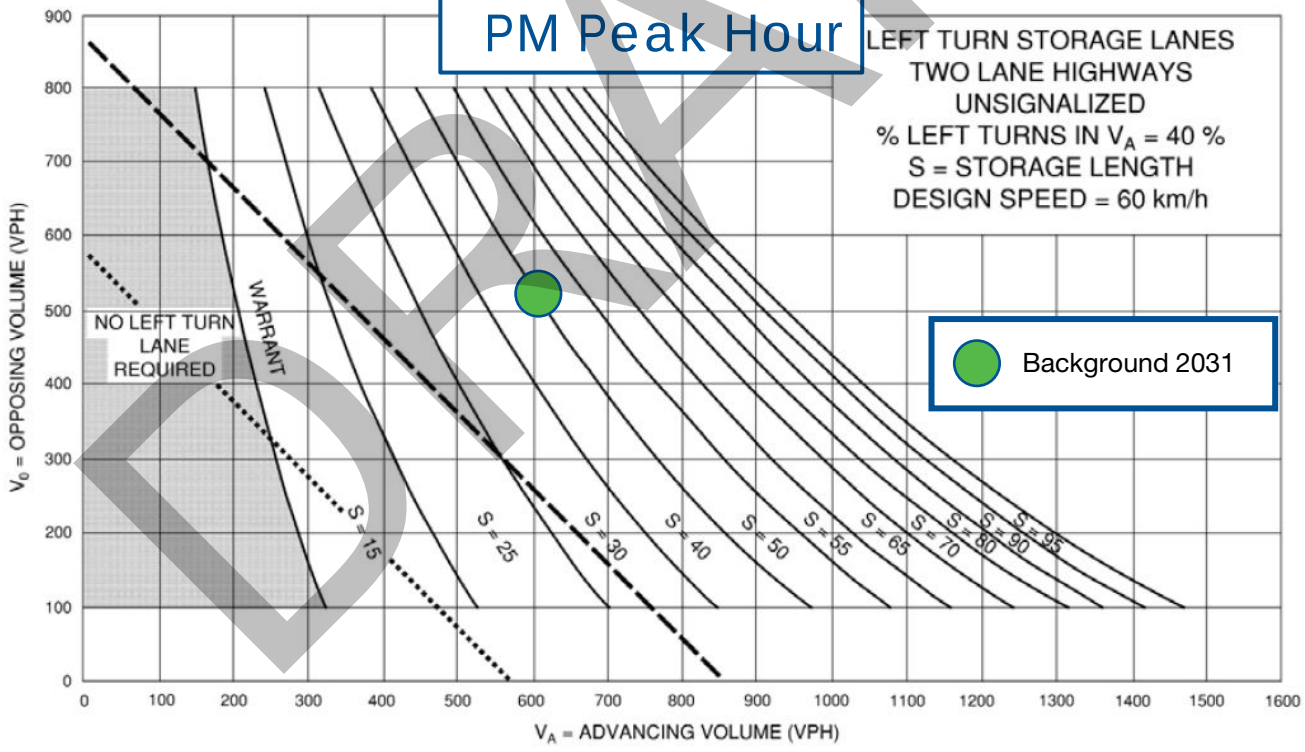
paradigm TRANSPORTATION SOLUTIONS LIMITED

Northbound Left-Turn Lane Warrants, Blenheim Road and Parkwood Drive – Background 2031



