

TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION

LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County

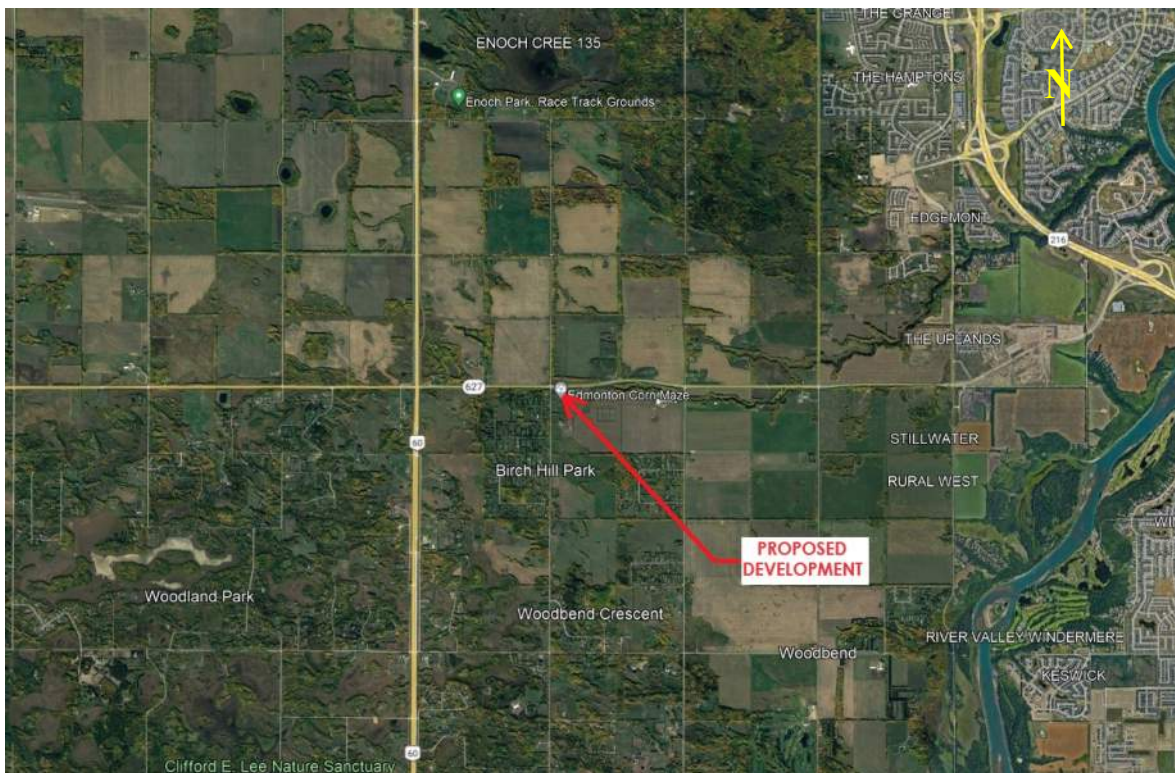
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)



LOCATION PLAN L-1



LOCATION PLAN L-2



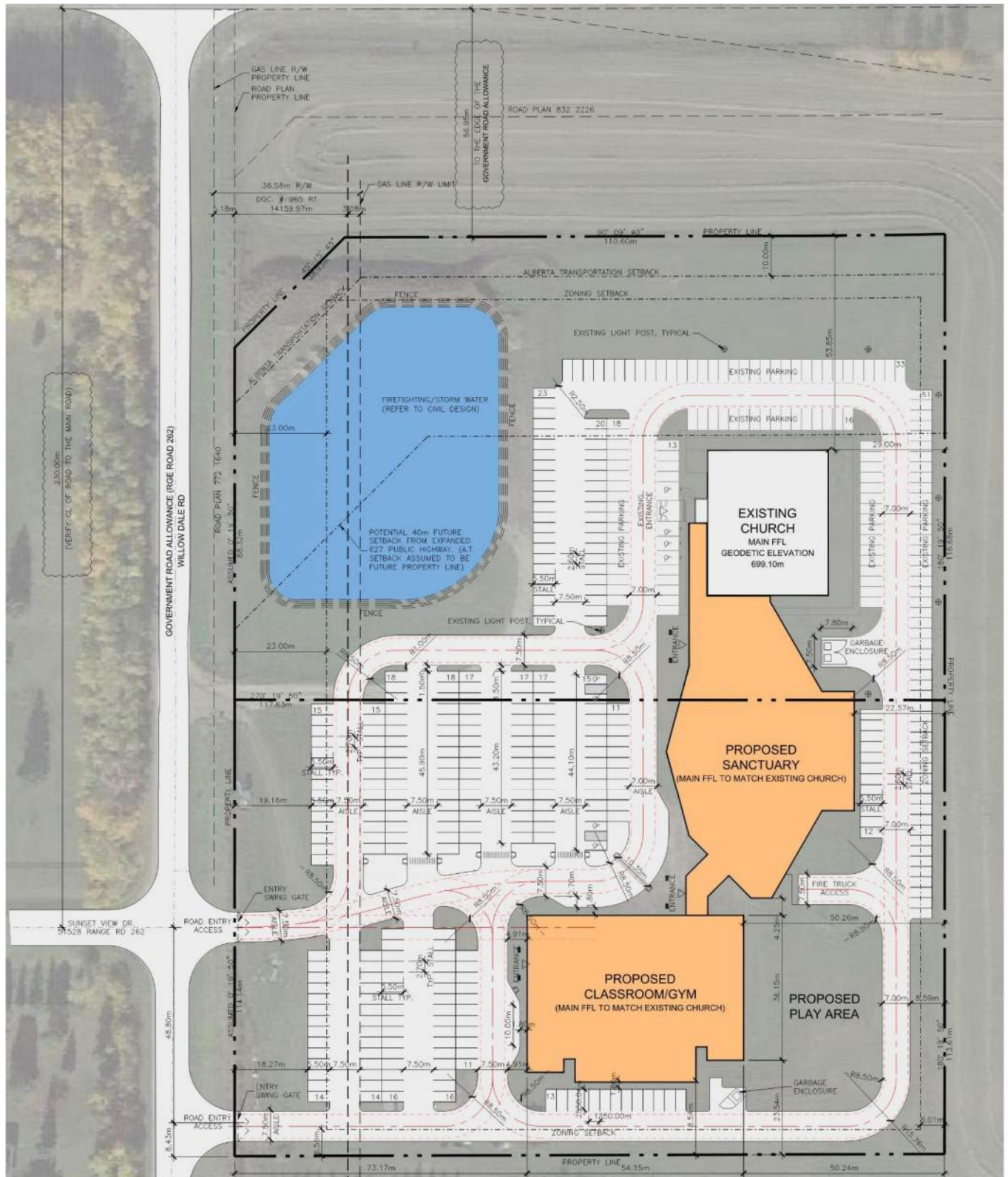
LOCATION PLAN 3



SPIN PLAN S-1



DEVELOPMENT PLAN D-1



DEVELOPMENT PLAN D-2

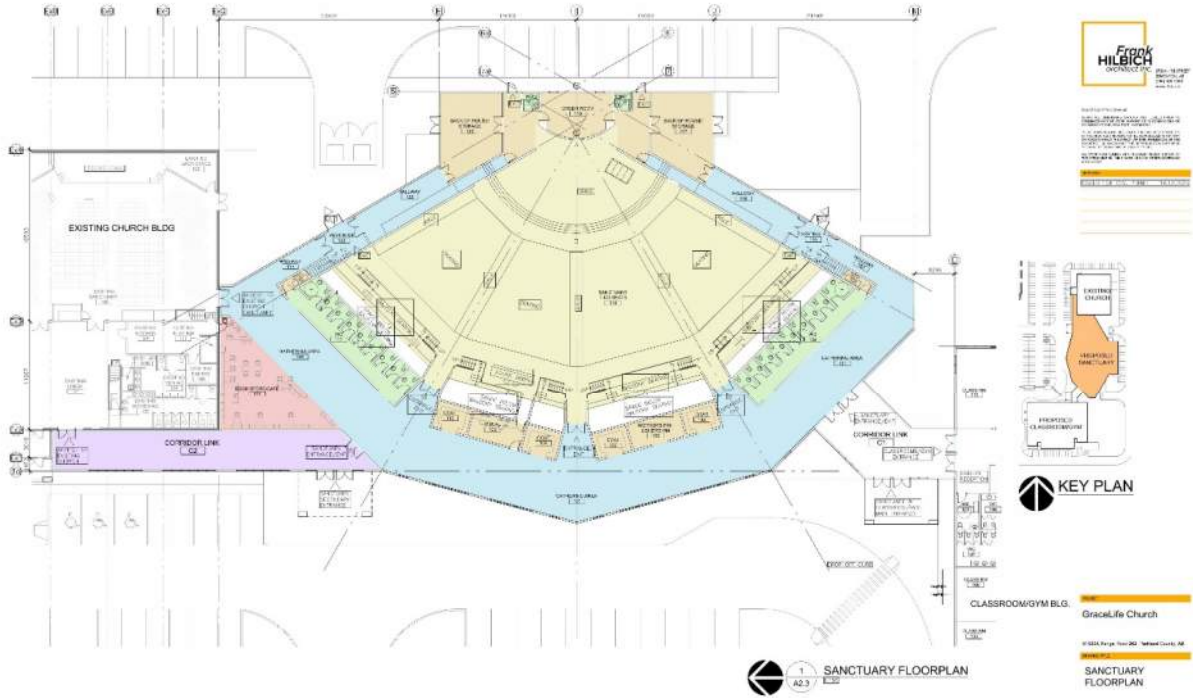


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1. INTRODUCTION

This report is a Traffic Impact Assessment (TIA) report for an expansion of the GraceLife Church facilities within Lot 1A and Lot 1B, Block 1, Plan 1020669 within the NW quarter section of Section 35, Township 51, Range 26, West of 4th Meridian. See Location Plans before this report.

This report has been prepared to determine the impact of the proposed development on traffic using Willowdale Road (Rge. Rd. 262) and Highway 627:04, southwest of Edmonton. The scope of work in this case, is to assess the roadways for adequacy and any required intersection treatment as a result of the increased traffic volumes and turning movements attributed to the development. This document will address the following:

- Collect 2022 traffic volume data.
- Determine present traffic volumes for 2023.
- Determine projected traffic volumes to 2024, 2034 and 2044.
- Determine traffic volumes generated from the development.
- Determine combined traffic volumes for 2024, 2034 and 2044.
- Complete intersectional analysis of the intersections with Highway 627:04 (Garden Valley Road) at Willowdale Road (Range Road 262).
- Identifies geometric deficiencies based on current 3R/4R guidelines.
- Review sight distance requirements.
- Complete illumination and signalization warrant analysis, if required.
- Provides a preliminary engineering cost estimate for recommended improvements.

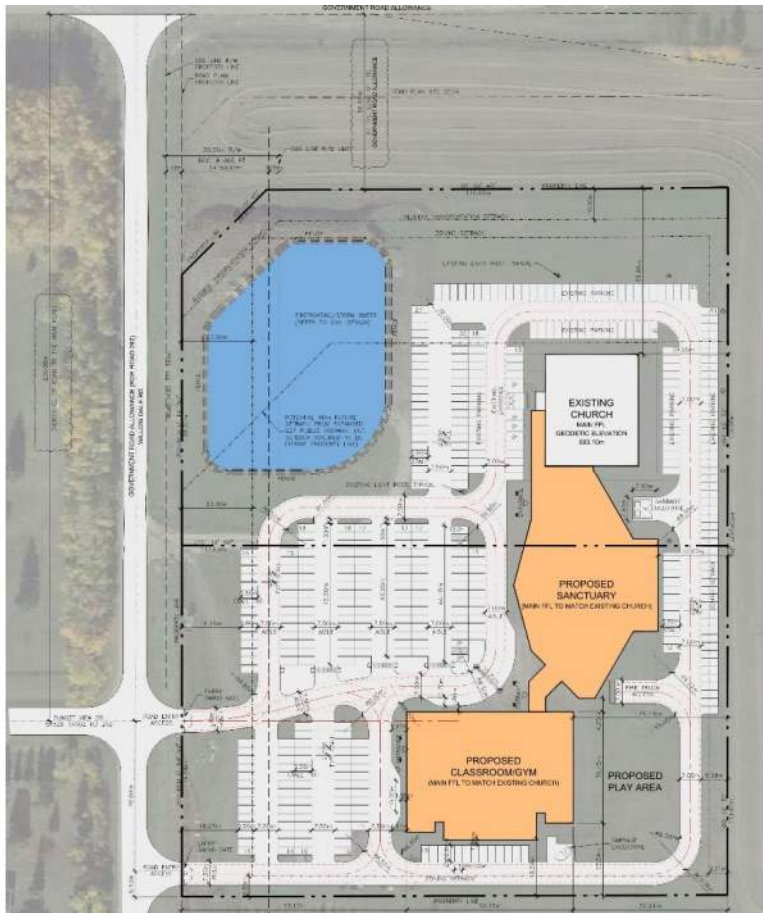
This report is based on information provided by owners of the land and developers of the site, site observations from Mr. Darcy Paulichuk, P. Eng., traffic volume data from Alberta Transportation, intersectional analysis procedures and standards documented in Alberta Infrastructure and Transportation's "Highway Geometric Design Guide", 1999, and Alberta Infrastructure and Transportation's "Traffic Impact Assessment Guideline", 2005.

This report has been prepared for owners of the land and developers of the site for purposes of gaining approval from municipal and provincial governments for the development of this site.

2. PROPOSED DEVELOPMENT

2.1 Development Details

The proposed development comprises of an expansion to the existing GraceLife Church site with the addition of a Sanctuary building and a Classroom/Gym building located within Lot 1A and Lot 1B in Block 1 in Plan 1020669 (4.04 ha) within NW 35-51-26-W4M as shown below. The expansion includes significant expansion of the parking lot and the addition of a Stormwater Management Pond. Access to the site would be made utilizing two new accesses on Willowdale Road (Range Road 262) and then to Highway 627:04 (Garden Valley Road).



FIRE WATER CALCULATION

EXISTING CHURCH
 BUILDING VOLUME: 8,100 m³
 10.4 m³ (0.00011) LITERS / m³
 WATER DEMAND: 1.0 L/s
 FIRE FIGHTING: 2 - 1,000 L/min @ 15' = 30,000 L/min

PROPOSED SANCTUARY
 BUILDING VOLUME: 11,200 m³
 10.4 m³ (0.00011) LITERS / m³
 WATER DEMAND: 1.0 L/s
 FIRE FIGHTING: 2 - 1,000 L/min @ 15' = 30,000 L/min

PROPOSED CLASSROOM/GYM
 BUILDING VOLUME: 11,200 m³
 10.4 m³ (0.00011) LITERS / m³
 WATER DEMAND: 1.0 L/s
 FIRE FIGHTING: 2 - 1,000 L/min @ 15' = 30,000 L/min

TOTAL
 WATER DEMAND: 3.0 L/s
 FIRE FIGHTING: 60,000 L/min

SITE DEVELOPMENT ANALYSIS

Legal Address: 1020669, NW-35-51-26-W4M
 Project Name: GraceLife Church Expansion
 City: Parkland County
 Zoning: R-100 (Residential Single-Family)
 Lot Area: 10.4 ha (25.8 acres)
 Total Area: 10.4 ha (25.8 acres)
 Proposed Development: 10.4 ha (25.8 acres)
 Proposed Building: 22,400 m²
 Proposed Parking: 100 spaces
 Proposed Stormwater: 100,000 L/day
 Proposed Stormwater Pond: 100,000 L/day
 Proposed Stormwater Pond: 100,000 L/day

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 Edmonton, Alberta T5C 1H4
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 Fax: (780) 443-1112
 Email: info@frankhilbich.com

GraceLife Church
 1020669, NW-35-51-26-W4M
 Parkland County, Alberta
 Project No. 1020669

SITE PLAN

SCALE: AS NOTED
 DATE: SEPTEMBER 20, 2023
 PROJ. NO.: 1020669

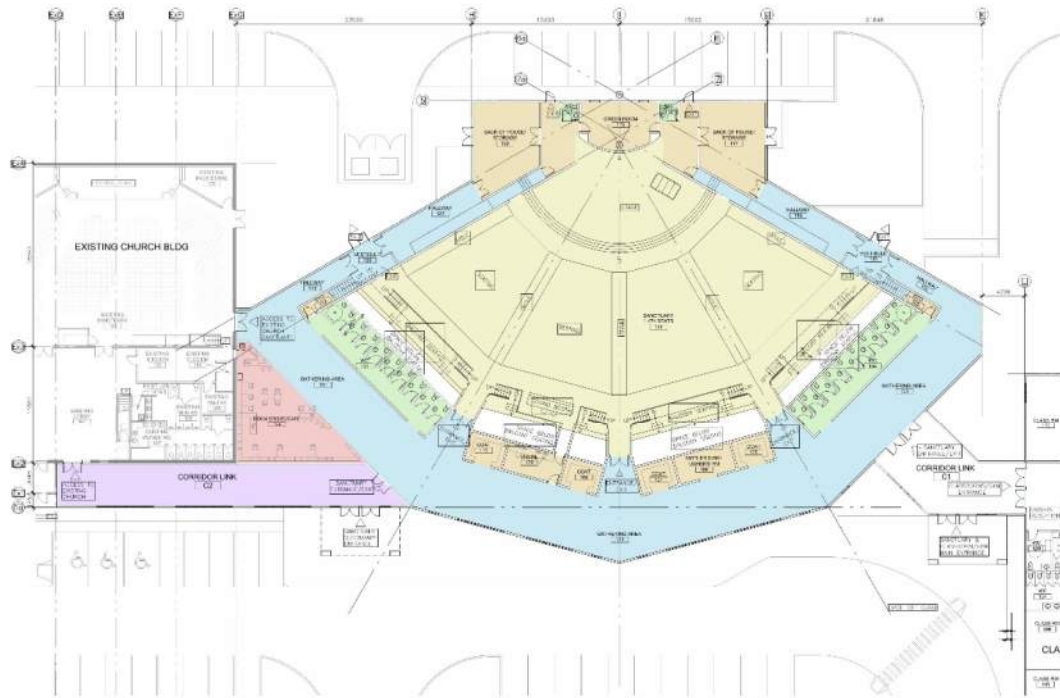
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The existing access to the site will be closed. The first access will be constructed directly across of Sunset View Drive to the west.

The details on the building spaces are shown below.

