

February 12, 2009

Our Reference: 12407

**Lovatt Planning Consultants**

9711 - 141 Street  
Edmonton, AB  
T5Ns2M5

Attention: Olga Lovatt

Dear Olga:

**Reference: Highland Park Traffic Impact Assessment (TIA)**

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## 1.0 Introduction

ISL Engineering and Land Services Ltd. was retained by Lovatt Planning Consultants to assess the impact of the proposed 49 residential units has on traffic volumes along Range Road 14. The proposed development is located at NE ¼ Sec. 17-39-1-W5M in Lacombe County, Alberta and is shown in Exhibit 1.1. Three accesses are proposed to the development:

- Access 1: This access will serve the 15 units at the north end of the development.
- Accesses 2 and 3: These accesses will serve the 34 units at the south end of the development.

## 2.0 Traffic Counts

Traffic counts were conducted along Range Road 14 (adjacent to the development) on Tuesday July 15, 2008 in the AM (7 to 9 AM) and PM (4 to 6 PM) peak hours. From the traffic count, the traffic volumes along Range Road 14 were relative light and are as follows:

- AM Peak: 3 veh/h northbound, 3 veh/h southbound
- PM Peak: 4 veh/h northbound, 3 veh/h southbound

## 3.0 Future Volumes

Alberta Transportation's (AT) TIA standards were used as the basis for this TIA. AT requires the analyses to include the 20-year horizon, thus the existing traffic volumes on Range Road 14 were factored up to the 20-year horizon using the average Provincial growth rate of 2.5% (linear) per year. The 20-year traffic background volumes along Range Road 14 remained relative light and are as follows:

- AM Peak: 5 veh/h northbound, 5 veh/h southbound
- PM Peak: 6 veh/h northbound, 5 veh/h southbound

## 4.0 Generated Trips

Trips generated from the development in the peak hours were derived from the Institute of Transportation Engineer (ITE) Trip Generation Manual, 7<sup>th</sup> Edition, and are shown below in Table 4.1:

*Table 4.1 Trip Generations*

Trip Generation	ITE	AM Peak			PM Peak		
Land Use	Land Use	Rate	Total Trips	Trips In/Out	Rate	Total Trips	Trips In/Out
Residential (49 Units)	Single-Family Detached Housing	0.75/unit	37	(25%/75%) 9/28	1.01/unit	50	(63%/37%) 32/18

The above generated trips were distributed onto Range Road 14 based on the assumption the 80% of the generated trips would travel to/from the south on Range Road 14 and 20% would travel to/from the north on Range Road 14. These trips were added to the 20-year background traffic and the final trips are shown in Exhibit 4.1.

## 5.0 Traffic Analyses

The Synchro 6.0 computer analysis package was used to analyze the operational characteristics of the three unsignalized intersections on Range Road 14. A Level of Operating Service (LOS) A represents the highest level of service or generally “free flow conditions” while a LOS F generally represents a “breakdown” or “gridlock” condition in vehicular flow. There are varying degrees of delay and congestion introduced at the intermediate LOS B, C, D, and E levels. LOS D is representative of “normal” peak hour congestion, and is generally the accepted performance criterion for design analysis. The LOS for an unsignalized intersection is based on the average time delay per vehicle, as per Table 5.1 below.

*Table 5.1 LOS Criteria for Unsignalized Intersections*

LOS	Average Delay per Vehicle (s / veh)
A	< 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 – 50
F	> 50

Synchro also calculates each movement’s volume to capacity ratio (v/c). A v/c ratio of 1.0 represents an intersection at full capacity with no ability to facilitate extra vehicles. Typically, a v/c ratio of 0.85 or better for all intersection movements is the accepted standard for peak hour operations.

Finally, Synchro also calculates the 95<sup>th</sup> percentile vehicle queue length for each intersection movement, which provides the criteria for left and right turn storage requirements. This queue length is exceeded 5% of the time, which is accepted practice for normal peak hour operation.