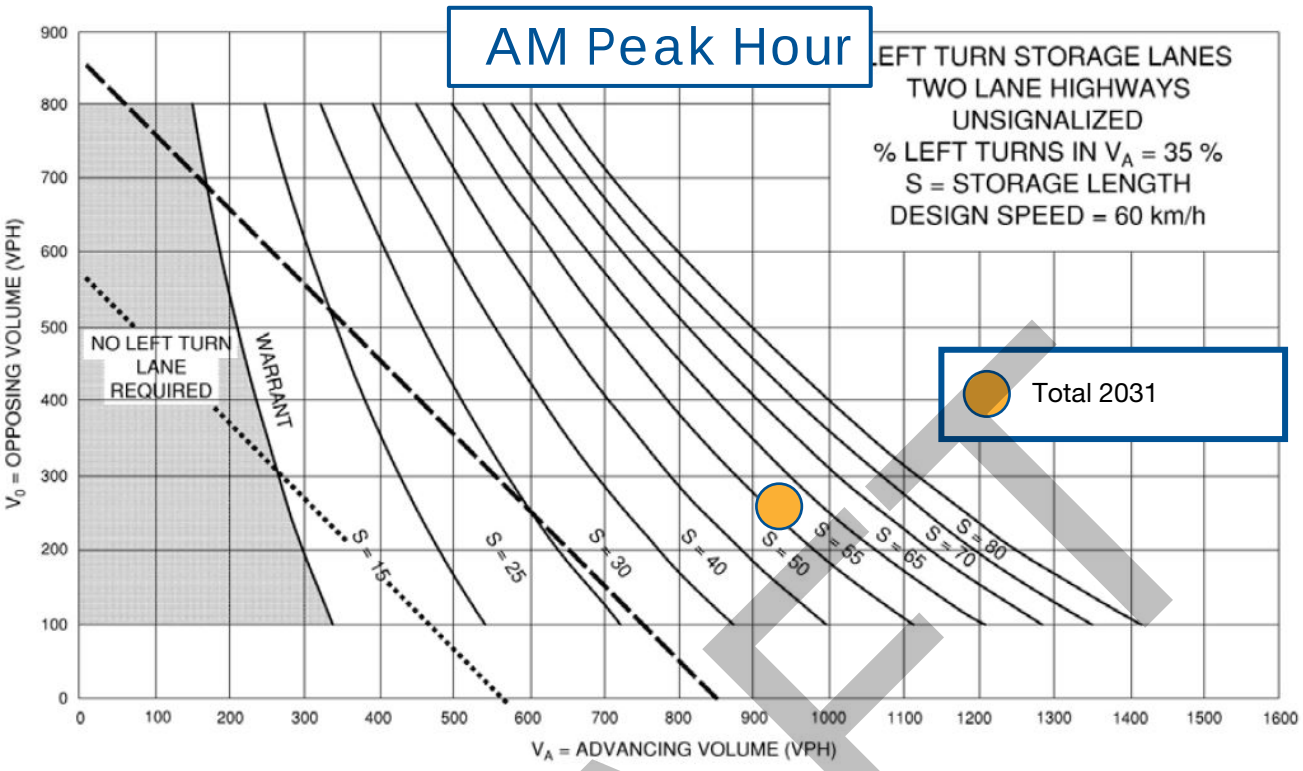
Northbound Left-Turn Lane Warrants, Blenheim Road and Parkwood Drive – Total 2031