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LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)



1 A2.3 SANCTUARY FLOORPLAN

Frank HILBICH
 ARCHITECTURE INC.
 2750 16th Street SW
 Calgary, AB T2M 4K6
 TEL: 403-243-1111
 WWW.FRANKHILBICH.COM

DATE: 2020-09-14
 SCALE: AS SHOWN



KEY PLAN

PROJECT
 GraceLife Church

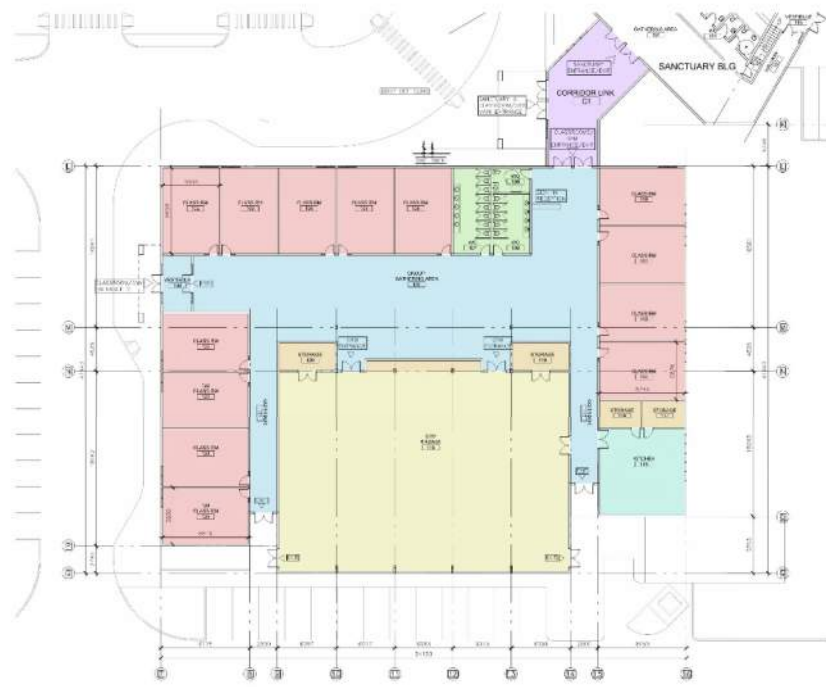
LOCATION
 11000 Highway 627, NW, Parkland County, AB

DATE
 2020-09-14, 2021-01-20

SCALE
 AS SHOWN

PROJECT NO.
 21-208

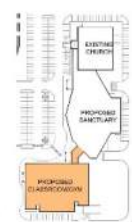
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1 A2.6 CLASSROOM/GYM FLOORPLAN

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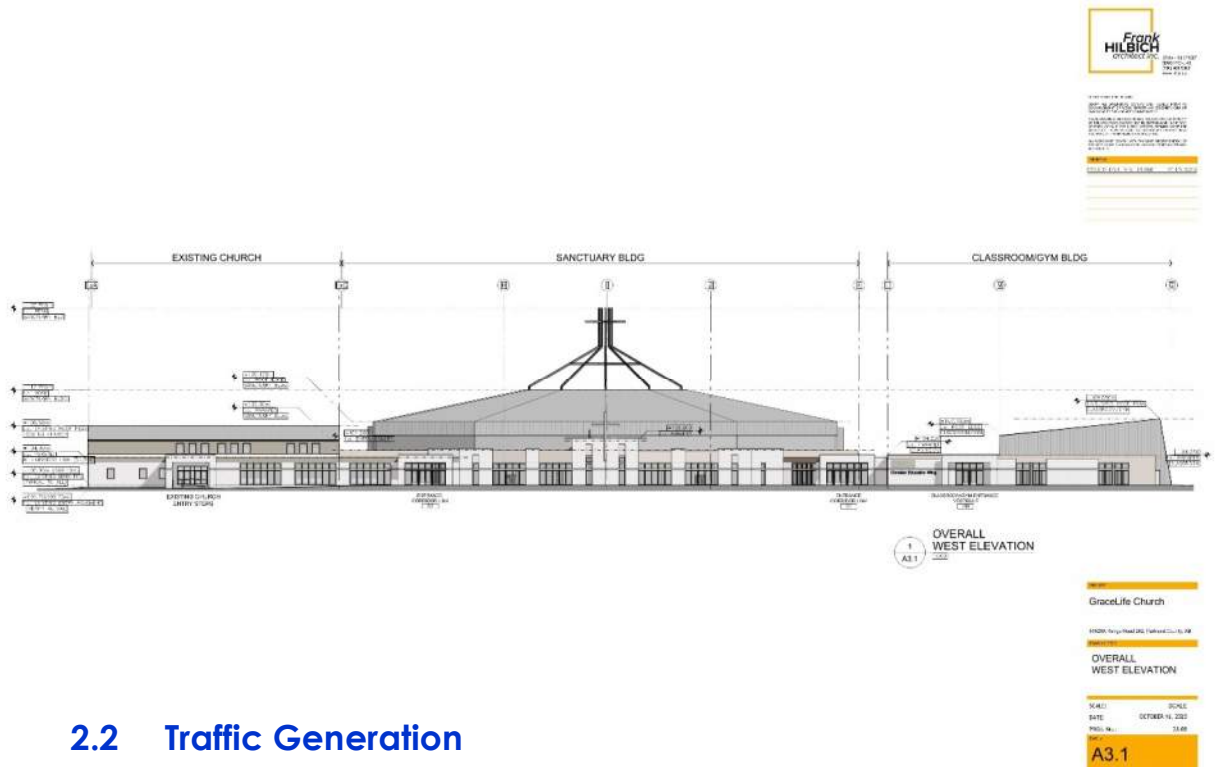
LOCATION
 11000 Highway 627, NW, Parkland County, AB

DATE
 2020-09-14, 2021-01-20

SCALE
 AS SHOWN

PROJECT NO.
 21-208

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2.2 Traffic Generation

The proposed expansion is projected to add traffic to the site for use of the new facilities as follows:

- Mondays: No activities planned.
- Tuesdays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
- Wednesdays: Late Morning Use: 80 vehicles from 9:30am to 11:30am
- Wednesdays: Evening Family Use: 60 families from 7:00pm to 10:00pm
- Thursdays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
- Fridays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
(2 times per month only)
- Saturdays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
(2 times per month only)
- Sundays: Daily Use: Regular use as per past; already accounting for in traffic

Overall, the increase in traffic for this site could be summarized to add 80 trips per day on the average. On Wednesdays the traffic volume peaks at approximately 140 trips in and 140 trips out for the whole day. On Mondays and every second Fridays & Saturdays, there may be no additional trips all day.

It is important to note that none of this increased activities and additional traffic generation will occur during the AM Peak Weekday Hour (7:30am – 8:30am) of traffic or the PM Peak Weekday Hour (4:30pm – 5:30pm) of traffic for the local roadways and highways in the area.

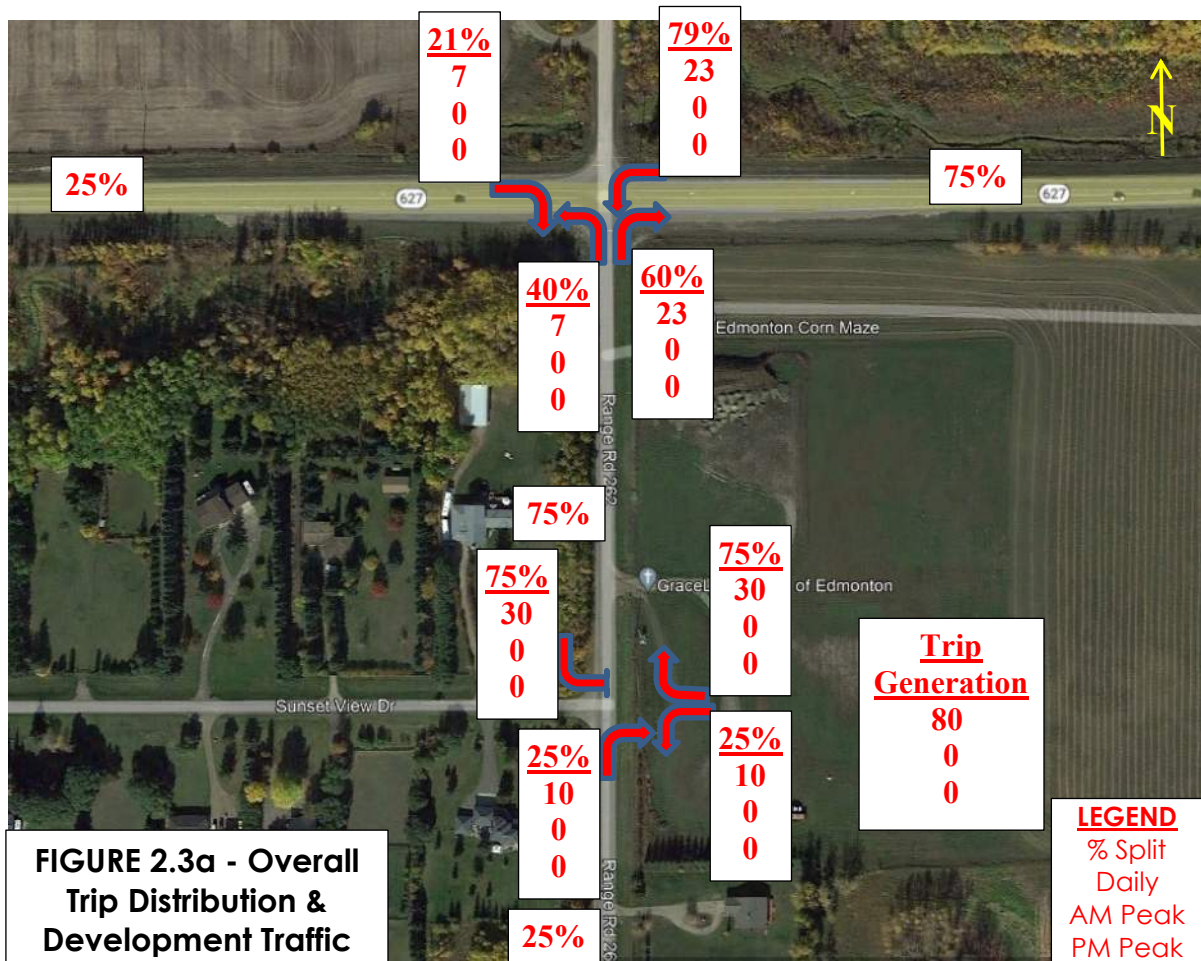
Projected Traffic Summary

Daily Traffic:	= 80 trips per day
AM Peak Hour:	= 0 trips per hour
PM Peak Hour:	= 0 trips per hour

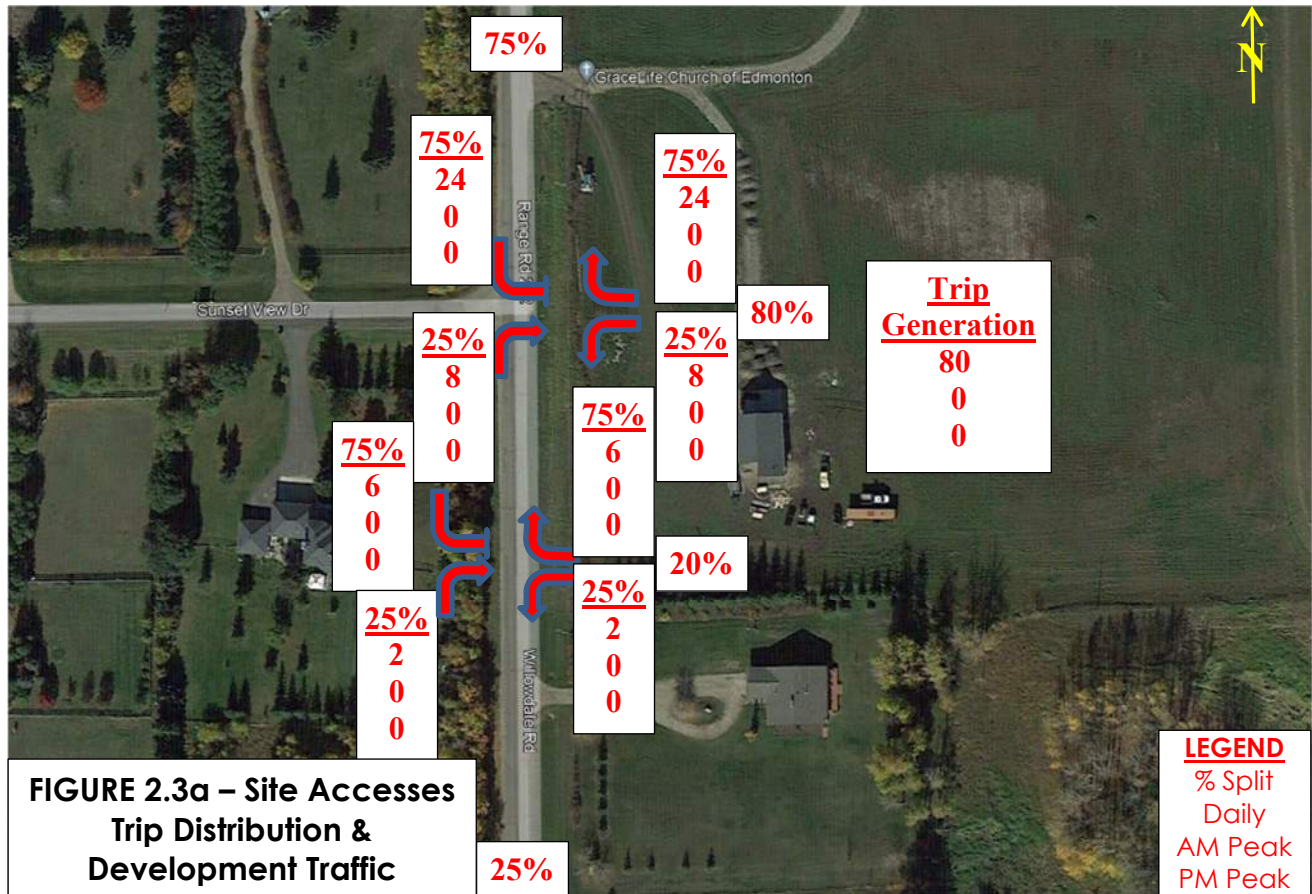
These values above represent the traffic generation once the development is fully built and operating.

2.3 Trip Distribution & Development Traffic

Development traffic is projected to distribute similarly to existing traffic at the intersection of Highway 627:04 & Rge. Rd. 262 as follows:



The trip distribution is for the access to the site is assumed as shown above. For the trip distribution between the two proposed accesses, the traffic splits and projections are shown below.



The two accesses are proposed to be spaced 48.8m apart. The north access is to align with the Sunset View Drive to the west to form a 4-legged intersection with Rge. Rd. 262. The south access will create a new T-intersection with Rge. Rd. 262 to the south of Sunset View Drive.

3. EXISTING CONDITIONS

3.1 Physical Properties

Highway 627:04 traverses between the Junction of Highway 779 and the City of Edmonton.

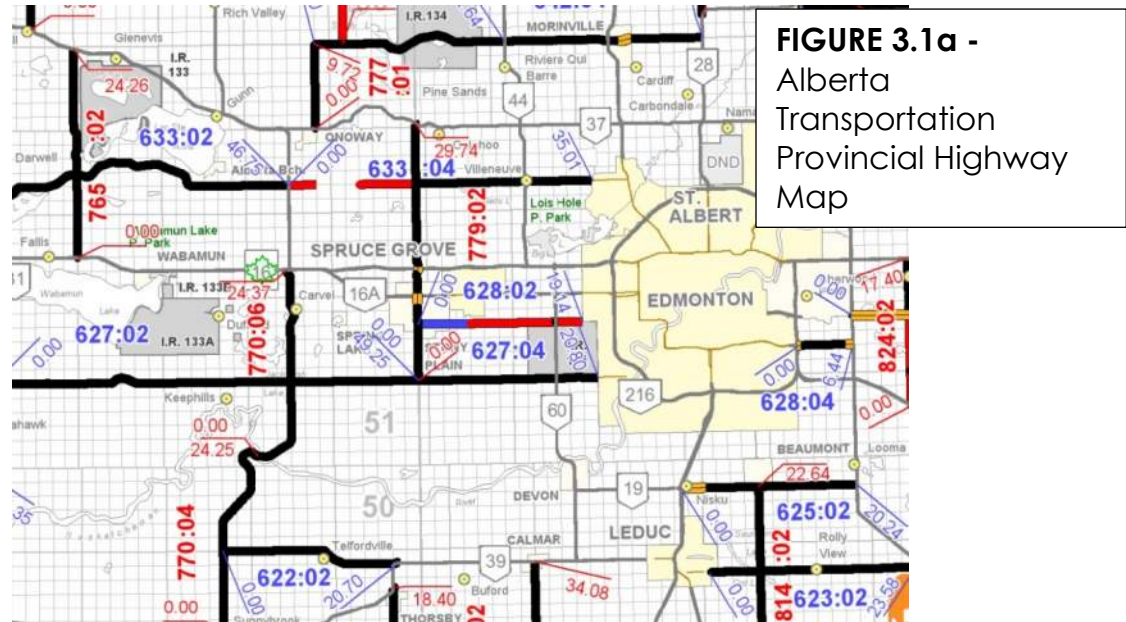


FIGURE 3.1a -
 Alberta
 Transportation
 Provincial Highway
 Map

Hwy. 627:04 is classified as a Level 3 roadway in accordance with Alberta Transportation's "Provincial Highway Service Classification System". Level 3 roadways typically carry traffic from major generators such as communities and/or resource and developments but with overall shorter travel distances. These roadways provide the connection between Level 4 and Level 2 roadways, and generally serve traffic of an intra regional or inter county nature.



FIGURE 3.1b -
 Alberta Transportation
 Highway Classification
 Map

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Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

The intersection of Hwy. 627:04 and Rge. Rd. 262 exists approximately at km 17.54. The intersection is on a horizontal tangent. The intersection is on a -0.4% grade, sloping to the east. The sight distance appears to be greater than 650m in both directions.

