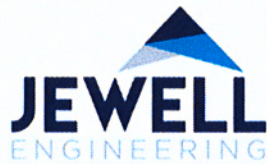


Nautical Lands
Wellings of Picton Phase 2
Traffic Impact Statement



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February 27, 2019

Nautical Lands Contractors Inc.
700 Finley Avenue, Unit #4
Ajax, ON
L1S 3Z2

Attn: Peter Gregor, B.Tech, Arch. Sci., PMP
VP of Planning and Design

Re: Phase 2 Development
Traffic Impact Statement
Our File 180-4466

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1.0 BACKGROUND

Jewell Engineering (JE) has been contracted by Nautical Lands Contractors Inc., to provide traffic engineering services to address the traffic impacts of the proposed residential development adjacent to County Road 49 in Picton, Prince Edward County; and, recommend mitigation measures if necessary.

Traffic impact analysis is a fundamental part of the continuous planning process of land use and the transportation infrastructure. The goal is to provide various interest groups and decision-makers with data regarding the use of developed land and the impacts the development generated vehicular traffic has on the transportation system. Traditionally, the analysis includes addressing the impacts of a proposed development for present and future planning horizons (i.e., 5 years). The impact area is considered "the site access" and possibly a close regional road intersection. Once the traffic is on the regional road network, it is then considered as part of the "background traffic".

The evaluation of "new" traffic is based on the performance of the intersection(s) impacted during the A.M. and P.M. peak hours of the adjacent main road. The performance of an intersection is based on Level of Service (LOS) and safety.

In this study, the traffic impact is the proposed entrance on County Road 49.

Low traffic developments such as this typically do not significantly impact the LOS of a main road in a rural or town setting. The main road has "free flow"; the proposed entrance has "stop control". A trend in the planning process has been



the preparation of a "TIS Letter Report" to provide a cursory review of the traffic scenarios / picture in-lieu of detailed analysis.

2.0 EXISTING CONDITIONS

The proposed development is in an urban setting in the northerly section of the Town of Picton. The land use is zoned "R" (Residential). The adjacent land use is low and medium density residential uses. County Road 49 is an arterial highway that serves the development along with the town and rural environs. The corridor is a key transportation link to Highway 401. The posted speed is 60 km/hr at the development site; a short distance into town the posted speed is 50 km/hr.

County Road 49 has an urban cross section with +-7.35m roadway surface, curb and gutters, and a +-1.8m asphalt boulevard. Sections of the roadway also consist of open ditches.

3.0 PROPOSED DEVELOPMENT

The proposed residential development consists of 50 townhouse units, with the possibility of five (5) future units, in conjunction with a two lane entrance to County Road 49 as seen in Attachment 1.0 – Proposed Development Site Plan.

3.1 Proposed Development Entrance

A two lane private entrance with County Road 49 is proposed as seen in Attachment 1.0 – Proposed Development Site Plan. The proposed entrance features an urban cross section in conjunction with curbs, asphalt roadway, and street lighting.

As seen in Attachment 2.0 – Proposed Entrance Plan and Profile, the vertical control with the shallow grade approach of 3% (*TAC recommends 0.5% to 3%*) flat entrance approach offers safety to vehicles entering and leaving. The entrance will have a stop sign for traffic control and stop bar placed 3.0 m. from the edge of pavement of County Road 49.

For a stopped vehicle the departure sight line distance is considered for each of the two basic maneuvers that may occur at the entrance;

- To turn left into the intersecting roadway by first clearing traffic approaching from the left, and then to accelerate to the normal running speed of the vehicles from the right; or
- To turn right into the intersecting roadway by entering the traffic stream approaching from the left and accelerate so as to not cause interference with the traffic stream.

The critical movement is the left turn.

The sight distance for a crossing maneuver is based on the time it takes for the stopped vehicle to clear the intersection and the distance that a vehicle would travel along the major roadway at its design speed in that amount of time. As such, the required crossing time depends upon the perception and reaction time of the crossing driver, the vehicle acceleration time, the width of the major roadway, the length of the crossing vehicle and the speed of an approaching vehicle on the major roadway.

According to the TAC Geometric Design manual, the required minimum departure sight distance along the major highway is given by the following equations;

$$D = V (J + t) / 3.6$$

Where;

D = minimum crossing sight distance along the major roadway from the intersection, (m);

V = design speed of the major highway;

J = perception and reaction time of crossing driver (Use 2,0 sec.);

t = time to cross the major roadway pavement (TAC Figure 2.3.3.3)

The time t is derived from a range of crossing distances for different design vehicles. The crossing distance is computed from;

$$S = d + w + L$$

Where;

S = distance travelled during acceleration (m.);

d = distance from near edge of pavement to front of stopped vehicle (Use 3.0 m.);

w = width of pavement along the path of entering vehicle (m.);

L = overall length of the crossing vehicle (m.)