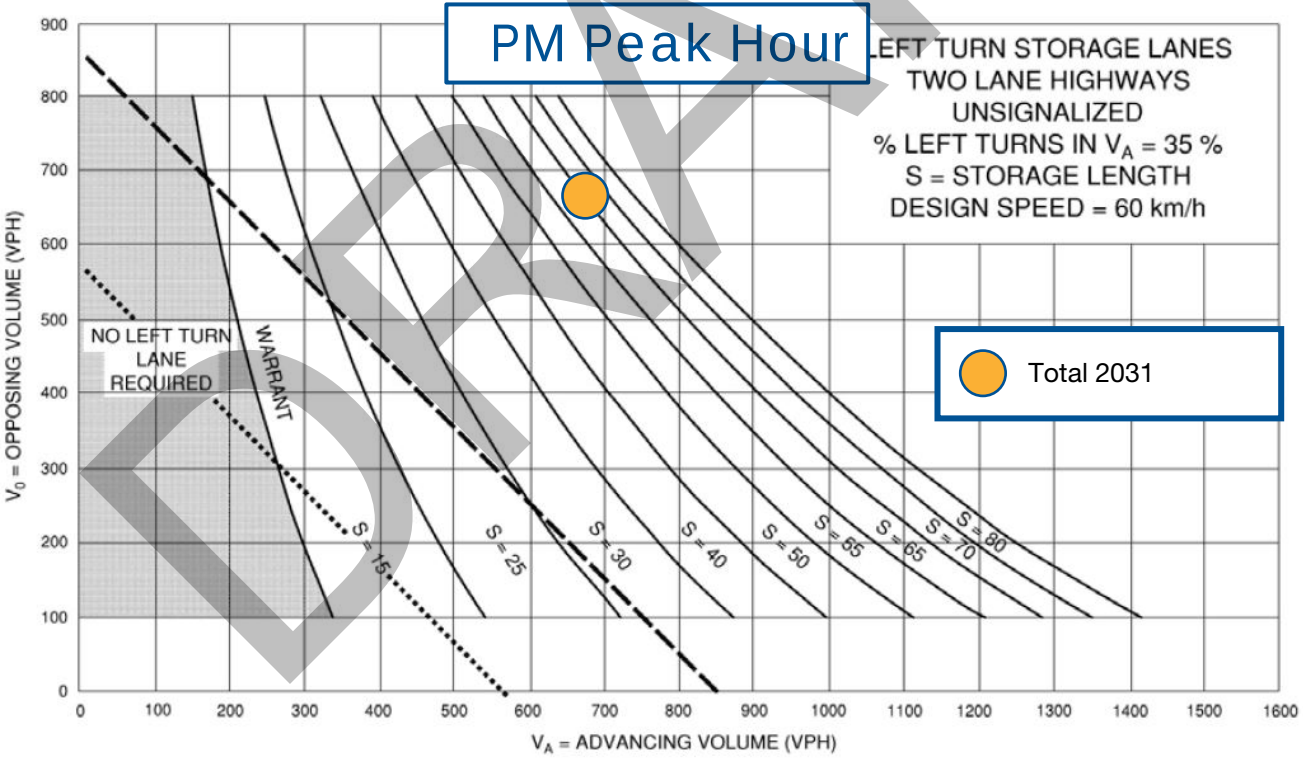




paradigm TRANSPORTATION SOLUTIONS LIMITED

Northbound Left-Turn Lane Warrants, Blenheim Road and Blair Road – Background 2031





paradigm TRANSPORTATION SOLUTIONS LIMITED

Northbound Left-Turn Lane Warrants, Blenheim Road and Blair Road – Total 2031

5.3 Additional Intersection Improvements

Due to the increase in traffic caused by both the background growth and the proposed development, the following intersections are forecast to have movements with poor operations under the 2031 background and total traffic conditions:

- Blair Road and George Street North (North Intersection);
- Roseville Road and Edworthy Side Road;
- Blenheim Road and Parkwood Drive;
- Blenheim Road and Blair Road.

To remedy this, additional turn lanes or signal timing improvements may be added to provide additional capacity, discussed in more detail below.

5.3.1 Blair Road and George Street North (North Intersection)

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

5.3.2 Roseville Road and Edworthy Side Road

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

5.3.3 Blenheim Road and Parkwood Drive

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

5.3.4 Blenheim Road and Blair Road

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

6 Conclusions and Recommendations

6.1 Conclusions

- Westwood Village Phase 2 is forecast to generate 361 and 462 trips during the AM and PM peak hour, respectively;
- **Table 6.1** summarizes the movements where levels of service and/or capacity thresholds could be exceeded that warrant mitigation or improvements;
- Left-turn Lanes are warranted at the intersections of:
  - **Roseville Road and Edworthy Sideroad (westbound):** 15 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development.
  - **Blenheim Road and Parkwood Drive (westbound):** 65 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 10 metres of storage length is warranted by the 2031 total traffic conditions.
  - **Blenheim Road and Blair Road (eastbound):** 50 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 20 metres of storage length is warranted by the 2031 total traffic conditions.

TABLE 6.1: SUMMARY OF MOVEMENTS OF INTEREST AND WARRANTED IMPROVEMENTS

Intersection	No.	Issue / Remediation Type	Scenairo	
			Background - including Westwood Village (Phase 1) Community	Total - Westwood Village (Phase 2) Community
Blair Road and George Street North (North)	1	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Park Hill Road and Water Street	4	Identified Movement of Interest[1]	EBLT, NBLT and SBRT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Park Hill Road and Ainslie Street	5	Identified Movement of Interest[1]	EBLT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Roseville Road and Edworthy Side Road	6	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	15 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Parkwood Drive	7	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	75 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Blair Road	8	Identified Movement of Interest[1]	SBLT	SBLT
		Warranted Improvements	None	65 meter eastbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blair Road and George Street North (South)	9	Identified Movement of Interest[1]	EBA, WBA, NBA and SBA	EBA, WBA, NBA and SBA
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control