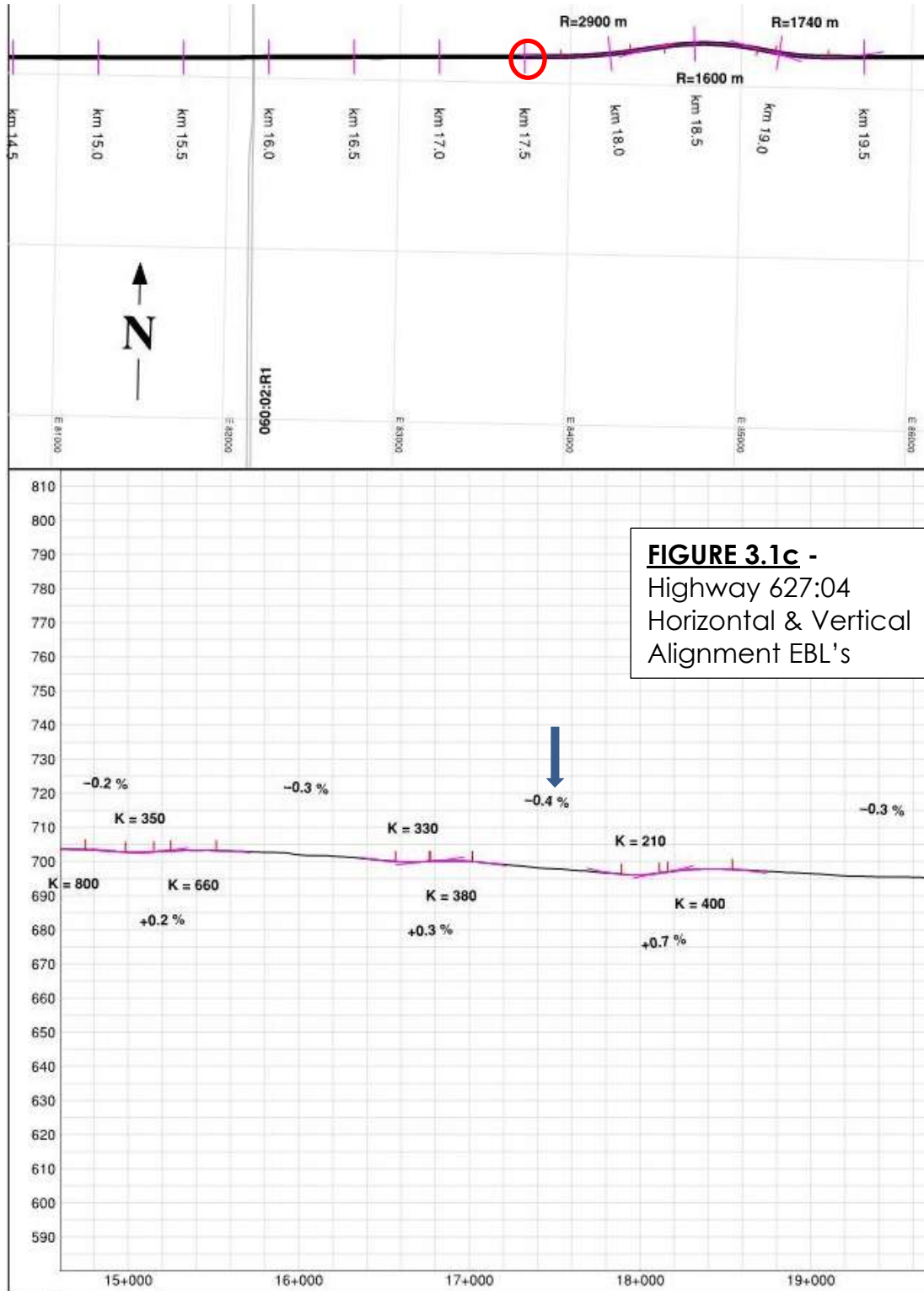
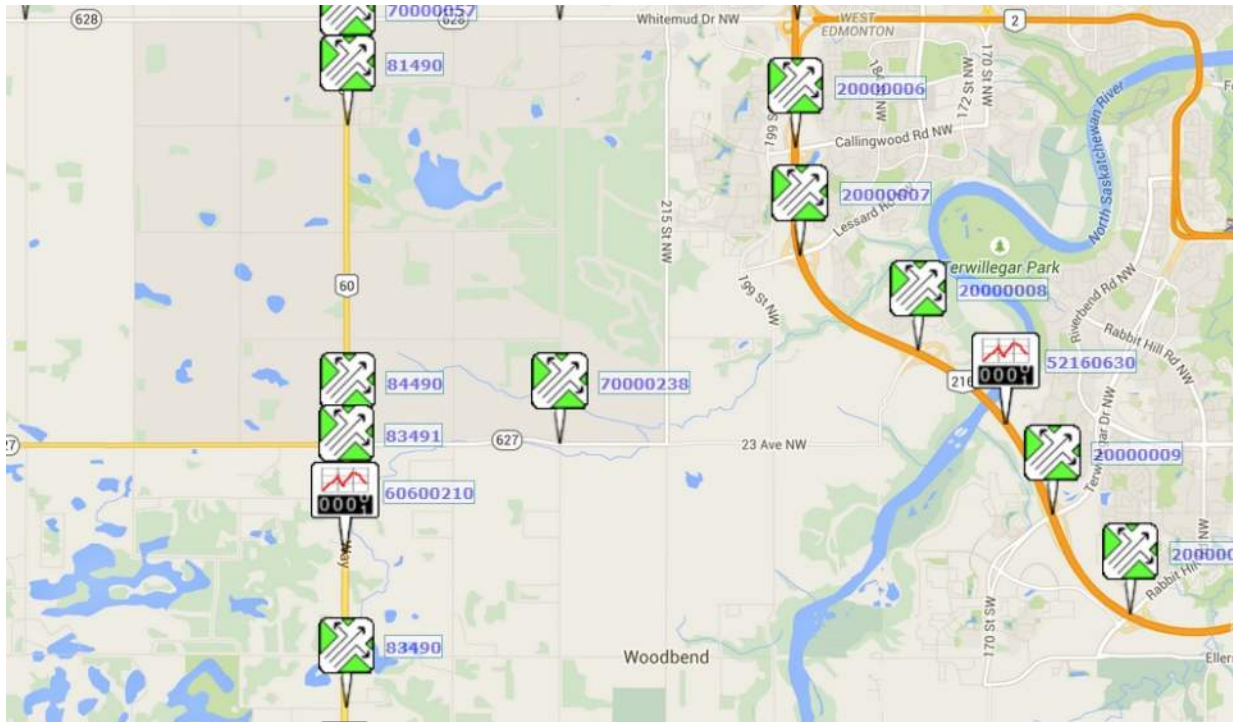


FIGURE 3.1c -
 Highway 627:04
 Horizontal & Vertical
 Alignment EBL's

3.2 Traffic Properties

Existing Alberta Transportation intersectional traffic count locations are shown in the map below:



The AT website <https://www.transportation.alberta.ca/mapping/> has traffic counts available that are relevant for comparison purposes for this assessment. There is no specific traffic count available for the intersection of Hwy. 627:04 and Rge. Rd. 262, however there are counts located at the junction of Highway 60 and Rge. Rd. 261.

See below.

Table-2.2a: 2022 AADT and ASDT from Alberta Highways Traffic Volume History

Intersection Leg	2022 AADT Hwy. 627	2022 ASDT Hwy. 627	2022 % Trucks Hwy. 627
60 & 627 W of Edmonton (84490)	3860	4450	3.9%
627 & Rge Rd 261 (Fleming Road) (7000238)	4360	5030	2.9%

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GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M

Parkland County

Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

Reference Number:
84490

Intersection of:
60 & 627 W OF EDMONTON

North On: 60	Vehicle Type	Volume	%
	A: Passenger Vehicle	8,270	84.4%
	B: Recreational Vehicle	124	1.3%
	C: Bus	30	0.3%
	D: Single Unit Truck	496	5.1%
	E: Tractor Trailer Unit	880	9.0%
		AADT	9,800
		ASDT	11,320

2022 AADT / ASDT Estimates			
Leg AADT Volumes			
		9,800	
6,460			3,860
		12,040	
Total Entering Volume: 16,080			

From North			
4,900			
	Right	Thru	Left
	810	3,850	240
A	659	3,247	203
B	2	60	3
C	3	10	4
D	40	178	25
E	106	355	5

To North	
4,900	
	Volume
A	4,161
B	59
C	13
D	253
E	414

To West	
3,220	
	Volume
A	2,908
B	21
C	13
D	101
E	177

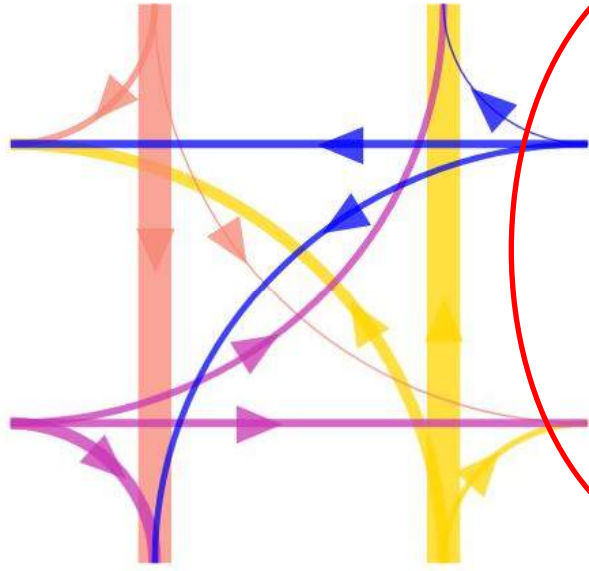
West On: 627	Volume	%
A	5,818	90.1%
B	48	0.7%
C	27	0.4%
D	214	3.3%
E	353	5.5%
AADT		6,460
ASDT		7,460

From West			
3,240			
	Left	Thru	Right
	820	970	1,450
A	667	932	1,311
B	3	3	21
C	4	6	4
D	37	25	51
E	109	4	63

From East			
1,920			
	Left	Thru	Right
	720	970	230
A	706	924	191
B	3	3	2
C	2	7	2
D	8	25	29
E	1	11	6

East On: 627	Vehicle Type	Volume	%
	A: Passenger Vehicle	3,667	95.0%
	B: Recreational Vehicle	20	0.5%
	C: Bus	24	0.6%
	D: Single Unit Truck	122	3.2%
	E: Tractor Trailer Unit	27	0.7%
AADT		3,860	
ASDT		4,450	

To East	
1,940	
	Volume
A	1,846
B	12
C	13
D	60
E	9



ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

ASDT: Average Summer Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

To South	
6,020	
	Volume
A	5,264
B	84
C	16
D	237
E	419

From South			
6,020			
	Left	Thru	Right
	1,440	3,850	730
A	1,325	3,303	711
B	16	54	6
C	3	7	3
D	36	187	10
E	60	299	0

South On: 60	Vehicle Type	Volume	%
	A: Passenger Vehicle	10,603	88.1%
	B: Recreational Vehicle	160	1.3%
	C: Bus	29	0.2%
	D: Single Unit Truck	470	3.9%
	E: Tractor Trailer Unit	778	6.5%
AADT		12,040	
ASDT		13,880	

NOTE:
Coloured line thickness corresponds to turning movement volume.

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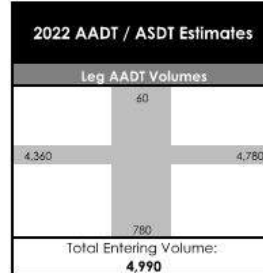
Parkland County

Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

Reference Number:
70000238

Intersection of:
627 & RGE RD 261 (FLEMING RD) 35-51-26-400000000

Vehicle Type	Volume	%
A: Passenger Vehicle	58	96.7%
B: Recreational Vehicle	0	0.0%
C: Bus	0	0.0%
D: Single Unit Truck	0	0.0%
E: Tractor Trailer Unit	2	3.3%
AADT	60	
ASDT	80	



From North			
	Right	Thru	Left
	10	10	10
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To North		
	Right	Thru
A		28
B		0
C		0
D		0
E		2

To West		
	Right	Thru
A		2,084
B		6
C		19
D		52
E		9

From West		
	Left	Thru
A		2,013
B		4
C		13
D		55
E		5

To East		
	Right	Thru
A		2,310
B		4
C		14
D		57
E		5

From East		
	Left	Thru
A		2,007
B		6
C		18
D		45
E		4

To South		
	Right	Thru
A		380
B		1
C		2
D		13
E		4

From South		
	Left	Thru
A		10
B		0
C		0
D		7
E		0

Volume	%
A: 4,187	96.0%
B: 10	0.2%
C: 34	0.8%
D: 111	2.5%
E: 18	0.4%
AADT	4,360
ASDT	5,030

From East		
	Left	Thru
A		2,007
B		6
C		18
D		45
E		4

Vehicle Type	Volume	%
A: Passenger Vehicle	4,615	96.5%
B: Recreational Vehicle	11	0.2%
C: Bus	32	0.7%
D: Single Unit Truck	111	2.3%
E: Tractor Trailer Unit	11	0.2%
AADT	4,780	
ASDT	5,530	

ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
 Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

ASDT: Average Summer Daily Traffic.
 Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

To South		
	Right	Thru
A		380
B		1
C		2
D		13
E		4

From South		
	Left	Thru
A		10
B		0
C		0
D		7
E		0

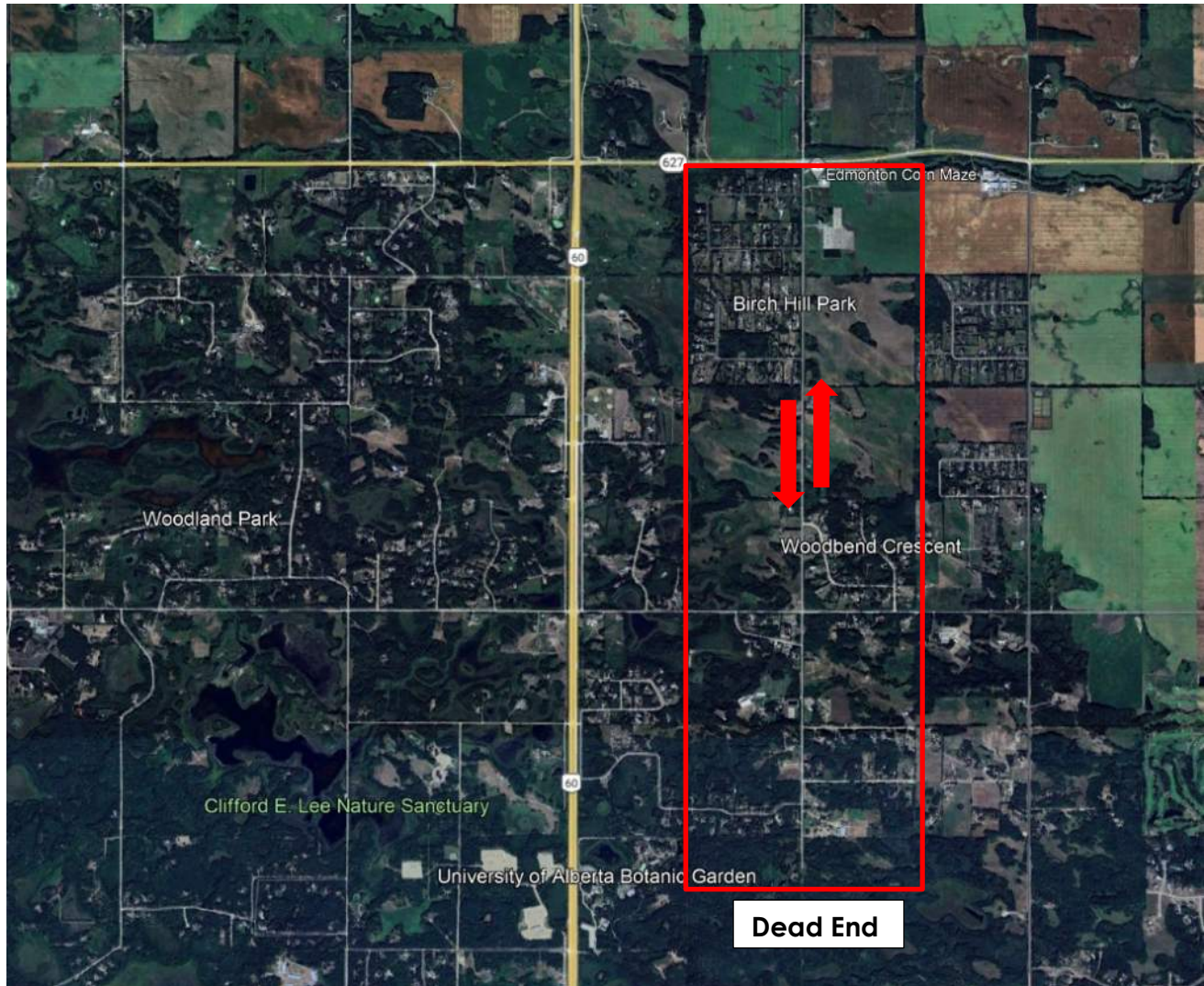
Vehicle Type	Volume	%
A: Passenger Vehicle	744	95.4%
B: Recreational Vehicle	1	0.1%
C: Bus	4	0.5%
D: Single Unit Truck	22	2.8%
E: Tractor Trailer Unit	9	1.2%
AADT	780	
ASDT	890	

NOTE:
 Coloured line thickness corresponds to turning movement volume.

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Between the two traffic counts, there is a noticeable increase of 500 vehicles from the east leg of the Hwy. 60 count and the west leg of the Rge. Rd. 621 count. Most of this is likely attributed to the traffic coming from Rge. Rd. 262 south. If review of the traffic collection basin for the area surrounding Range Road 262 south of Highway 627:04, the following traffic volumes can be projected:



This area includes the following developments and estimated weekday trips:

170 Country Residential Homes:	170 units x 6.5 trips per day =	1105 trips/day
8 Farmsteads:	8 units x 12 trips per day =	96 trips/day
2 Equestrian Business & Farmstead:	2 units x 30 trips per day =	60 trips/day
1 Businesses:	1 unit x 25 trips per day =	25 trips/day
1 RV Storage Business: (past TIA)	=	37 trips/day
GraceLife Church:	(weekday only) =	10 trips/day
TOTAL:		1333 trips/day

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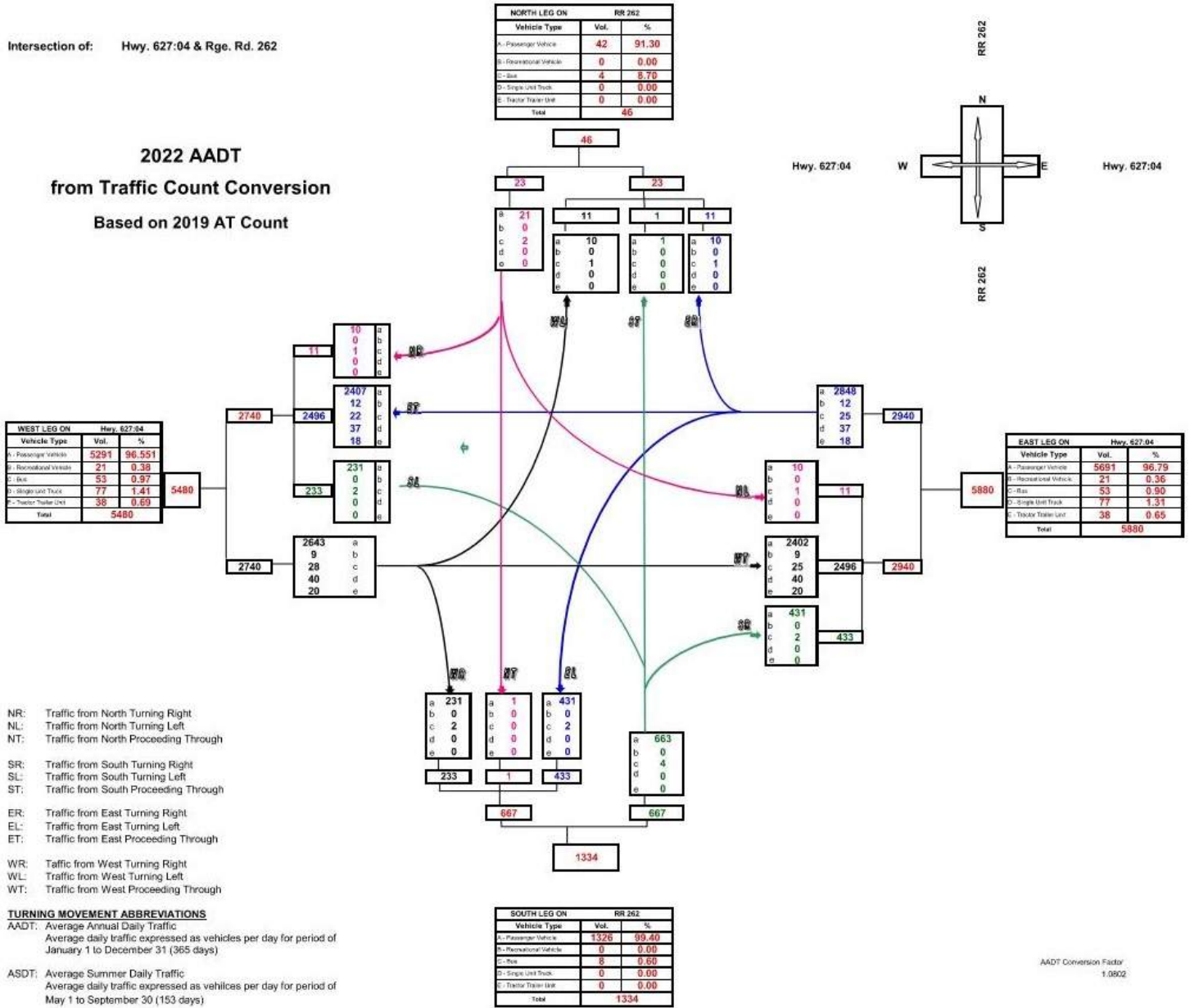
Using the above projections, the following turning movement diagram for 2022 is estimated for Hwy. 627:04 & Rge. Rd. 262 intersection:



Turning Movement Summary Diagram

Intersection of: Hwy. 627:04 & Rge. Rd. 262

2022 AADT
from Traffic Count Conversion
Based on 2019 AT Count

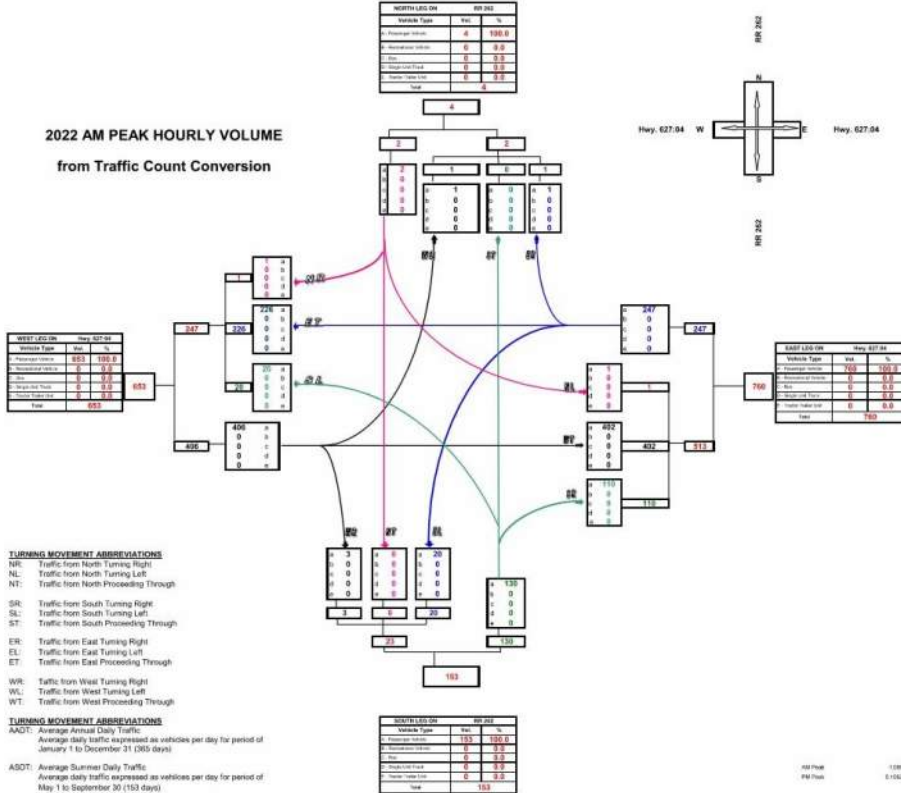


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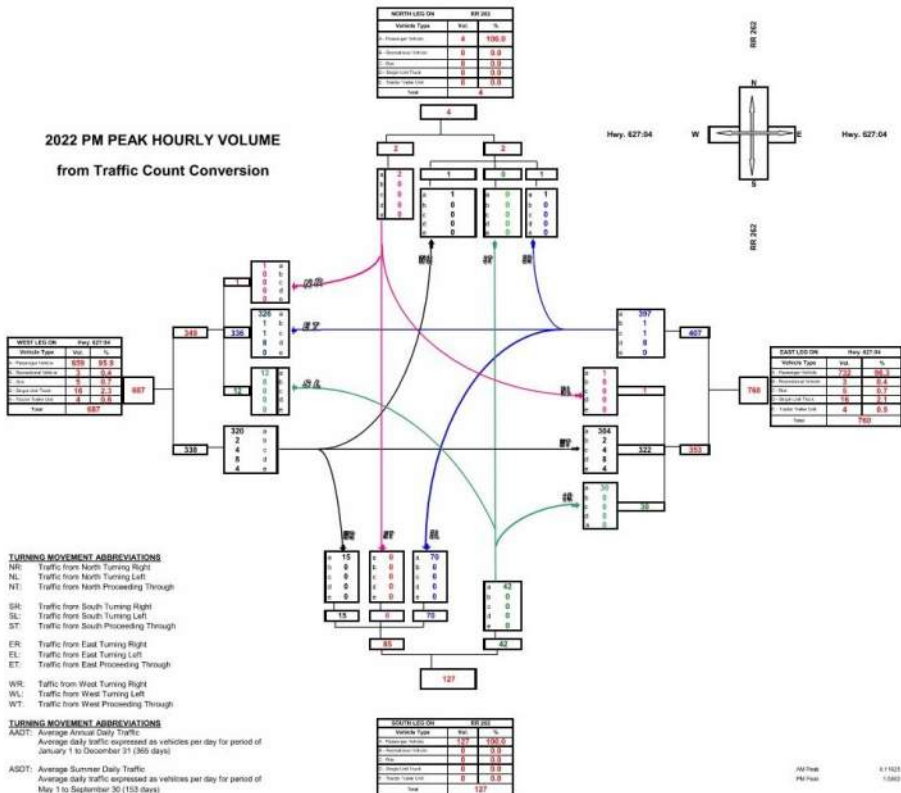
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Turning Movement Summary Diagram



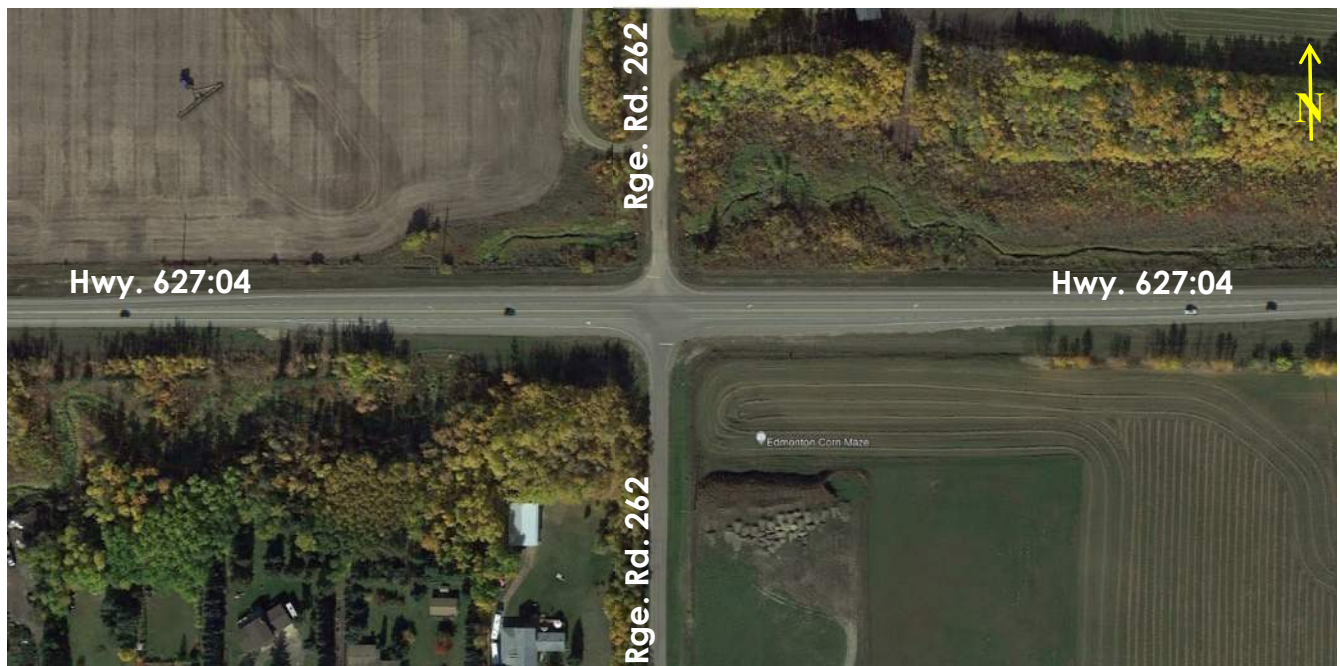
Turning Movement Summary Diagram



3.3 Site Observations

The details of the intersection site are as follows:

- Highway 627:04 is a two-laned roadway and is paved.
- The intersection has an existing treatment as follows:
 - EBL's
 - An approximate 87.5m taper and 75m right turn deceleration lane exists for EB to SB turns.
 - An approximate 77m right turn acceleration lane and 91m taper exists for NB to EB turns.
 - WBL's
 - An approximate 120m taper and 190m left turn deceleration lane exists for WB to SB left turns. A by-pass lane is to the north.
 - An approximate 60m right turn acceleration lane and 200m taper exists for NB to WB turns.
 - Overall, the existing treatment is near a Type IVb intersection treatment with just some differences between taper and lane lengths however the total being within or exceeding requirements.
- Vehicles on Highway 627 appeared to be traveling at the posted speed limit of 100 km/hr.
- The side slopes seem to be 4:1 or better throughout.
- There is no existing illumination at this location.
- Intersectional sight distance from Rge. Rd. 262 onto Hwy. 627:04 is greater than 450m in both east and west directions.



TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)



Viewing East, on Hwy. 627 EBL, just west of the intersection with Rge. Rd. 262.



Viewing East, on Hwy. 627 EBL, just west of the intersection with Rge. Rd. 262.

TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)



Viewing South, on Hwy. 627 towards Rge. Rd. 262 South.



Viewing West, on Hwy. 627 EBL, just east of the intersection with Rge. Rd. 262.

3.4 Highway Traffic Projections – 627:04

The following historical traffic data for Highway 627:04 is available from the Alberta Transportation's website indicates a growth rate of 4.06% for the east leg of the Hwy. 60:02 and Hwy. 627:04 intersection from 1989 to 2019 (30 years), 2.76% growth from 1999 to 2019 (20 years), 2.44% growth from 2004 to 2019 (15 years), 3.79% from 2009 to 2019 (10 years) and 4.38% from 2014 to 2019 (5 years). The average of these 5 rates is 3.49%. The growth rate from 1989 to 2022 (33 years) is 1.54%.

Historical Traffic Volumes – Hwy. 627:04

Year	2015	2016	2017	2018	2019	2020	2021	2022
AADT	4860	5700	5640	5640	5680	4920	3940	3860

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AADT	3950	4160	4440	4600	4080	4080	4120	4620	4700	4560	4620	4660

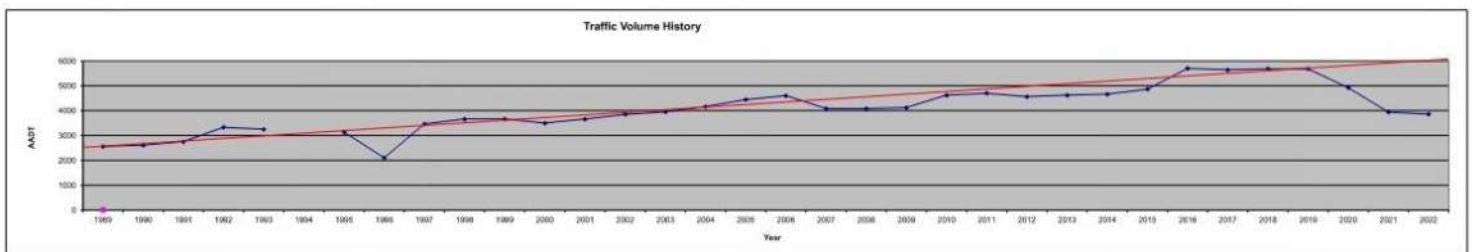
Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
AADT	2560	2610	2750	3330	3250		3140	2110	3460	3660	3660	3500	3660	3850



TRAFFIC VOLUME HISTORY & GROWTH RATES

Highway 627:04

TRAFFIC VOLUME HISTORY																																				
Location	AADT 1989	AADT 1990	AADT 1991	AADT 1992	AADT 1993	AADT 1994	AADT 1995	AADT 1996	AADT 1997	AADT 1998	AADT 1999	AADT 2000	AADT 2001	AADT 2002	AADT 2003	AADT 2004	AADT 2005	AADT 2006	AADT 2007	AADT 2008	AADT 2009	AADT 2010	AADT 2011	AADT 2012	AADT 2013	AADT 2014	AADT 2015	AADT 2016	AADT 2017	AADT 2018	AADT 2019	AADT 2020	AADT 2021	AADT 2022	Growth Rate	
Highway 627:04, E. of Hwy. 60	2560	2610	2750	3330	3250		3140	2110	3460	3660	3660	3500	3660	3850	3950	4160	4440	4600	4080	4080	4120	4620	4700	4560	4620	4660	4920	5700	5640	5680	5680	4920	3940	3860	1.54%	
Highway 627:04																																				Use Growth Rate: 3.50%
Rge. Rd. 262																																				Use Growth Rate: 2.00%



For analysis purposes, a growth rate of 3.5% non-compounded annually will be used for Hwy. 627:04 for the next 20 years, which is approximately the average of the five rates above using data from 1989 to 2019.

A growth rate of 2.0% will be used for Range Road 262.

Projected AADT values for Hwy. 627:04 are presented in the table below for key times:

Existing Highway Traffic Forecast, Daily Volumes

Year	Hwy. 627:04 West Leg	Hwy. 627:04 East Leg	Rge. Rd. 262 South Leg
2019	5848	6264	1386
2029 (10 Year)	7692	8188	1650
2039 (20 Year)	9537	10113	1922

Peak hour traffic loading (100th highest hour) is shown below for am/pm volumes:

Existing Highway Traffic Forecast, Peak Hour Volumes

Year	Hwy. 627:04 West Leg a.m. & p.m.	Hwy. 627:04 East Leg a.m. & p.m.	Rge. Rd. 262 South Leg a.m. & p.m.
2019	698 / 729	809 / 809	159 / 131
2029 (10 Year)	923 / 1055	970 / 1060	190 / 158
2039 (20 Year)	1147 / 1206	1301 / 1311	220 / 183

The following tables show the estimated combined traffic volumes at the Highway 627:04 and Rge. Rd. 262 intersection.

Combined Highway Traffic Forecast, Daily Volumes

Year	Hwy. 627:04 West Leg	Hwy. 627:04 East Leg	Rge. Rd. 262 South Leg
2024	5862	6310	1446
2034 (10 Year)	7706	8234	1710
2044 (20 Year)	9551	10159	1982

Peak hour traffic loading (100th highest hour) is shown below for am/pm volumes:

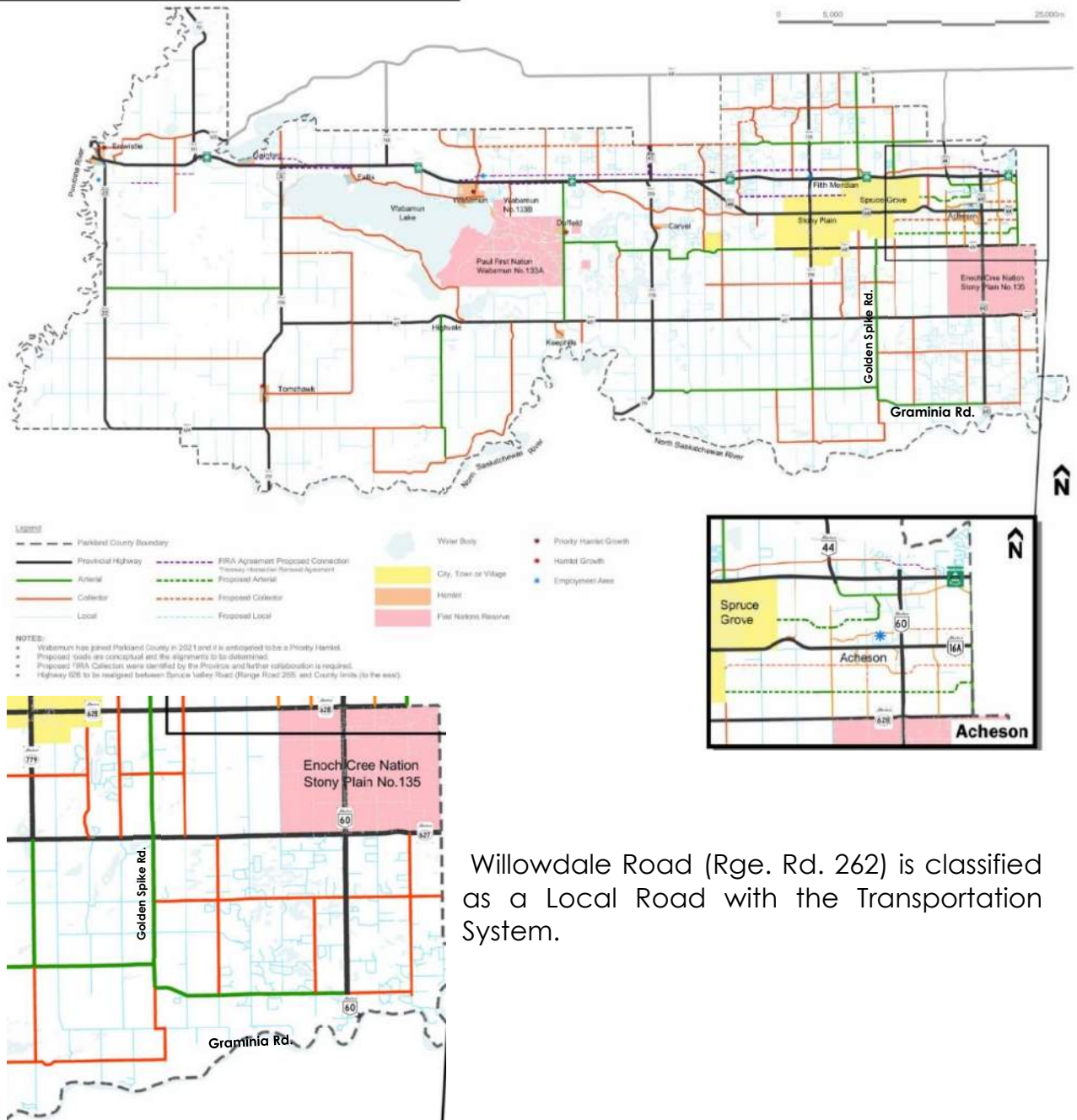
Combined Highway Traffic Forecast, Peak Hour Volumes

Year	Hwy. 627:04 West Leg a.m. & p.m.	Hwy. 627:04 East Leg a.m. & p.m.	Rge. Rd. 262 South Leg a.m. & p.m.
2024	698 / 732	809 / 809	159 / 131
2034 (10 Year)	923 / 1055	970 / 1060	190 / 158
2044 (20 Year)	1147 / 1206	1301 / 1311	220 / 183

3.5 Physical Properties – Willowdale Road (Range Road 262)

Willowdale Road (Rge. Rd. 262) traverses from Hwy. 627 and continues to the south for 5.0 km where it terminates as a dead end.

FIGURE 17 | PROPOSED MAIN ROAD NETWORK



Willowdale Road (Rge. Rd. 262) is classified as a Local Road with the Transportation System.

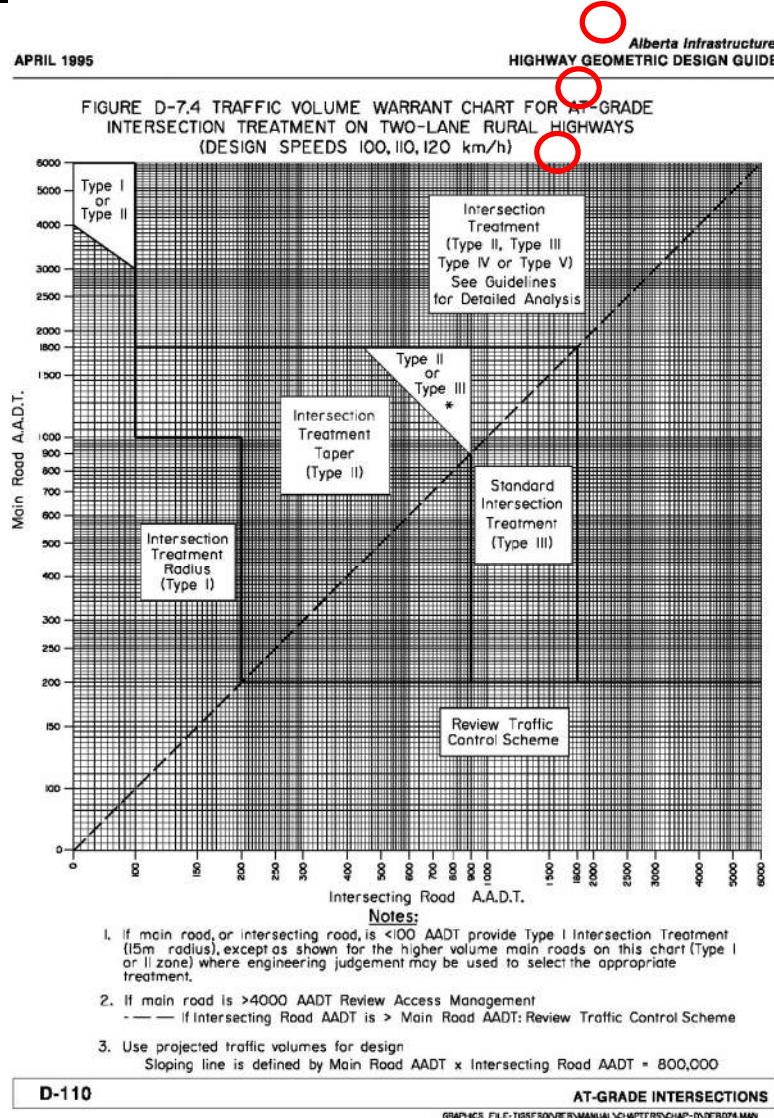
4. TRAFFIC ANALYSIS – HIGHWAY 627:04 & RGE. RD. 262

4.1 Design Speed

The posted speed on Highway 627:04 at this location is 100 km/hr. It is therefore reasonable to conclude that a design speed of 110 km/h is suitable.