The value "S" is used in TAC Figure 2.3.3.3 (Attachment 4.0) to determine "t".

Regarding the proposed entrance, "S" was as follows;

$$S = 3 + 8 + 4 = 16 \text{ m.}$$

$$D = 80 (2 + 4.3) / 3.6 = 140 \text{ m.}$$

JE conclude that the desirable departure sight distance for the proposed access is approximately 140 m.

In highway planning and design, road agencies employ “minimum” and “desirable” values to some design parameters to assist with the existing conditions / constraints that co-exist. For this criteria, the MTO uses the “three second rule”; a driver needs one second each for perception, reaction and braking for an emergency stop. For a design speed of 80 km/hr, the minimum distance travelled in 3 seconds is 65 m.

JE conclude the minimum safe stopping distance is 65 m.

JE checked the visibility in the field by parking a vehicle at the proposed entrance location 3.0 m. from the edge of pavement of County Road 49. Then, the distance the vehicle could be seen on County Road 49 southbound was noted and measured.

JE found that the departure sight distance for the proposed entrance is approximately 110 m.

JE carried out a “reality” check of the key design factor, “vehicle speed”, on Thursday February 28, 2019. JE also completed a sample random spot speed survey of the southbound traffic on County Road 49, between 2:00 and 4:00 p.m., whereby 56 vehicles were observed with an average speed of 65 km/hr and range of 50 – 82 km/hr.

3.2 VEHICLE TRIP GENERATION

According to ITE Trip Generation Manual, the proposed development will reflect ITE Code 230 which will result in the following conditions at the entrance with County Road 49;

LAND USE	UNITS	A.M. PEAK HOUR			P.M. PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Townhouse	55	4	21	26	20	9	29

3.3 VEHICLE TRIP DISTRIBUTION AND ASSIGNMENT

Based on the development location on the northern fringe of the Town of Picton and County Road 49 being an arterial road corridor connecting to Highway 401, JE expect the following traffic conditions;

Assume County Road 49 Average Daily Traffic (ADT) is approximately 6,000.

The vehicular peak hour traffic ranges from 8 to 12 percent. Assuming 10% the peak hour traffic will be approximately 600 vehicles/hour. Therefore, the vehicular traffic distribution with a 60/40 split in the peak direction on County Road 49 will be as follows;

<u>COUNTY ROAD 49</u>	<u>A.M. PEAK HOUR</u>	<u>P.M. PEAK HOUR</u>
Northbound	240	360
Southbound	360	240

As part of the study, JE carried out a safety audit of the proposed entrance location. A traffic demand sample was collected on Thursday, February 28, 2019 at County Road 49 and Wellings Access Road. Between 4:00 and 5:00 p.m., JE found that the vehicular demand was 400 vehicles/hour with a directional distribution 58% northbound and 42% southbound. The traffic demand equates to an ADT of 4,000.

4.0 IMPACTS OF DEVELOPMENT

JE reviewed the impact the proposed development will have on County Road 49 in regard to the warrant for a left turn lane.

According to the MTO planning framework, the proposed development entrance and County Road 49 will have the following traffic parameters;

County Road 49, $V_a = 372$ vph and $V_o = 248$ vph

Northbound Left Turn P.M. Peak Hour = 12 vph or 3.2 % (Use 5% MTO Chart)

Design Speed = 80 km./hr

Based on MTO Figure EA-14 (Attachment 3.0) with 80 km/hr design speed and left turns 5%, JE conclude that a left turn lane is not warranted on County Road 49 at the proposed development entrance.

5.0 FINDINGS AND CONCLUSIONS

JE found that a left turn lane on County Road 49 northbound is not needed with an ADT of 6,000. Should the traffic on County Road 49 be much higher, the conclusion would be similar as the left turn demand during peak hours is very low, higher background traffic

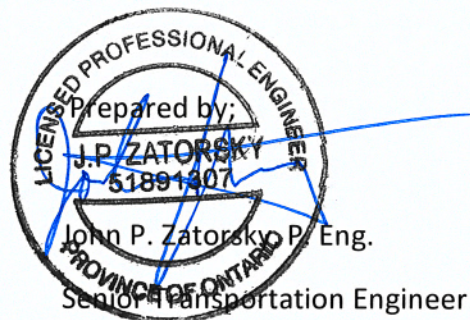
would not enhance the warrant as the ADT would need to be in the 10,000 range. In the current scenario, the left turns are 3.2% of advancing traffic; as background volume increases, the % left turns decrease. If the % left turns drop to 2% the charts become irrelevant.

The traffic generated by the proposed development is not an issue regarding mitigation of traffic impacts. It shall be of note, that a minor visibility constraint does exist on County Road 49 caused by the horizontal curve to the north and the adjacent building lot impeding partial sightlines.

The proposed entrance however meets the MTO and TAC design criteria for visibility and safe vehicle stopping distance. The prevailing speed appears less than the design speed. A factor of safety will still exist.