1 - Movements identified as operating at LOS E or F

6.2 Recommendations

This study has identified the following improvements to the transportation network to address deficiencies caused by the development of the Westwood Village Phase 2 lands:

- **Blair Road and George Street North (North Intersection):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals;
- **Roseville Road and Edworthy Side Road:** It is recommended that an auxiliary westbound left-turn lane with a 15 metre storage length be constructed, regardless of whether the subject development is built;
- **Blenheim Road and Parkwood Drive:** It is recommended that an auxiliary westbound left-turn lane with a 75 metre storage length be constructed. 65 metres of the storage length is warranted regardless of whether the subject development is built;
- **Blenheim Road and Blair Road:** It is recommended that an auxiliary eastbound left-turn lane with a 70 metre storage length be constructed. 50 metres of the storage length is warranted regardless of whether the subject development is built; and
- **Blair Road and George Street North (9):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals.

Appendix A

Pre-Study Conference Form

Appendix B

Existing Traffic Operations

Appendix C

2031 Background Traffic Operations

Appendix D

2031 Total Traffic Operations

Appendix E

Signal Justification Warrants

Appendix D

STAMSON Output Files

STAMSON 5.0 NORMAL REPORT Date: 23-04-2021 10:52:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 5550inno.te Time Period: Day/Night 16/8 hours
Description: 55/50dBA INDOOR - NORTH OF STREET A

Road data, segment # 1: (day/night)

Car traffic volume : 3277/364 veh/TimePeriod *
Medium truck volume : 33/4 veh/TimePeriod *
Heavy truck volume : 33/4 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 3715
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 24.00 / 19.62 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: (day)

Source height = 1.00 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.59	59.56	0.00	-3.24	-1.33	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: (night)

Source height = 1.02 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	53.18	0.00	-1.85	-1.33	0.00	0.00	0.00	50.00

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 50.00

STAMSON 5.0 NORMAL REPORT Date: 23-04-2021 10:54:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 55outno.te Time Period: 16 hours
Description: 55dBA DAYTIME OUTDOOR - NORTH OF STREET A

Road data, segment # 1:

Car traffic volume : 3277 veh/TimePeriod *
Medium truck volume : 33 veh/TimePeriod *
Heavy truck volume : 33 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1:

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 23.08 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1:

Source height = 1.00 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	59.56	0.00	-3.11	-1.46	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

TOTAL Leq FROM ALL SOURCES: 55.00

STAMSON 5.0 NORMAL REPORT Date: 23-04-2021 10:40:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 5550inso.te Time Period: Day/Night 16/8 hours
Description: 55/50dBA INDOOR - SOUTH OF STREET A

Road data, segment # 1: (day/night)

Car traffic volume : 4728/525 veh/TimePeriod *
Medium truck volume : 48/5 veh/TimePeriod *
Heavy truck volume : 48/5 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 5360
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.27 / 23.85 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: (day)

Source height = 1.00 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.59	61.17	0.00	-4.83	-1.33	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: (night)

Source height = 0.98 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.59	54.53	0.00	-3.19	-1.33	0.00	0.00	0.00	50.00

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 50.00

STAMSON 5.0 NORMAL REPORT Date: 23-04-2021 10:41:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 55outso.te Time Period: 16 hours
Description: 55dBA DAYTIME OUTDOOR - SOUTH OF STREET A

Road data, segment # 1:

Car traffic volume : 4728 veh/TimePeriod *
Medium truck volume : 48 veh/TimePeriod *
Heavy truck volume : 48 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1:

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 28.82 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1:

Source height = 1.00 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	61.17	0.00	-4.71	-1.46	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

TOTAL Leq FROM ALL SOURCES: 55.00

P:\P\02534\800\02534-800-NA1

MTE FILE PATH:

LEGEND

- PROPERTY BOUNDARY
- MUNICIPAL BOUNDARY
- EXISTING WETLAND
- LIMIT OF WETLAND BUFFER
- FLOODLINE LIMIT
- CENTER LINE
- EXISTING CONTOURS
- SUBJECT LANDS (DRAFT PLAN LIMITS)
- EXISTING EMBANKMENT
- EXISTING DRIPLINE
- PROPOSED CONTOURS
- PROPOSED EMBANKMENT
- ROAD SETBACK LINE