4.2 Detailed Analysis

Using the 2024, 2034 and 2044 AADT values for the Highway 627:04 & Rge. Rd. 262 intersection indicate from referencing Figure D-7.4, "Traffic Volume Warrant Chart for At-Grade Intersection Treatment on Two-Lane Rural Highways (Design Speeds 100/110/120 km/h)", that a **Type II, III or IV intersection may be warranted pending a detailed analysis.**



TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

Using the Alberta Transportation Warrant Spreadsheet, version 2 (Jan. 2020), confirms that a Type IV intersection would be warranted for the junction of Highway 627:04 and Range Road 262 in 2034 and 2044. See below.

**Alberta Transportation
 Intersection Analysis
 Two-Lane Undivided Highways**

Main Rd: Highway 627:04
 Minor Rd: Rge. Rd. 262

Direction: EB
 Period: AM Peak

Year of Analysis: 2034
 Date of Analysis: 10-Nov-2023

INPUT	Value
85 th percentile speed, km/h:	100
Main Road A.A.D.T.	8,234
Minor (intersecting) Road A.A.D.T	1,710
Left turn volume (V_{LT}), veh/h:	25
Advancing volume (V_{adv}), veh/h:	347
Opposing volume (V_{opp}), veh/h:	576
Left turn truck volume, trucks/h:	3
Right turn volume (V_{RT}), veh/day:	295

OUTPUT	Value
Percent left-turns in advancing volume:	7.2%
Percent trucks in left turn volume:	12.0%
Probability of conflict threshold:	0.89%
Calculated probability of conflicting arrival:	2.0%
Calculated conflicts per hour, veh/h:	6.9

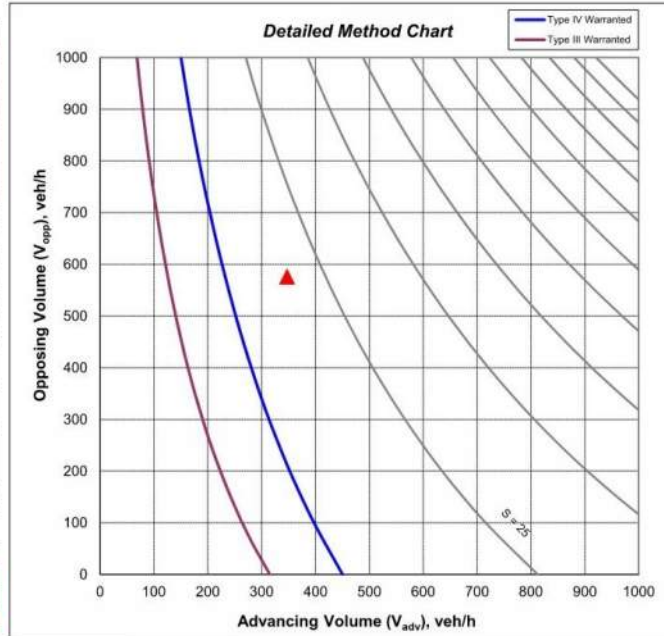
Use Detailed Method

Type IV

Additional Storage Not Required	base storage requirement	-
	- standard storage length	-
	+ additional truck storage	-
	= total additional storage required	-

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway (gap), s:	5.0
Average time to clear, s:	1.9



In 2034 in the AM Peak Hour, a Type IV intersection treatment is warranted with no additional storage needed for the left turns from WB to SB.

**Alberta Transportation
 Intersection Analysis
 Two-Lane Undivided Highways**

Main Rd: Highway 627:04
 Minor Rd: Rge. Rd. 262

Direction: EB
 Period: PM Peak

Year of Analysis: 2034
 Date of Analysis: 10-Nov-2023

INPUT	Value
85 th percentile speed, km/h:	100
Main Road A.A.D.T.	8,234
Minor (intersecting) Road A.A.D.T	1,710
Left turn volume (V_{LT}), veh/h:	87
Advancing volume (V_{adv}), veh/h:	564
Opposing volume (V_{opp}), veh/h:	478
Left turn truck volume, trucks/h:	8
Right turn volume (V_{RT}), veh/day:	295

OUTPUT	Value
Percent left-turns in advancing volume:	15.4%
Percent trucks in left turn volume:	9.2%
Probability of conflict threshold:	0.89%
Calculated probability of conflicting arrival:	8.4%
Calculated conflicts per hour, veh/h:	47.1

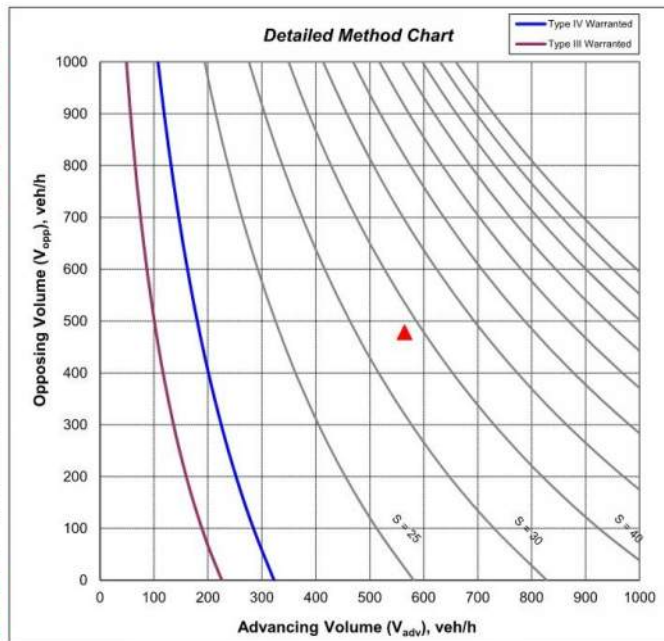
Use Detailed Method

Type IV

Additional Storage Required	base storage requirement	30 m
	- standard storage length	20 m
	+ additional truck storage	0 m
	= total additional storage required	10 m

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway (gap), s:	5.0
Average time to clear, s:	1.9



TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

In 2034 in the PM Peak Hour, a Type IV intersection treatment is warranted with 10m of additional storage is needed for the left turns from WB to SB.

Alberta Transportation
Intersection Analysis
Two-Lane Undivided Highways

Main Rd: Highway 627:04
 Minor Rd: Rge. Rd. 262

Direction: EB
 Period: AM Peak

Year of Analysis: 2044
 Date of Analysis: 10-Nov-2023

INPUT		Value
85 th percentile speed, km/h:		100
Main Road A.A.D.T.		10,113
Minor (intersecting) Road A.A.D.T		1,922
Left turn volume (V_{LT}), veh/h:		29
Advancing volume (V_{adv}), veh/h:		430
Opposing volume (V_{opp}), veh/h:		717
Left turn truck volume, trucks/h:		5
Right turn volume (V_{RT}), veh/day:		343

OUTPUT		Value
Percent left-turns in advancing volume:		6.7%
Percent trucks in left turn volume:		17.2%
Probability of conflict threshold:		0.89%
Calculated probability of conflicting arrival:		3.9%
Calculated conflicts per hour, veh/h:		16.7

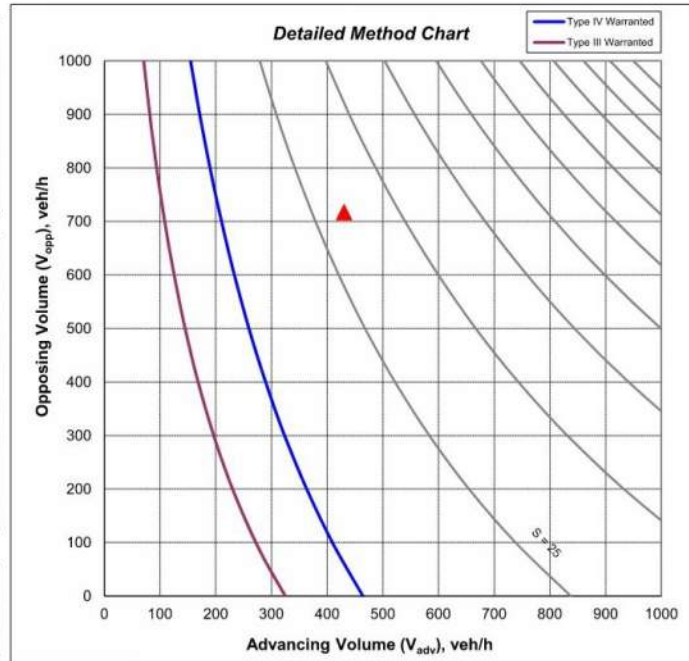
Use Detailed Method

Type IV

Additional Storage Required	base storage requirement	25 m
	- standard storage length	20 m
	+ additional truck storage	0 m
	= total additional storage required	5 m

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway (gap), s:	5.0
Average time to clear, s:	1.9



In 2044 in the AM Peak Hour, a Type IV intersection treatment is warranted with 5m of additional storage is needed for the left turns from WB to SB.

Alberta Transportation
Intersection Analysis
Two-Lane Undivided Highways

Main Rd: Highway 627:04
 Minor Rd: Rge. Rd. 262

Direction: EB
 Period: PM Peak

Year of Analysis: 2044
 Date of Analysis: 10-Nov-2023

INPUT		Value
85 th percentile speed, km/h:		100
Main Road A.A.D.T.		10,113
Minor (intersecting) Road A.A.D.T		1,922
Left turn volume (V_{LT}), veh/h:		101
Advancing volume (V_{adv}), veh/h:		697
Opposing volume (V_{opp}), veh/h:		593
Left turn truck volume, trucks/h:		10
Right turn volume (V_{RT}), veh/day:		343

OUTPUT		Value
Percent left-turns in advancing volume:		14.5%
Percent trucks in left turn volume:		9.9%
Probability of conflict threshold:		0.89%
Calculated probability of conflicting arrival:		15.5%
Calculated conflicts per hour, veh/h:		107.9

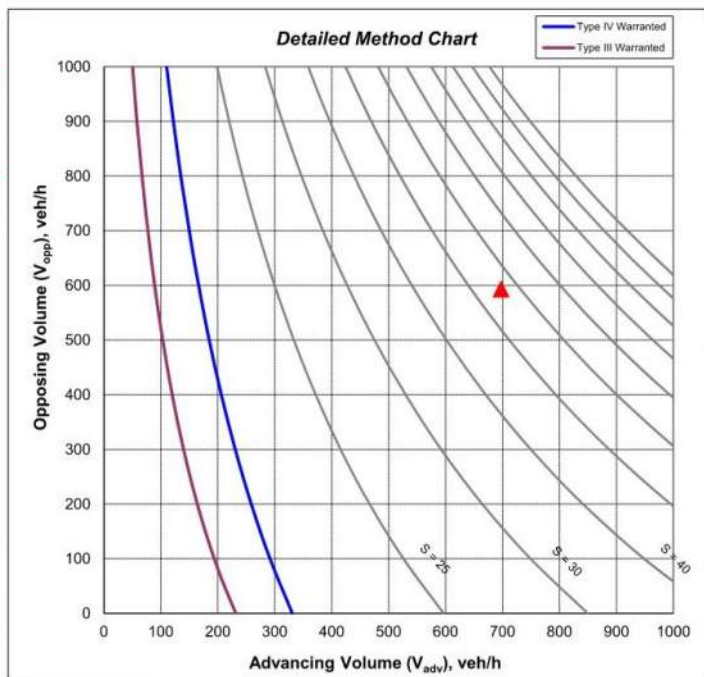
Use Detailed Method

Type IV

Additional Storage Required	base storage requirement	50 m
	- standard storage length	20 m
	+ additional truck storage	0 m
	= total additional storage required	30 m

CALIBRATION CONSTANTS

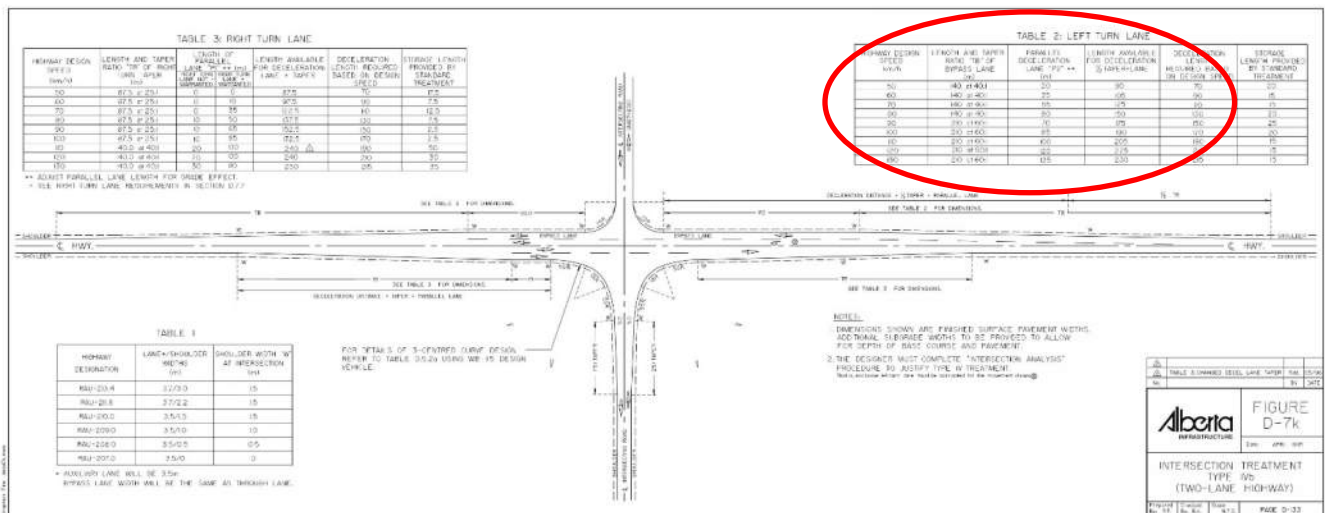
Variable	Value
Average time for making left-turn, s:	3.0
Critical headway (gap), s:	5.0
Average time to clear, s:	1.9



TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

In 2044 in the PM Peak Hour, a Type IV intersection treatment is warranted with 30m of additional storage is needed for the left turns from WB to SB. The existing intersection contains a 120m taper and 190m left turn deceleration lane (total of 310m) for WB to SB left turns as shown below.



SUMMARY

The requirement for left turns with a Type IVb intersection treatment is 100m for a deceleration lane and 210m for a deceleration taper. Since the existing deceleration lane is 190m and the taper is 120m, the existing treatment meets this requirement.

For 2034, the PM Peak Hour warrants an additional 10m of storage and the 2044 PM Peak Hour warrants an additional 30m of storage.

Since the proposed development is not projected to add any additional traffic during the AM Peak Hour or the PM Peak Hour of traffic, this development does not trigger these improvements (additional left turn storage) being made in the future. The left turn capacity for WB to SB traffic is sufficient for the next 20 years during the off-peak hours and evening hours when the addition to the church site is to be mainly used. Therefore, no improvements are recommended.

4.3 Intersectional Sight Distance

In accordance with section D.4, "Sight Distances at Intersections", the sight distance for left turning vehicles from the approach, without interfering with vehicles nearing the intersection, is used for determination of minimum sight distance requirements. Using Fig. D-4.2.2.2, shown in Appendix C, the required sight distances for various vehicle types with a 90 km/hr design speed are as follows:

Vehicle Type	Required Sight Distance – 110 km/hr.
Passenger Vehicle (P)	212 m
Single Unit or Bus (SU)	325 m
Semi-Trailer Combination (WB15)	427 m
Semi-Trailer Combination (WB21, WB23, WB28, WB33)	561 m

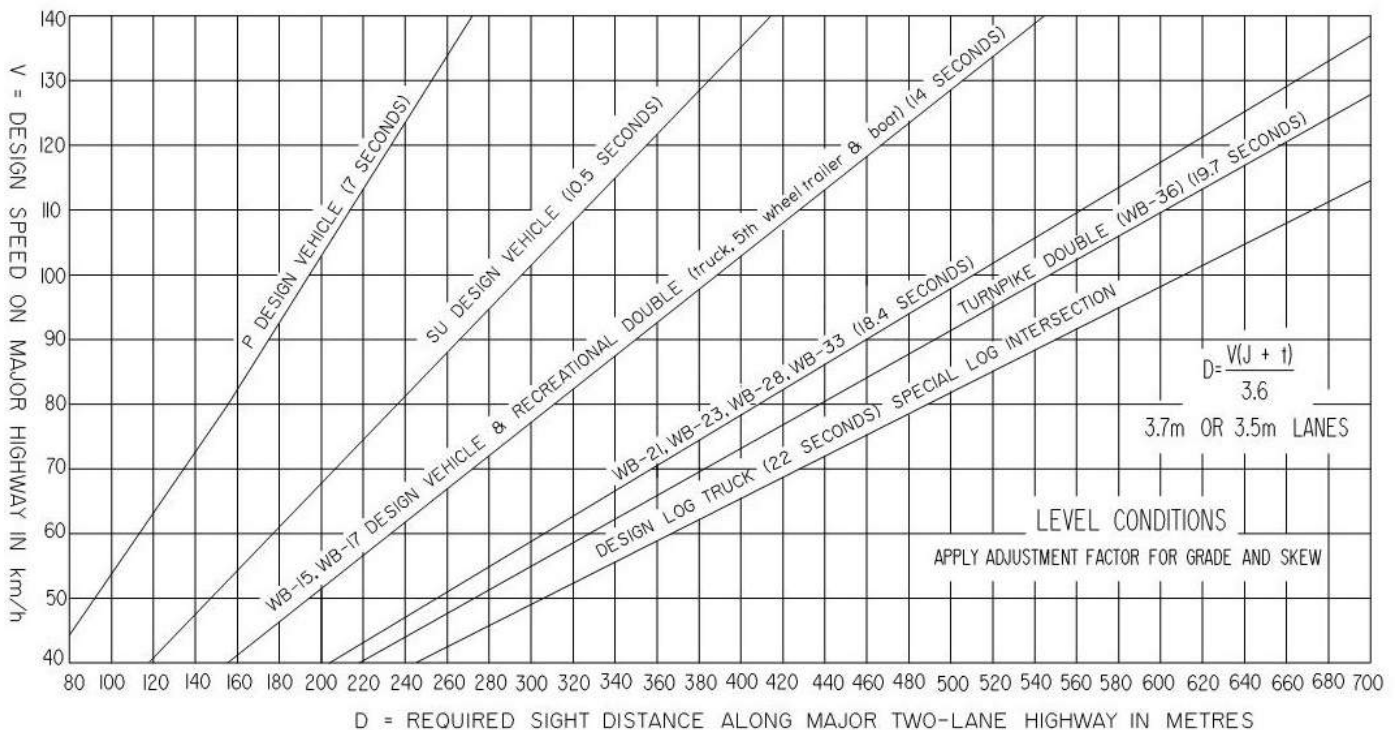


FIGURE D-4.1a SIGHT TRIANGLE (HORIZONTAL PLANE)