The results of the analyses are as follows:



Table 5.2 Synchro Summary

INTERSECTION / MOVEMENT			20-Year Background + Development					
			AM PEAK HOUR			PM PEAK HOUR		
			v/c Ratio	LOS	Queue Length 95 <sup>th</sup> (m)	v/c Ratio	LOS	Queue Length 95 <sup>th</sup> (m)
Access 1 / RR 14 (Unsignalized)	EB	LT/RT	0.01	A	0.2	0.01	A	0.1
	NB	LT/TH	0.00	A	0.0	0.00	A	0.1
	SB	TH/RT	0.00	A	0.0	0.01	A	0.0
Access 2 / RR 14 (Unsignalized)	EB	LT/RT	0.01	A	0.2	0.01	A	0.1
	NB	LT/TH	0.00	A	0.0	0.01	A	0.1
	SB	TH/RT	0.01	A	0.0	0.01	A	0.0
Access 3 / RR 14 (Unsignalized)	EB	LT/RT	0.01	A	0.2	0.01	A	0.1
	NB	LT/TH	0.00	A	0.0	0.01	A	0.1
	SB	TH/RT	0.01	A	0.0	0.01	A	0.0

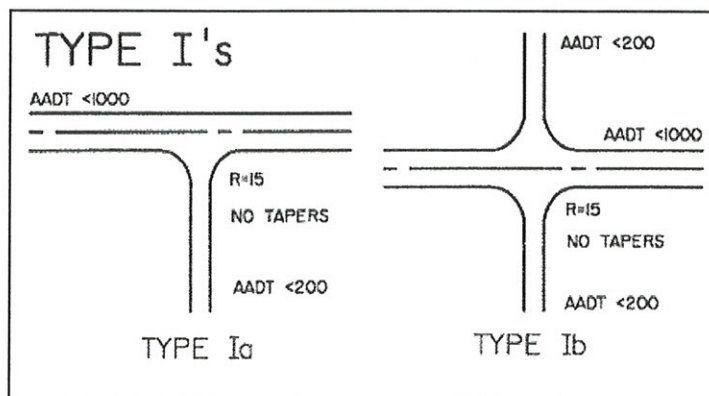
From Table 5.2, all movements at all three intersections operated at LOS A with very low v/c ratios.

## 6.0 Range Road 14 Volume Analyses

From Table 1.3.4.1 in the Transportation Association of Canada's Design Guide, a rural local road (Range Road 14) has a typical maximum daily volume of 1,000 vehicles a day. The daily traffic on Range Road 14 was calculated by multiplying the sum of the AM and PM Peak hour volumes by 5, a conservative approach. The AADT of Range Road 14 (with the proposed development) in the 2028 horizon is 450, which is below the typical 1,000 vehicles per day threshold.

## 7.0 Intersection Warrant Analyses

From Figure D-7.4 in AT's "Geometric Design Guide", based on the 20-year traffic volumes (with development), all three intersections along Range Road 14 is warranted as a Type I intersection (see below). The warrant is based on daily traffic volumes on Range Road 14 (450 vehicles per day) and the daily traffic volumes at the site access (150 vehicles per day).