THE FOLLOWING LEGEND INDICATES MARKERS ON INDIVIDUAL BLOCKS WHICH IDENTIFY NOISE ATTENUATION REQUIREMENTS

- A — TYPE A NOISE WARNING CLAUSE
- PROVISION FOR AIR CONDITIONING & TYPE C NOISE WARNING CLAUSE
- NOISE ASSESSMENT TO BE COMPLETED AS PART OF SITE PLAN APPROVAL PROCESS

Road Right-of-way Setback Lines:

Outdoor Living Areas (OLAs)	Comments
Outdoor Living Areas between Newman Drive ℄ (north of southern Street A entrance) & Setback Line 1	Type A noise warning clause required. Note: Setback Line 1 is located approximately 6.60m away from the ROW / Property Line, as shown in the drawing.
Outdoor Living Areas between Newman Drive ℄ (south of southern Street A entrance) & Setback Line 3	Type A noise warning clause required.

Indoor Living Areas Plane of Window (POW)	Comments
Indoor Living Areas between Newman Drive ℄ (north of southern Street A entrance) & Setback Line 2	Type C noise warning clause and forced air heating with provisions for the future installation of central air conditioning required.
Indoor Living Areas between Newman Drive ℄ (south of southern Street A entrance) & Setback Line 4	

WESTCLIFF WAY
STREET C
BISMARK DRIVE
NEWMAN DRIVE
SWMF 2
HALLMAN SUBDIVISION (30T-16104)
STREET E
STREET B
STREET A
CACHET SUBDIVISION (30T-16103)
STREET D
NEWMAN SUBDIVISION (30T-16105)
CITY OF CAMBRIDGE
TOWNSHIP OF NORTH DUMFRIES
SETBACK LINE 1 - DAYTIME OUTDOOR (55dBA) - 23.1m
SETBACK LINE 2 - DAYTIME INDOOR (55dBA) - 24.0m
SETBACK LINE 3 - DAYTIME OUTDOOR (55dBA) - 28.8m
SETBACK LINE 4 - DAYTIME INDOOR (55dBA) - 30.3m
12.6m
STREET F
STREET G
HALLMAN SUBDIVISION
BRIAN DOMM SUBDIVISION
STAGE 1
STAGE 2
STAGE 3
STAGE 4
STAGE 5
Additional Lands Owned by Applicant

SITE
NORTH DUMFRIES
CITY OF CAMBRIDGE
BARRIE'S LAKE
KEY PLAN N.T.S.

GEODETIC BM ELEV. =300.480m
STATION 001196633O8
CONCRETE CYLINDER WITH TOPOGRAPHICAL TABLET ON NORTH SIDE OF GRANT STREET, 10.9m EAST OF INTERSECTION WITH KENMORE AVENUE, IN GRASSED AREA BETWEEN ROADWAY AND SIDEWALK, 1.6m NORTH OF ROADWAY, 1.0m WEST FROM CONCRETE LIGHT STANDARD AND 19.6m FROM CENTRELINE OF DRIVEWAY TO No. 56 GRANT STREET.

SITE BENCHMARK ELEV. =306.341m
CUT CROSS IN CONCRETE SIDEWALK ON EAST CORNER OF BISMARK DRIVE AND WESTCLIFF WAY INTERSECTION. LOCATED APPROX. 14.7m SOUTH EAST ALONG WESTCLIFF WAY CENTRELINE FROM INTERSECTION AND 8.4m NORTH EAST ALONG BISMARK DRIVE CENTRELINE FROM INTERSECTION.

NOTE TO CONTRACTOR :

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED OR REUSED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.	ISSUED FOR APPROVAL	GMK	APR.19/21

TOWNSHIP of NORTH DUMFRIES

MTE
Engineers, Scientists, Surveyors
519-743-6500

OWNER
HALLMAN CONSTRUCTION LIMITED
675 RIVERBEND DRIVE KITCHENER

PROJECT
WESTWOOD VILLAGE PHASE 2
Cambridge Ontario

DRAWING
NOISE ASSESSMENT PLAN

Project Manager G.KORBER	Project No. 02534-800
Design By CJC	Checked By GMK
Drawn By CJC	Checked By GMK
Surveyed By MTE	Drawing No. NA1.1
Date Jan.21/21	
Scale 1:1500	Sheet of

April 26, 2021 - 11:52:41 AM - Plotted By: Charles Carre