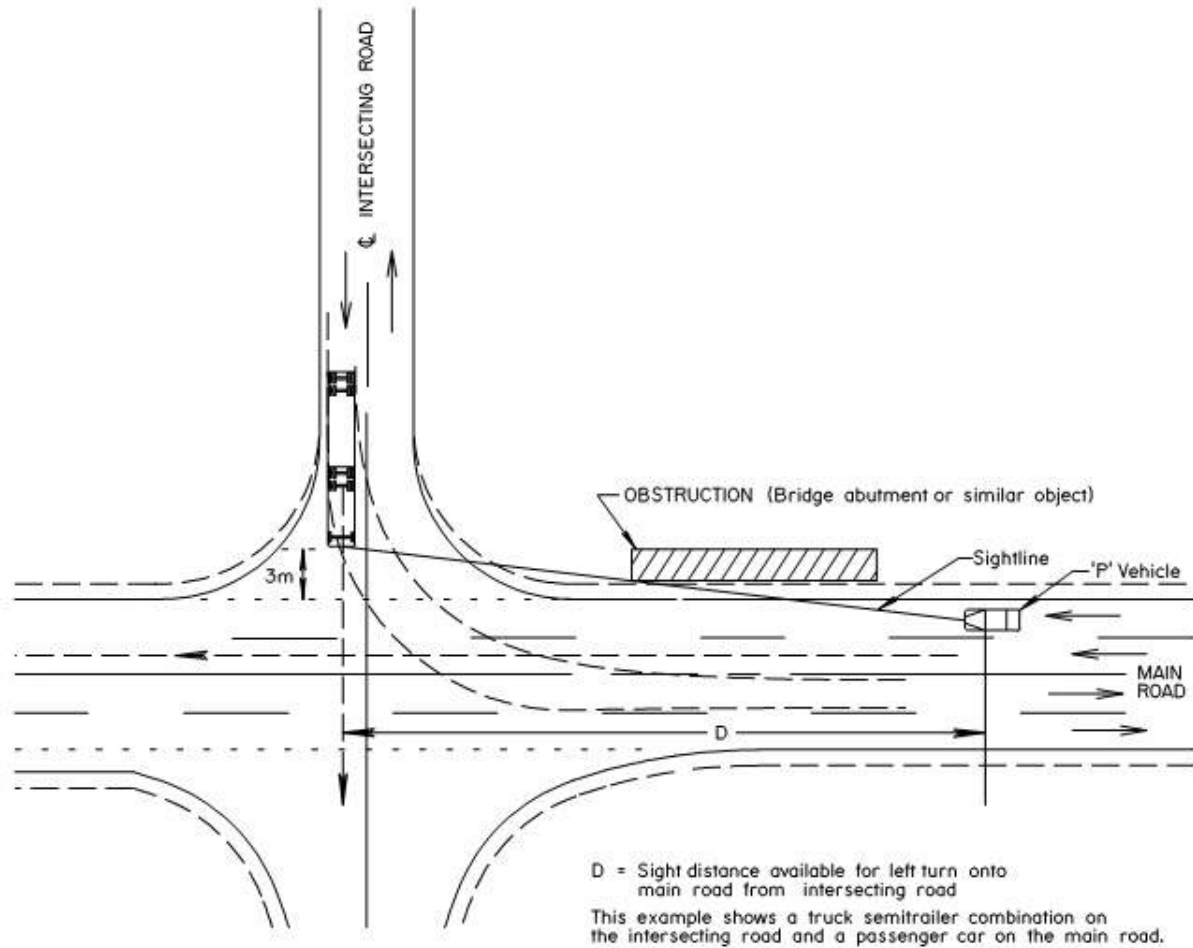
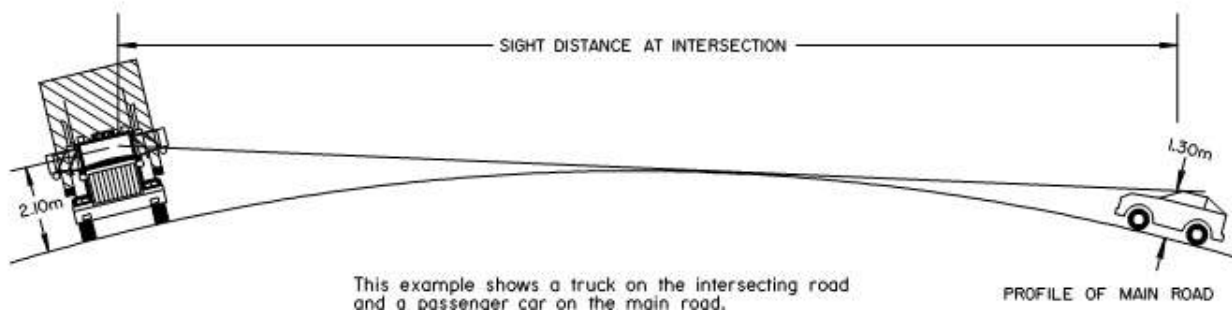


FIGURE D-4.1b SIGHT LINE (VERTICAL PLANE)



As per the site inspection notes, the intersectional sight distance available at both intersections in both directions is greater than 450m which exceeds the required

intersectional sight distance of 350m for a WB-15 design vehicle. Larger vehicles are not anticipated to use these intersections.

4.4 Illumination & Signalization Warrants

Illumination is not warranted at the intersection of Highway 627:04 and Range Road 262 presently and for the next 20 years upon calculation of the illumination warrant.

Location	Year	Illumination Warrant Score	Illumination Warrant Met? (Min. 120)	Signalization Warrant Score	Signalization Warrant Met?
Highway 627:04 & Rge. Rd. 262	2024	121 Delineation Lighting Only	Traffic Volumes Too Low		Traffic Volumes Too Low
Highway 627:04 & Rge. Rd. 262	2034	141 Delineation Lighting Only	Traffic Volumes Too Low		Traffic Volumes Too Low
Highway 627:04 & Rge. Rd. 262	2044	141 Delineation Lighting Only	Traffic Volumes Too Low	1	Traffic Volumes Too Low

The illumination analysis indicates for all three time milestones that “Illumination Warranted Delineation Lighting to Illuminate Pedestrians or Cross Street Traffic”. It is important to note that neither pedestrians are using or projected to use this rural intersection on the highway or any significant cross traffic is occurring. Also, the traffic turning movement diagrams projects only 1 cross movement per day in each direction on Range Road 262 since the north leg of intersection is within the Enoch First Nations. This is very minimal and would likely occur during daylight. Therefore, illumination is not recommended for this intersection for the next 20 years for these reasons.

TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

Illumination of Isolated Rural Intersections LIGHTING WARRANT SPREADSHEET

This spreadsheet is to be used in conjunction with *Illumination of Isolated Rural Intersections*, Transportation Association of Canada, February 2001.

Please enter information in the cells with yellow background

INTERSECTION CHARACTERISTICS

Hwy. 627:04	Main Road
Rge. Rd. 262	Minor Road
	City/Town

Date	Nov. 10, 2023
Other	YEAR 2044

GEOMETRIC FACTORS

	Value	Rating	Weight	Comments	Check	Score
Channelization Rating	n	0		Refer to Table 1(A) to determine rating value	OK	
Presence of raised channelization? (Y/N)	n				OK	
Highest operating speed on raised, channelized approach (km/h)	50		5		OK	
Channelization Factor					OK	0
Approach Sight Distance on most constrained approach (%)	100	0	10	Relative to the recommended minimum sight distance	OK	0
Posted Speed limit (in 10's of km/h)	100				OK	
Radius of Horizontal Curve (m)	T			Enter "T" for tangent (no horizontal curve at the intersection)	OK	
Posted Speed Category =		0				
Posted Speed Category =	B	0				
Posted Speed Category =		0				
Posted Speed Category =		0				
Horizontal Curvature Factor		0	5		OK	0
Angle of Intersection (10's of Degrees)	90	0	5		OK	0
Downhill Approach Grade (x,x%)	0.0	0	3	Rounded to nearest tenth of a percent	OK	0
Number of Intersection Legs	4	2	3	Number of legs = 3 or more	OK	6
Geometric Factors Subtotal						6

OPERATIONAL FACTORS

Is the intersection signalized? (Y/N)	n			Calculate the Signalization Warrant Factor		
AADT on Major Road (2-way)	10159	4	10		OK	40
AADT on Minor Road (2-way)	1982	3	20	Either Use the two AADT inputs OR the Descriptive Signalization Warrant (Unused values should be set to Zero) Refer to Table 1(B) for description and rating values for signalization warrant.	OK	60
Signalization Warrant	Descriptive	0	30		OK	0
Night-Time Hourly Pedestrian Volume	0	0	10	Refer to Table 1(B), note #2, to account for children and seniors	OK	0
Intersecting Roadway Classification	Descriptive	0	5	Refer to Table 1(B) for ratings.	OK	0
Operating Speed or Posted Speed on Major Road (km/h)	100	4	5	Refer to Table 1(B), note #3	OK	20
Operating Speed on Minor Road (km/h)	80	3	5	Refer to Table 1(B), note #3	OK	15
Operational Factors Subtotal						135

ENVIRONMENTAL FACTOR

Lighted Developments within 150 m radius of intersection	0	0	5	Maximum of 4 quadrants	OK	0
Environmental Factor Subtotal						0

COLLISION HISTORY

Average Annual night-time collision frequency due to inadequate lighting (collisions/yr, rounded to nearest whole #)	0.0	0	0	Enter either the annual frequency (See Table 1(C), note #4)	OK	0
OR				OR the number of collisions / MEV	OK	0
Collision Rate over last 3 years, due to inadequate lighting (/MEV)	0	0	0	(Unused values should be set to Zero)	OK	0
Is the average ratio of all night to day collisions >= 1.5 (Y/N)	n	0			OK	
Collision History Subtotal						0

Check Intersection Signalization:
Intersection is not Signalized

ILLUMINATION WARRANTED
 DELINEATION LIGHTING TO ILLUMINATE PEDESTRIANS OR
 CROSS STREET TRAFFIC

SUMMARY

Geometric Factors Subtotal	6
Operational Factor Subtotal	135
Environmental Factor Subtotal	0
Collision History Subtotal	0
TOTAL POINTS	141

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TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M

Parkland County

Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

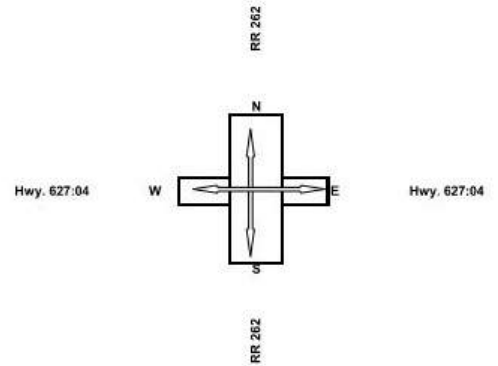


Turning Movement Summary Diagram

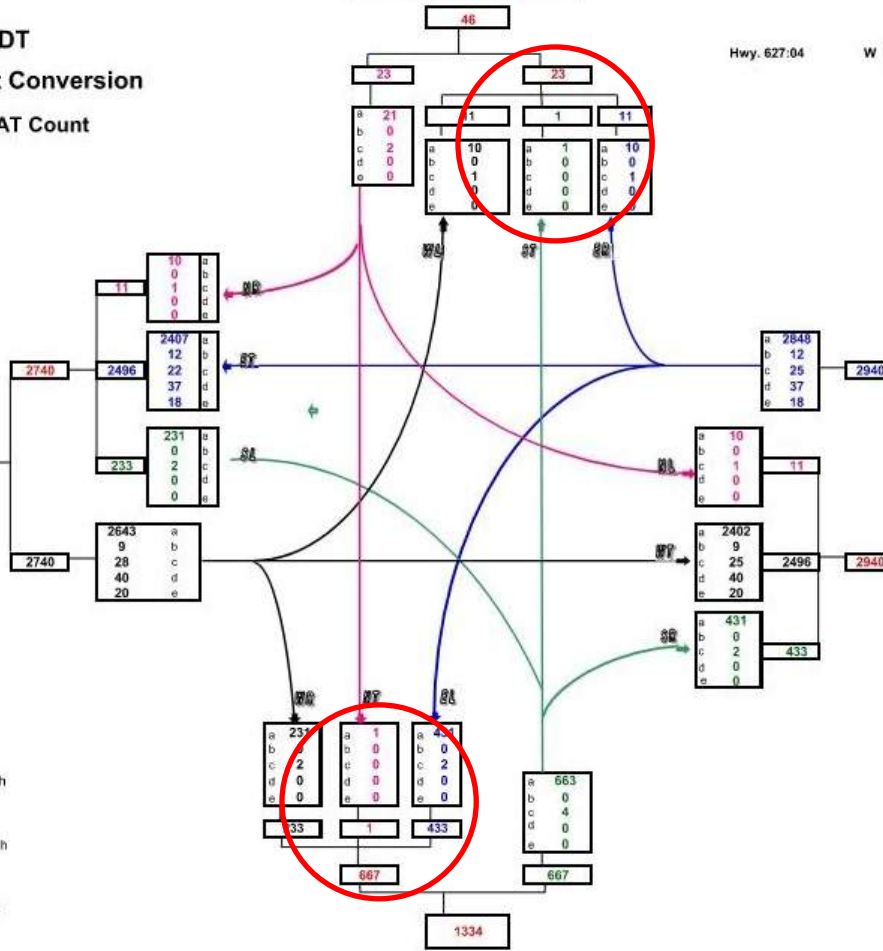
Intersection of: Hwy. 627:04 & Rge. Rd. 262

2022 AADT
from Traffic Count Conversion
Based on 2019 AT Count

NORTH LEG ON RR 262		
Vehicle Type	Vol.	%
A- Passenger Vehicle	42	91.30
B- Recreational Vehicle	0	0.00
C- Bus	4	8.70
D- Single Unit Truck	0	0.00
E- Tractor Trailer Unit	0	0.00
Total	46	



WEST LEG ON Hwy. 627:04		
Vehicle Type	Vol.	%
A- Passenger Vehicle	5291	96.551
B- Recreational Vehicle	21	0.36
C- Bus	53	0.97
D- Single Unit Truck	77	1.41
E- Tractor Trailer Unit	36	0.69
Total	5480	



EAST LEG ON Hwy. 627:04		
Vehicle Type	Vol.	%
A- Passenger Vehicle	5691	96.79
B- Recreational Vehicle	21	0.36
C- Bus	53	0.90
D- Single Unit Truck	77	1.31
E- Tractor Trailer Unit	38	0.65
Total	5880	

- NR: Traffic from North Turning Right
- NL: Traffic from North Turning Left
- NT: Traffic from North Proceeding Through
- SR: Traffic from South Turning Right
- SL: Traffic from South Turning Left
- ST: Traffic from South Proceeding Through
- ER: Traffic from East Turning Right
- EL: Traffic from East Turning Left
- ET: Traffic from East Proceeding Through
- WR: Traffic from West Turning Right
- WL: Traffic from West Turning Left
- WT: Traffic from West Proceeding Through

TURNING MOVEMENT ABBREVIATIONS

AADT: Average Annual Daily Traffic
Average daily traffic expressed as vehicles per day for period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic
Average daily traffic expressed as vehicles per day for period of May 1 to September 30 (153 days)

SOUTH LEG ON RR 262		
Vehicle Type	Vol.	%
A- Passenger Vehicle	1326	99.40
B- Recreational Vehicle	0	0.00
C- Bus	8	0.60
D- Single Unit Truck	0	0.00
E- Tractor Trailer Unit	0	0.00
Total	1334	

AADT Conversion Factor
1.0802

TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

Signalization is not warranted at the intersection for the next 20 years.

2005 Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 627:04	Direction (EW or NS)	EW	Date:	Nov 10, 2023
Side Street (name)	Rge. Rd. 262	Direction (EW or NS)	NW	City:	Rural
Quadrant (if appl)	Year 2044				

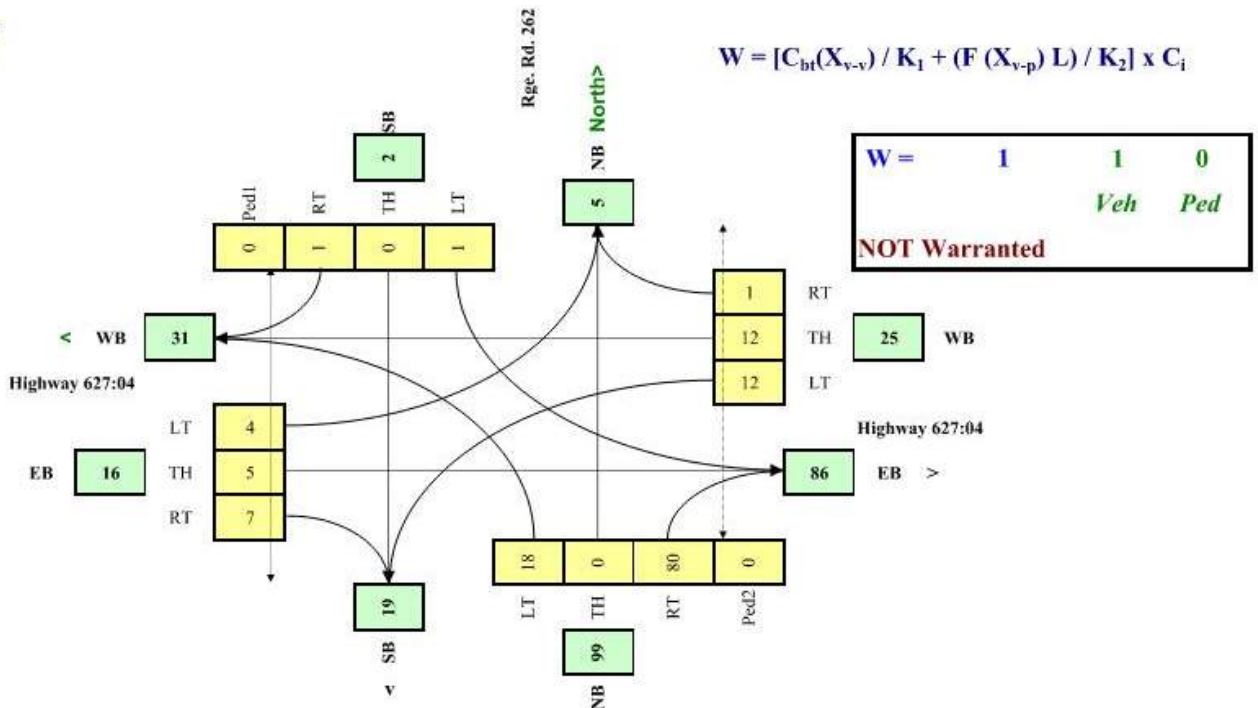
Lane Configuration		Excl LT	Th & LT	Through or Th-RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Hwy. 627:04	WB	1	0	0	1	0	0	1
Hwy. 627:04	EB	0	1	0	0	1	0	1
Rge. Rd. 262	NB	0	0	1	0	0		
Rge. Rd. 262	SB	0	0	1	0	0		

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	n
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Highway 627:04	EW	100	10.0%	y	0.0
Rge. Rd. 262	NW	80	5.0%	y	

Traffic Input	NB			SB			WB			EB			Ped1	Ped2	Ped3	Ped4
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	NS	NS	EW	EW
7:30 - 8:30	29	0	158	1	0	1	29	400	1	1	712	4	0	0	0	0
8:30 - 9:30	26	0	142	1	0	1	26	360	1	1	641	4	0	0	0	0
11:30 - 12:30	15	0	79	1	0	1	15	200	1	1	356	2	0	0	0	0
12:30 - 13:30	9	0	22	1	0	1	51	298	1	1	285	11	0	0	0	0
16:00 - 17:00	15	0	39	1	0	1	91	536	1	1	513	20	0	0	0	0
17:00 - 18:00	17	0	43	1	0	1	101	595	1	1	570	22	0	0	0	0
Total (6-hour peak)	110	0	482	5	0	5	71	69	8	24	27	42	0	0	0	0
Average (6-hour peak)	18	0	80	1	0	1	12	12	1	4	5	7	0	0	0	0

Average 6-hour Peak Turning Movements



4.5 Capacity Analysis

The capacity analysis was performed for the intersection for the 100th highest hour for the AM Peak and PM Peak for Years 2044. The traffic analysis was completed using Synchro 10 software based on HCM 2000 methodology. A saturation flow of 1700 vpl was used in this analysis. See the tables below for the results.