## **8.0 Conclusions**

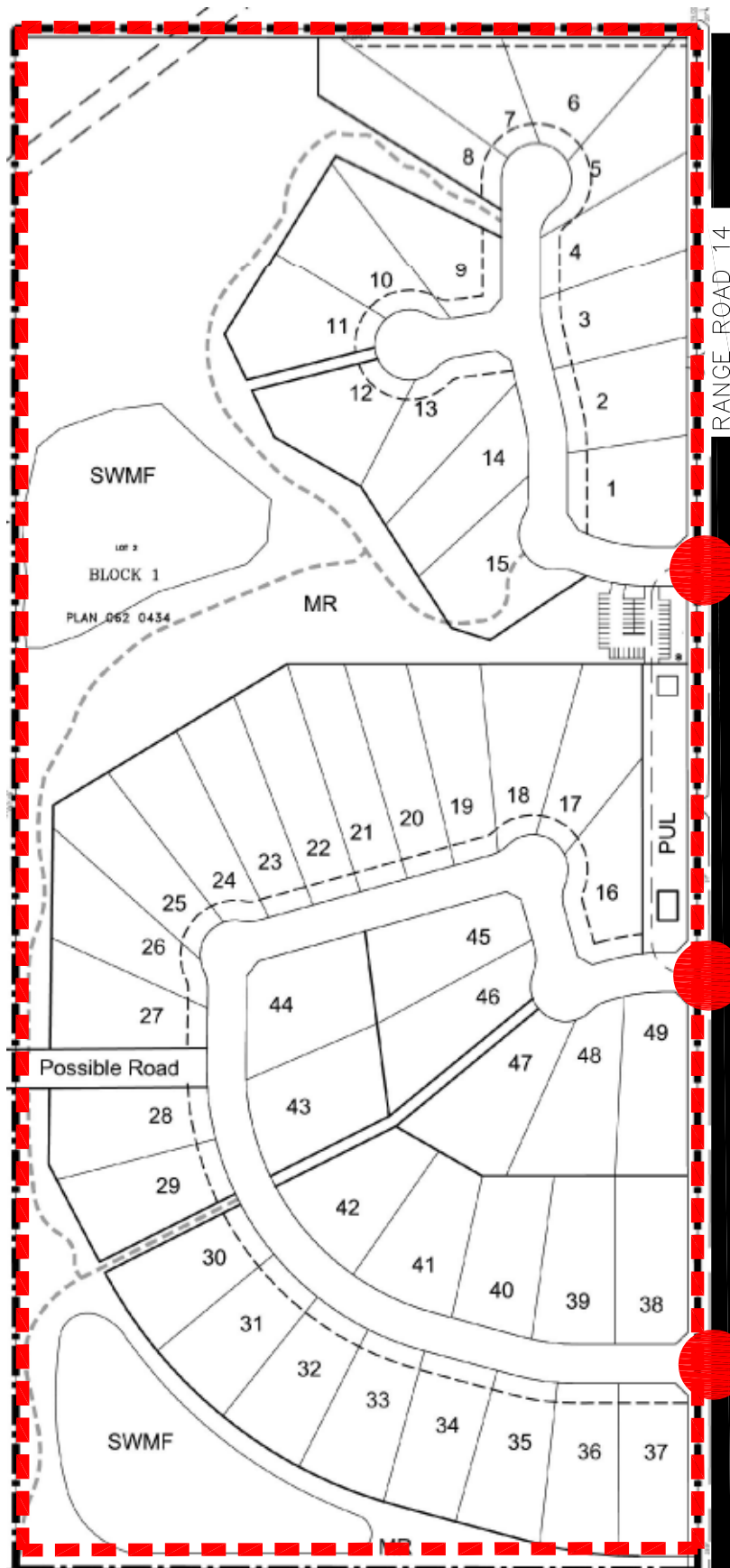
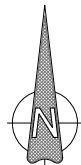
The 49 single-family residential units of Highland Park generated 37 vehicles in the AM and 50 vehicles in the PM. These generated traffic were added onto the 20-year horizon background traffic on Range Road 14 and analyzed. From the traffic analyses, all three intersections of Highland Park operated at LOS A with low v/c ratios. In addition, the daily traffic volume on Range Road 14 is below the typical maximum level of 1,000 veh/day and a Type I intersection was warranted.

If you have any questions in regards to this letter, please don't hesitate to call myself at 403-254-0544.

Thank You,

A handwritten signature in blue ink, appearing to read 'Alex Ho', is positioned above the printed name.