WITH DEVELOPMENT

YEAR		Highway 627:04		Rge. Rd. 262	
TIME PERIOD	PARAMETERS	EB All Turns	WB All Turns	SB All Turns	
Year 2034	AM Peak	LOS	A	A	C
		Delay (s)	0.0	8.9	20.8
		v/c Ratio	0.0	0.21	0.44
		Queue Length (m)	0.0	0.7	17.3
	PM Peak	LOS	A	A	C
		Delay (s)	0.0	8.8	19.0
		v/c Ratio	0.01	0.30	0.18
		Queue Length (m)	0.0	2.4	5.1
Year 2044	AM Peak	LOS	A	A	E
		Delay (s)	0.0	9.5	37.6
		v/c Ratio	0.0	0.26	0.67
		Queue Length (m)	0.0	1.0	35.7
	PM Peak	LOS	A	A	D
		Delay (s)	0.0	9.4	27.9
		v/c Ratio	0.01	0.38	0.29
		Queue Length (m)	0.0	3.2	9.4

The results indicate that a Level of Service (LOS) of A is maintained for eastbound traffic on Highway 627:04 for the next 20 years. This confirms that left turns into Rge. Rd. 262 does not impact through traffic going eastbound on Highway 627:04. For left turns out of Rge. Rd. 262, the Level of Service (LOS) drops only to D and E in 2044. This is where the intersection may be approaching the requirement for traffic signals and should be reviewed at this time. Again, since the development is not projected to add any traffic during the peak hours of traffic, improvements to the intersection are not recommended for the approval of this project and the development does not

TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M

Parkland County

Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

add any additional traffic during the peak hours of traffic flow to make the Level of Service worse any quicker.



TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
 LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M

Parkland County

Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)

Control Delay Per Vehicle (s)	LOS by Volume to Capacity Ratio	
	≤1	>1
≤10	A	F
>10 and ≤15	B	F
>15 and ≤25	C	F
>25 and ≤35	D	F
>35 and ≤50	E	F
>50	F	F



Level of Service "A"



Level of Service "B"



Level of Service "C"



Level of Service "D"



Level of Service "E"



Level of Service "F"

5. LOCAL ROADWAY ASSESSMENTS

5.1 Assessment Scope

This section will review the local roadways of Range Road 262, for accessing the proposed development.

5.2 Posted Speed

Posted speed is assumed to be 80 km/h for these routes with a design speed of 90 km/h.

5.3 Roadway Standards

The local roads that the development will use are within Parkland County.

It is important to note that the following standards are mainly for new development and do not differentiate between development of a new road versus upgrading/rehabilitating an existing road. Most of the local roads in Alberta were built many years ago and likely followed a lower set of standards than is used today. Therefore, there must be some engineering judgement used in regards to which parameters of the standards can be allowed some flexibility when applying them to these existing roads. Other jurisdictions such as Alberta Transportation provide allowances for rehabilitation of existing roadways with some flexibility towards the roadway standards. These standards are known as the 3R/4R Geometric Design Guidelines. The purpose of these guidelines is "to extend the service life of existing paved highways and enhance highway safety on a network basis. To accomplish this objective, the standards focus on the most safety-cost effective improvements and also encourage the use of low-cost opportunities to improve safety where major reconstruction is not cost-effective".

Parkland County provides a section for Roadway Systems in their "Engineering Design Standards", dated/amended June 2014. These standards are noted to be used for roadways for new subdivision development within Parkland County. The roadway standards for various road classifications are shown below.

Range Road 262 is classified as a "Local Road" as they contain a low volume of traffic. The County's standards define the function of a Local Road "to provide access to adjacent properties carrying traffic from higher order roads to individual land parcels. Local roads are typically low speed and low volume roadways. They connect to other local roadways or collectors."

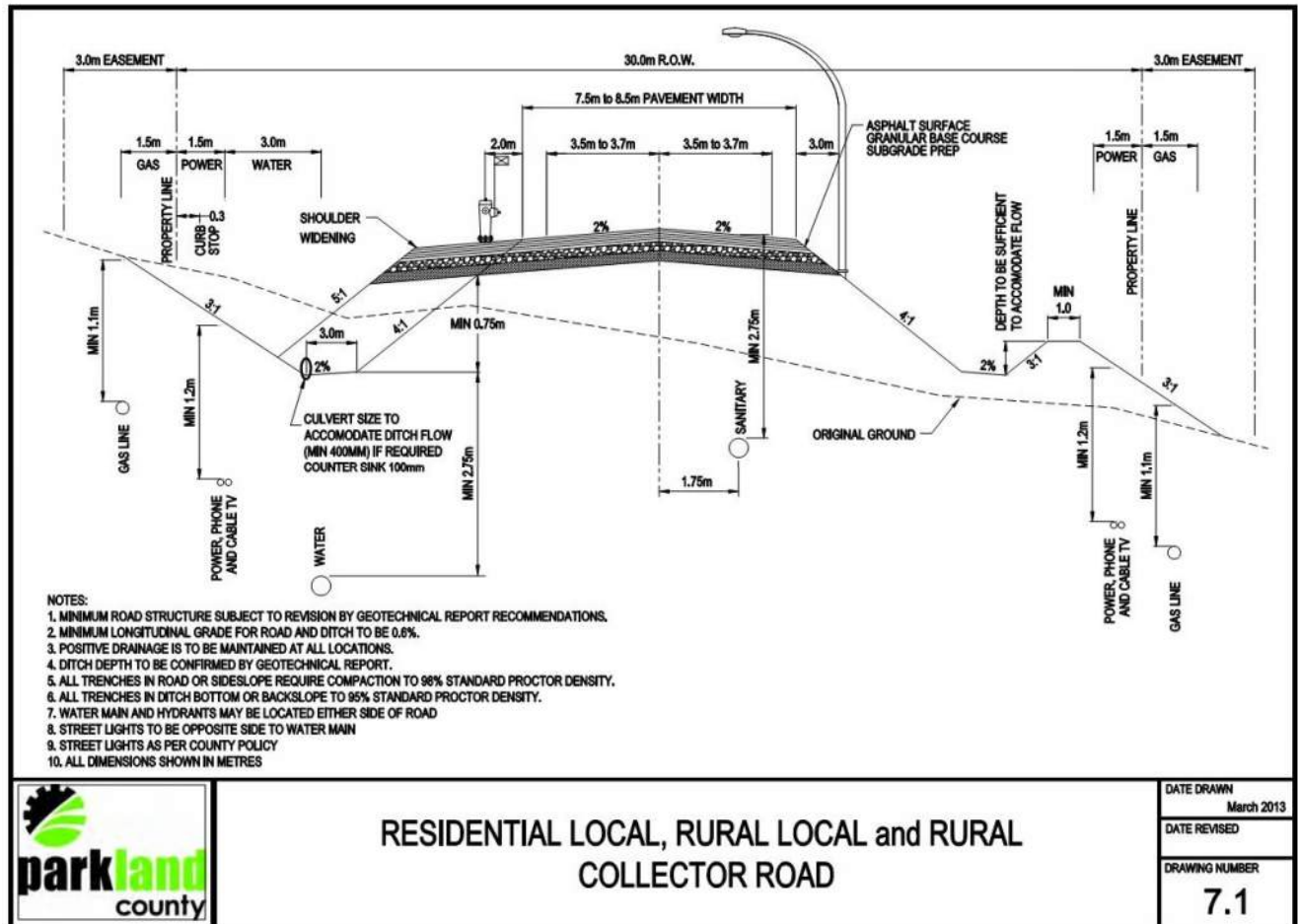
Table 7.1 – Roadway Design Standards

Design Criteria	Arterials		Major Collectors		Minor Collectors		Local		
	Rural RAU 90 RAD 90	Industrial RAU 90 RAD 90	Rural RCU 90	Industrial RCU 80	Rural RCU 90	Industrial RCU 70	Rural RLU 90	Industrial RLU 60	Residential RLU 60
Drawing Reference	No. 7.6/7.7	No. 7.6/7.7	No. 7.1	No. 7.4/7.5	No. 7.1	No. 7.3	No. 7.1	No. 7.2	No. 7.1
Design Speed (km/hr)	90	80	90	70	90	60	90	60	60
Right-of-Way Width (m)	40	40	40	40	30	30	30	30	30
Pavement ACP Width (m)	10.4/18.0	10.4/18.0	8.5	9.5/17.0	8.0	9.0	7.5	9.0	7.5
Travel Lanes (m)	2 x 3.7m 4 x 3.7m & Median	2 x 3.7m 4 x 3.7m & Median	2 x 3.7m	2 x 3.7m 4 x 3.7m	2 x 3.7m	2 x 3.7m	2 x 3.7m	2 x 3.7m	2 x 3.5m
Max. Gradient (%)	6	6	6	6	6	6	9	6	9
Min "k" Value Crest Curve	55	55	55	35	55	25	55	15	16
Min "k" Value Sag Curve Comfort Control	N/A	21	N/A	17	N/A	13	N/A	10	N/A
Min "k" Value Sag Curve Headlight Control	40	40	40	35	40	25	40	20	20
Max Super Elev. (%)	6	6	6	4	6	2	6	2 Normal Crown	2 Normal Crown
Min Radius of Curve (m)	340	340	340	250	340	190	340	130	130
Min Property Corner Cut at Intersections (m)	10	10	10	10	10	5	10	10	5
Parking	Restricted	Restricted	Permitted	Restricted	Permitted	Restricted	Permitted	Restricted	Permitted
Minimum Access/Intersection Spacing (m)	400	200	200	100	200	60	200	40	40

The nearest designations for comparison purposes for the local roads in this area appear to be a RLU 60 and RLU 90. Finished pavement widths for this road standard is normally 7.5m with maximum gradient of 9%.

The roadway typical standard for a Local Road shown on Drawing Number 7.1 indicates a range of 7.5 – 8.5m of pavement width with 4:1 sideslopes, a 3.0m wide ditch and 3:1 backslopes, all within a 30.0m right-of-way.

The roadway surfacing structure is also shown as an asphalt surface on a granular base course over a prepared subgrade.



6.4 Site Inspection

A detailed inspection of the roadway was conducted in October 2023. The following provides notes and photos of this inspection.

Range Road 262

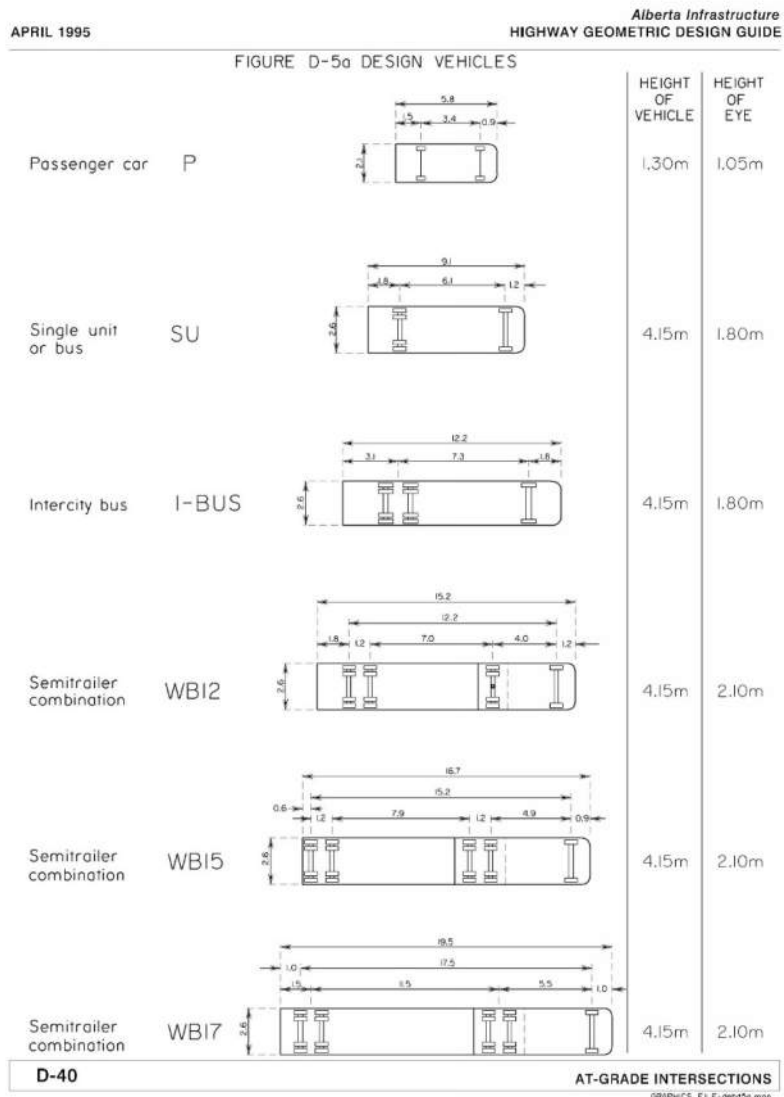
- Range Road 262 contains a paved surface and is approx. 7.5 – 8.0m wide.
- The side slopes seem to be 4:1 or better throughout.
- There is no existing illumination along this roadway.
- Road Ban limits exist likely in Spring, so large heavy trucks not often use this route.
- Road vertical profile is relatively flat with no issues with sag or crest curves.



Range Road 262: Viewing north, south of Sunset View Rd.

Overall, this local roadway appears to be adequate as a local road in providing access to the proposed development.

In review of the roadway widths during this assessment, various roadway widths were measured on the roads inspected. Local roads in Alberta can vary in widths from 5 to 10m. It is important to determine when roadway widths are sufficient to support the proposed traffic and when there may be concerns. The County Road Standards, tend to relate to new roads that are to be constructed by do not address the numerous existing roads that were built many years ago with lesser levels of service.



Vehicle widths are approximately 2.6m in width as shown below in the Alberta Transportation Design Guide. Therefore, any width less than 5.5m is deemed impassable.

This road appears to be functioning with its present width of 6.5m which allows for normal operation at the posted speed.

When referring to the Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads, Section 2.2.2, shown below provide some direction on acceptable road widths:

As per Table 2.2.2.1, road widths for Local Roads are required to be 6.0m minimum. Since the roadway of Range Road 262 is greater than 7.5m at 8.0m, the roadway is adequate as a local road in providing access to the proposed development.



2.2.2 LANE WIDTHS

increase in safety for lane widths beyond the 3.7 m range.³

2.2.2.1 Through Lane Widths

Design Domain: Quantitative Aids

Technical Foundation

Lane width and condition of the roadway surface have a significant influence on the safety and comfort of the travelling public. The capacity of a roadway is markedly affected by lane width, with wider lanes having the ability to carry a larger volume of traffic than a narrower lane. In general, safety increases with wider lanes up to a width of about 3.7 m. There is no further

Lane widths are dependent upon design speed and the volume of traffic the roadway is intended to carry, and the number and types of trucks on the roadway. Design domain widths for rural two-lane roadways are provided in Table 2.2.2.1 while lane widths for multilane rural roadways are given in Table 2.2.2.2. Lane widths for through lanes on urban roadways are provided in Table 2.2.2.3.

Table 2.2.2.1 Lane Widths for Two-Lane Rural Roadways

Design Speed (km/h)	Classification and Design Hour Volume					
	Local	Collector Design Hour Volume			Arterial Design Hour Volume	
		<250	250-450	>450	<450	>450
30, 40	3.0 - 3.7					
50	3.0 - 3.7	3.3 - 3.7	3.3 - 3.7	3.5 - 3.7		
60	3.0 - 3.7	3.3 - 3.7	3.3 - 3.7	3.5 - 3.7		
70	3.0 - 3.7	3.5 - 3.7	3.5 - 3.7	3.7		
80	3.0 - 3.7	3.5 - 3.7	3.5 - 3.7	3.7	3.5 - 3.7	3.7
90	3.3 - 3.7	3.5 - 3.7	3.5 - 3.7	3.7	3.5 - 3.7	3.7
100	3.3 - 3.7	3.5 - 3.7	3.5 - 3.7	3.7	3.5 - 3.7	3.7
110					3.7	3.7
120					3.7	3.7
130					3.7	3.7

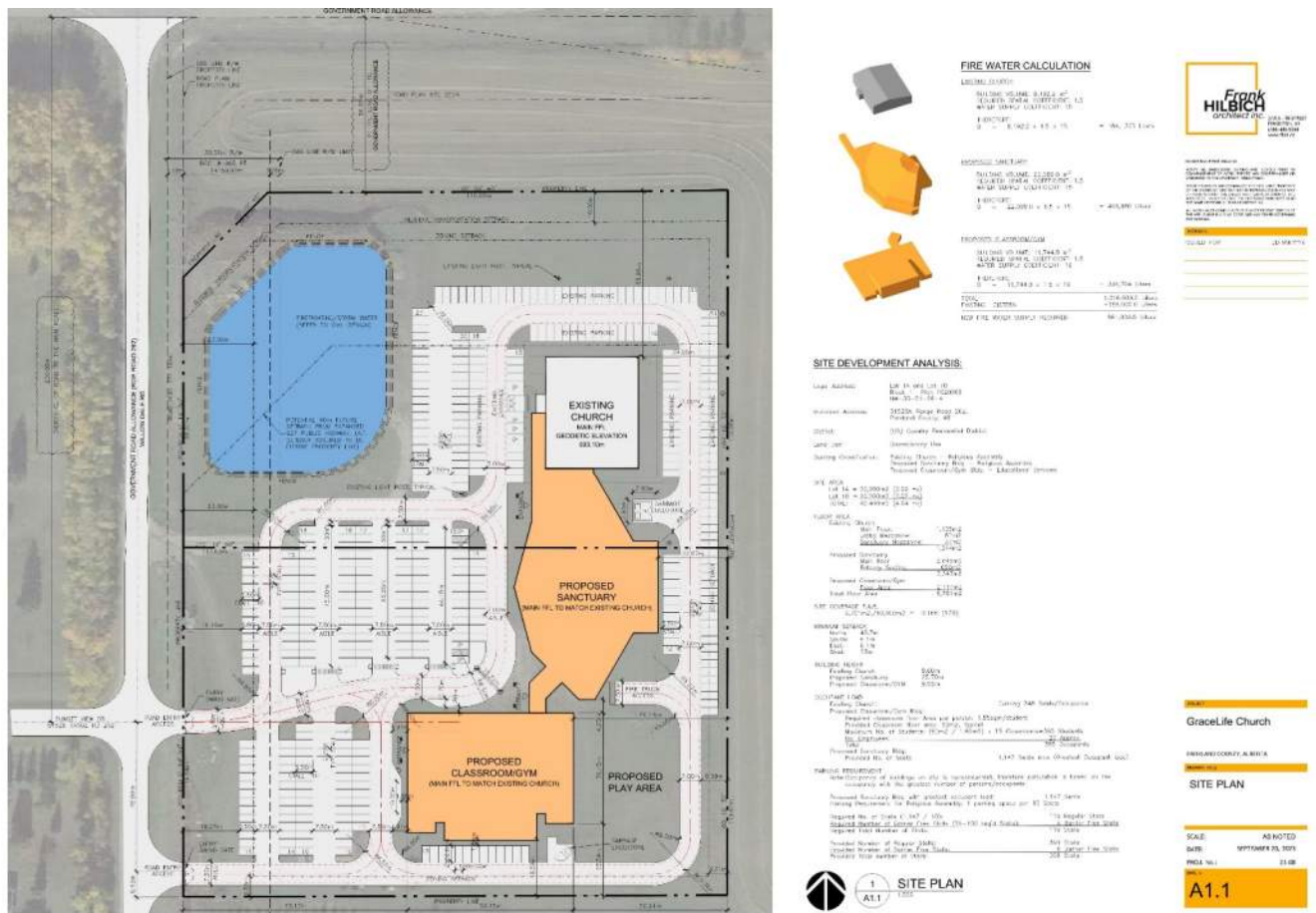
Table 2.2.2.2 Lane Widths for Multilane Rural Roadways

Design Speed	Lane Width (m)
less than 100 km/h	3.5 - 3.7
100 km/h and greater	3.7

6. CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions & Recommendations

The proposed development comprises of an expansion to the existing GraceLife Church site with the addition of a Sanctuary building and a Classroom/Gym building located within Lot 1A and Lot 1B in Block 1 in Plan 1020669 (4.04 ha) within NW 35-51-26-W4M as shown below. The expansion includes significant expansion of the parking lot and the addition of a Stormwater Management Pond. Access to the site would be made utilizing two new accesses on Willowdale Road (Range Road 262) and then to Highway 627:04 (Garden Valley Road).

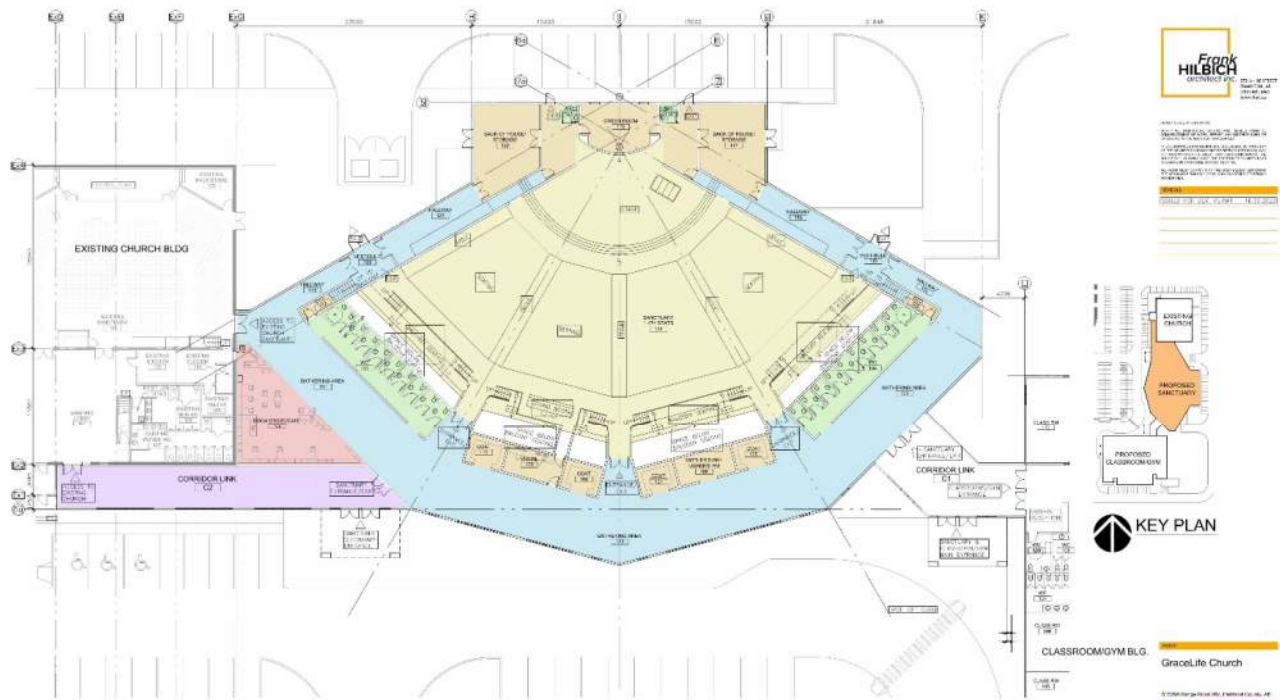


The existing access to the site will be closed. The first access will be constructed directly across of Sunset View Drive to the west.

The details on the building spaces are shown below.

TRAFFIC IMPACT ASSESSMENT

GRACELIFE CHURCH EXPANSION
LOT 1A & 1B, Blk. 1, Plan 1020669, NW-35-51-26-W4M
Parkland County
Hwy. 627:04 (Garden Valley Rd.) & Rge. Rd. 262 (Willowdale Rd.)



1 A2.3 SANCTUARY FLOORPLAN

Frank HILBICH
 ARCHITECTURE INC.
 2750 16th Street SW
 Calgary, AB T2M 4K6
 TEL: 403-243-1111
 FAX: 403-243-1112
 WWW.FRANKHILBICH.COM

DATE: 2020-09-14
 SCALE: AS SHOWN
 PROJECT: GRACELIFE CHURCH EXPANSION



KEY PLAN

CLIENT
 GraceLife Church

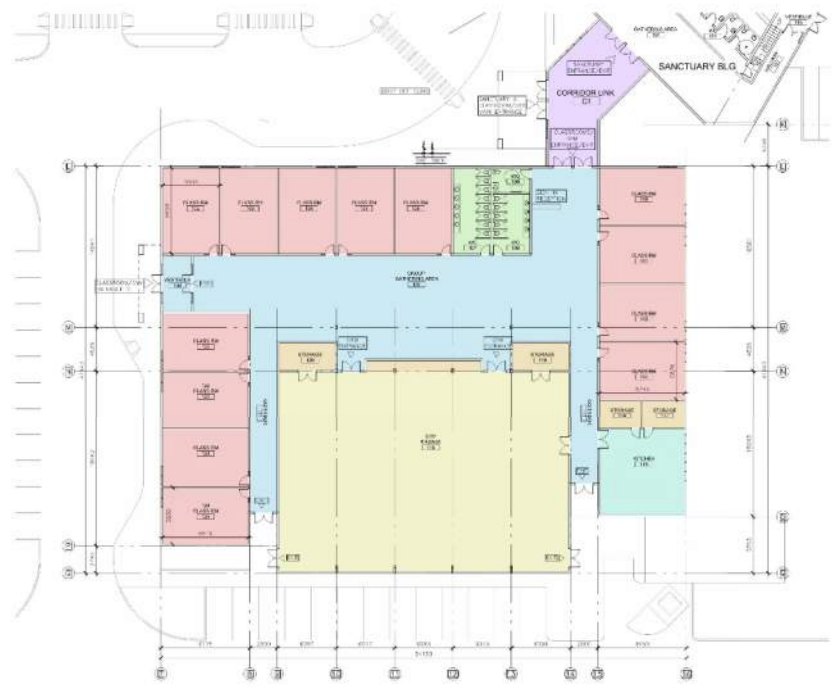
PROJECT
 GRACELIFE CHURCH EXPANSION

SCALE
 SCALE

DATE
 OCTOBER 14, 2020

REVISION
 23-28

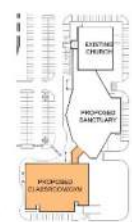
A2.3



1 A2.6 CLASSROOM/GYM FLOORPLAN

Frank HILBICH
 ARCHITECTURE INC.
 2750 16th Street SW
 Calgary, AB T2M 4K6
 TEL: 403-243-1111
 FAX: 403-243-1112
 WWW.FRANKHILBICH.COM

DATE: 2020-09-14
 SCALE: AS SHOWN
 PROJECT: GRACELIFE CHURCH EXPANSION



KEY PLAN

CLIENT
 GraceLife Church

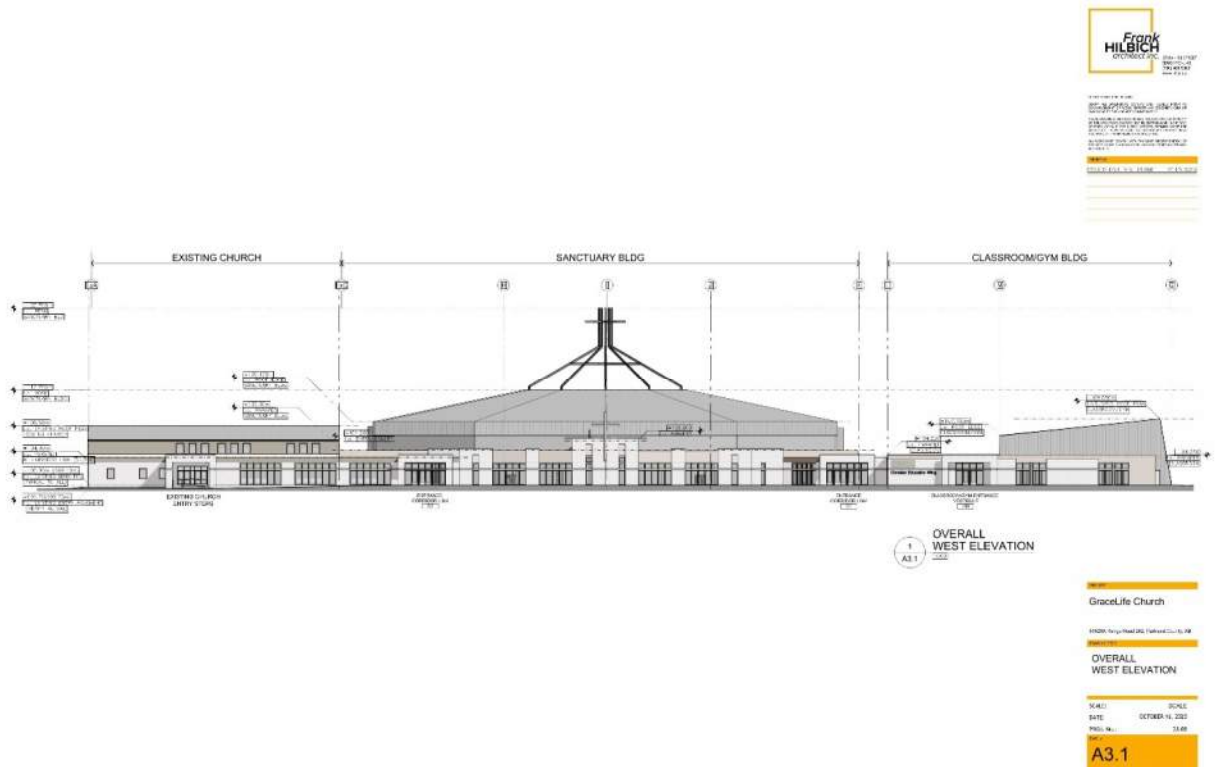
PROJECT
 GRACELIFE CHURCH EXPANSION

SCALE
 SCALE

DATE
 OCTOBER 14, 2020

REVISION
 23-28

A2.6



The proposed expansion is projected to add traffic to the site for use of the new facilities as follows:

- Mondays: No activities planned.
- Tuesdays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
- Wednesdays: Late Morning Use: 80 vehicles from 9:30am to 11:30am
- Wednesdays: Evening Family Use: 60 families from 7:00pm to 10:00pm
- Thursdays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
- Fridays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
(2 times per month only)
- Saturdays: Evening Family Use: 30 – 40 families from 7:00pm to 10:00pm
(2 times per month only)
- Sundays: Daily Use: Regular use as per past; already accounting for in traffic

Overall, the increase in traffic for this site could be summarized to add 80 trips per day on the average. On Wednesdays the traffic volume peaks at approximately 140 trips in and 140 trips out for the whole day. On Mondays and every second Fridays & Saturdays, there may be no additional trips all day.

It is important to note that none of this increased activities and additional traffic generation will occur during the AM Peak Weekday Hour (7:30am – 8:30am) of traffic or the PM Peak Weekday Hour (4:30pm – 5:30pm) of traffic for the local roadways and highways in the area.

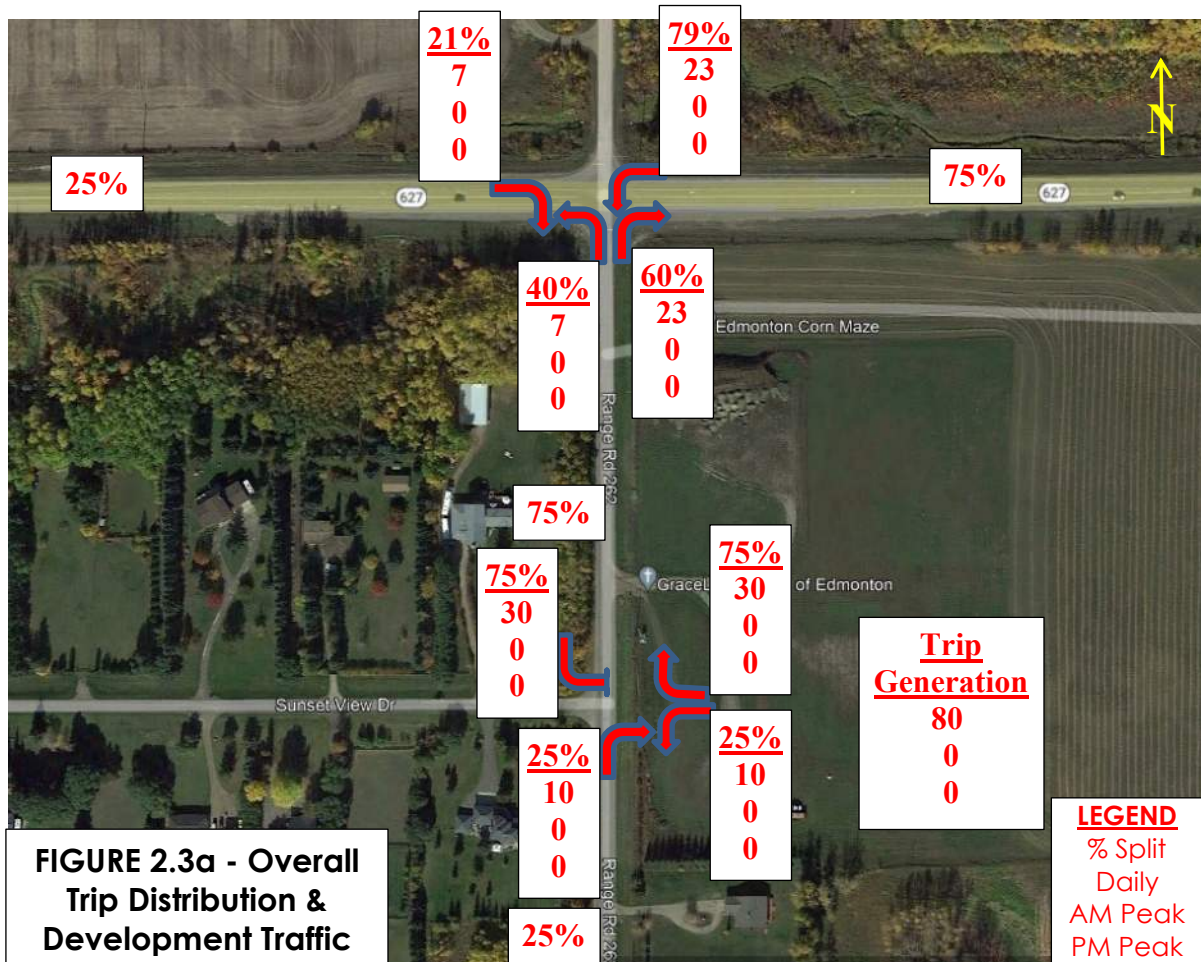
Projected Traffic Summary

Daily Traffic:	= 80 trips per day
AM Peak Hour:	= 0 trips per hour
PM Peak Hour:	= 0 trips per hour

These values above represent the traffic generation once the development is fully built and operating.

2.3 Trip Distribution & Development Traffic

Development traffic is projected to distribute similarly to existing traffic at the intersection of Highway 627:04 & Rge. Rd. 262 as follows:



Projected AADT values for Hwy. 627:04 are presented in the table below for key times:

Existing Highway Traffic Forecast, Daily Volumes

Year	Hwy. 627:04 West Leg	Hwy. 627:04 East Leg	Rge. Rd. 262 South Leg
2019	5848	6264	1386
2029 (10 Year)	7692	8188	1650
2039 (20 Year)	9537	10113	1922

Peak hour traffic loading (100th highest hour) is shown below for am/pm volumes:

Existing Highway Traffic Forecast, Peak Hour Volumes

Year	Hwy. 627:04 West Leg a.m. & p.m.	Hwy. 627:04 East Leg a.m. & p.m.	Rge. Rd. 262 South Leg a.m. & p.m.
2019	698 / 729	809 / 809	159 / 131
2029 (10 Year)	923 / 1055	970 / 1060	190 / 158
2039 (20 Year)	1147 / 1206	1301 / 1311	220 / 183

The following tables show the estimated combined traffic volumes at the Highway 627:04 and Rge. Rd. 262 intersection.

Combined Highway Traffic Forecast, Daily Volumes

Year	Hwy. 627:04 West Leg	Hwy. 627:04 East Leg	Rge. Rd. 262 South Leg
2024	5862	6310	1446
2034 (10 Year)	7706	8234	1710
2044 (20 Year)	9551	10159	1982

Peak hour traffic loading (100th highest hour) is shown below for am/pm volumes:

Combined Highway Traffic Forecast, Peak Hour Volumes

Year	Hwy. 627:04 West Leg a.m. & p.m.	Hwy. 627:04 East Leg a.m. & p.m.	Rge. Rd. 262 South Leg a.m. & p.m.
2024	698 / 732	809 / 809	159 / 131
2034 (10 Year)	923 / 1055	970 / 1060	190 / 158
2044 (20 Year)	1147 / 1206	1301 / 1311	220 / 183

Since the proposed development is not projected to add any additional traffic during the AM Peak Hour or the PM Peak Hour of traffic, this development does not trigger these improvements (additional left turn storage) being made in the future. The left turn capacity for WB to SB traffic is sufficient for the next 20 years during the off-peak hours and evening hours when the addition to the church site is to be mainly used. Therefore, no improvements are recommended.

Illumination is not warranted at the intersection of Highway 627:04 and Range Road 262 presently and for the next 20 years upon calculation of the illumination warrant.

Location	Year	Illumination Warrant Score	Illumination Warrant Met? (Min. 120)	Signalization Warrant Score	Signalization Warrant Met?
Highway 627:04 & Rge. Rd. 262	2024	121 Delineation Lighting Only	Traffic Volumes Too Low		Traffic Volumes Too Low
Highway 627:04 & Rge. Rd. 262	2034	141 Delineation Lighting Only	Traffic Volumes Too Low		Traffic Volumes Too Low
Highway 627:04 & Rge. Rd. 262	2044	141 Delineation Lighting Only	Traffic Volumes Too Low	1	Traffic Volumes Too Low

The illumination analysis indicates for all three time milestones that “Illumination Warranted Delineation Lighting to Illuminate Pedestrians or Cross Street Traffic”. It is important to note that neither pedestrians are using or projected to use this rural intersection on the highway or any significant cross traffic is occurring. Also, the traffic turning movement diagrams projects only 1 cross movement per day in each direction on Range Road 262 since the north leg of intersection is within the Enoch First Nations. This is very minimal and would likely occur during daylight. Therefore, illumination is not recommended for this intersection for the next 20 years for these reasons.

Signalization is not warranted at the intersection for the next 20 years.

In summary, the proposed development does not impact the existing transportation infrastructure at the Highway 627:04 and Range Road 262 intersections from 2024 to 2044.

6.2 Closure

We trust the information provided meets your present requirements. Should any questions arise, please contact our office at your convenience.

Darcy O. Paulichuk, P. Eng.

Nov. 20, 2023
APEGGA Permit to Practice Number: P12132

APPENDIX A

ALBERTA HIGHWAYS TRAFFIC COUNT

APPENDIX B

2023 – 2044 TURNING MOVEMENT DIAGRAMS
– Highway 627:04 & Rge. Rd. 262

APPENDIX C

ILLUMINATION WARRANTS SYNCHRO ANALYSIS