Alex Ho, P.Eng  
Transportation Engineer



## LEGEND



= SITE BOUNDARY



= ACCESS

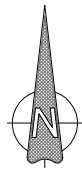
ACCESS 1

ACCESS 2

ACCESS 3

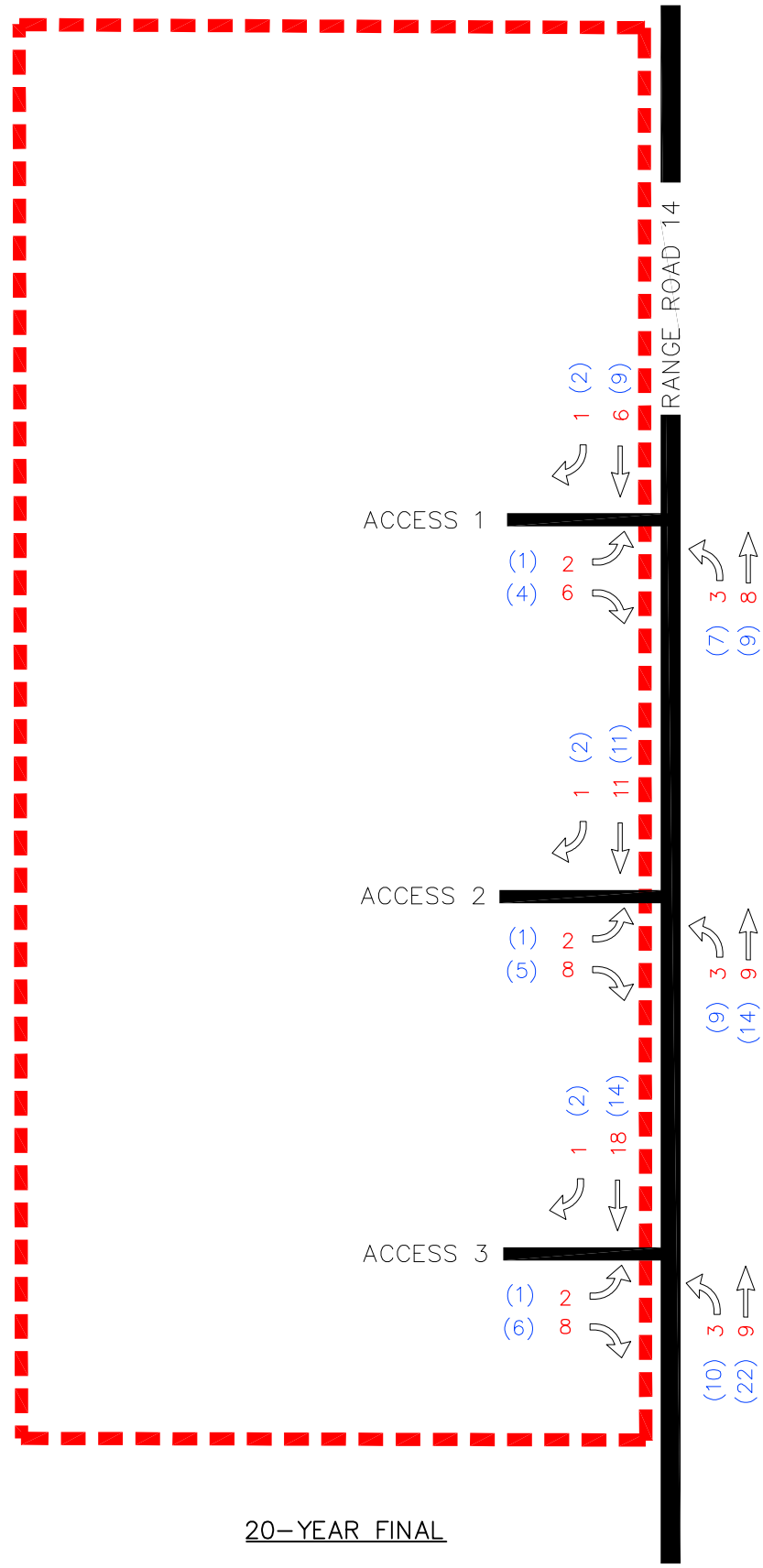
# HIGHLAND PARK TRAFFIC IMPACT ASSESSMENT

SITE PLAN



LEGEND

- = SITE BOUNDARY
- 999 = AM PEAK
- (999) = PM PEAK



20-YEAR FINAL



HIGHLAND PARK  
TRAFFIC IMPACT ASSESSMENT

20-YEAR FINAL  
PEAK HOUR TRAFFIC VOLUMES