6.0 RECOMMENDATIONS

JE conclude that the performance of the proposed development entrance and County Road 49 will operate safely with a good Level of Service (LOS). JE recommend to mitigate the visibility issue with the installation of a traffic sign, "INTERSECTIONS AHEAD" to be located before the horizontal curve on County Road southbound. This signage is commonly used on arterial highways as the setting changes from rural to urban.

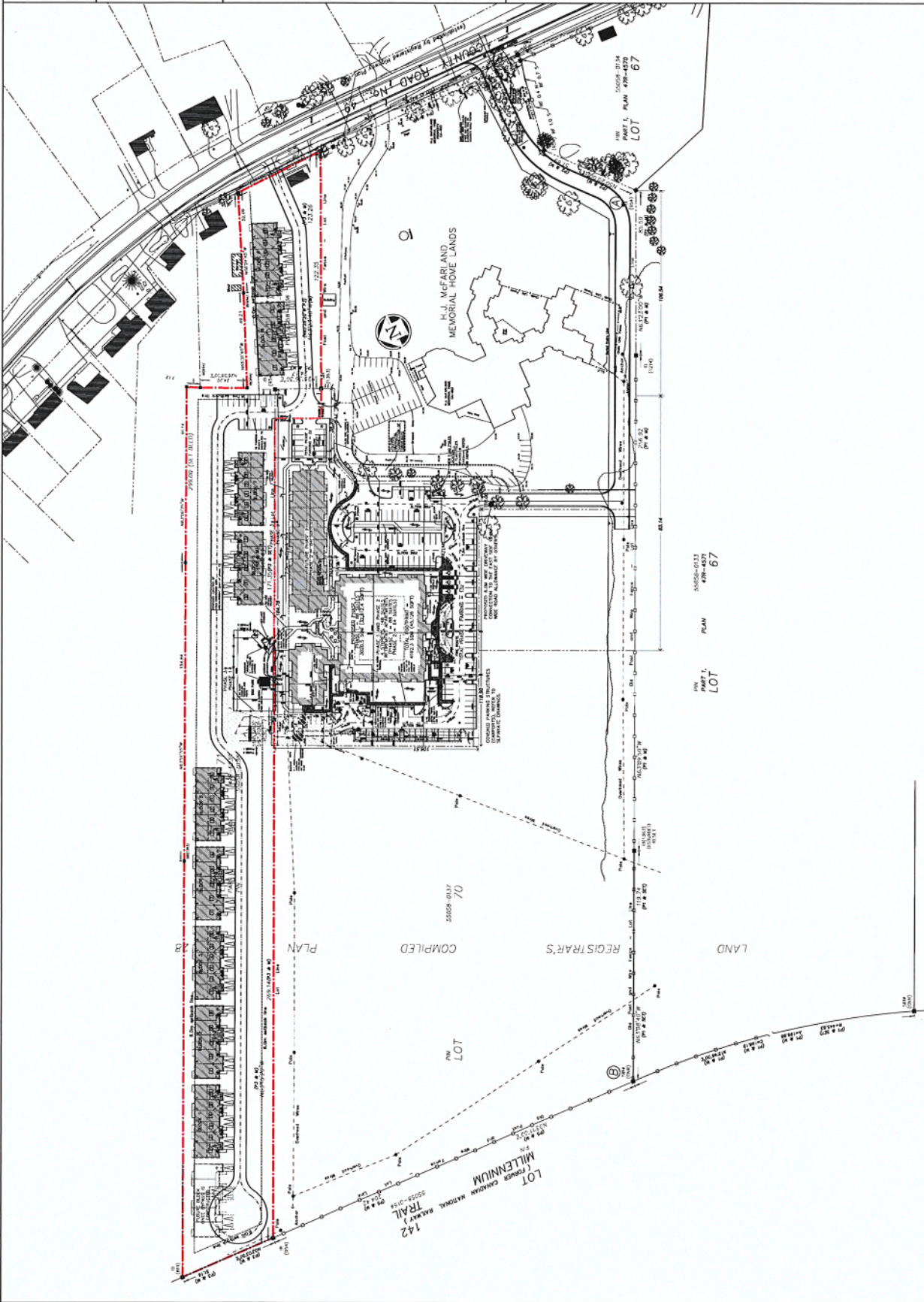


Attachment 1.0
Proposed Development Site Plan



FILE NO. 2017-01
 PLAN OF SURVEY OF
 ALL OF LOT 70
 PLAN 28 REGISTRAR'S COMPILED
 TOWNSHIP OF HALLOWELL
 CITY OF MUNICIPALITY OF
 FRANCIS BAY
 M.W. 1:1,000
 METRIC
 PREPARED BY: M. J. McFARLAND
 DATE: 11/20/17
 PROJECT NO. 17-01

SITE INFO.
LOT AREAS:
 PHASE 1 AREA = 1302.0 SQM
 PHASE 2 AREA = 2474.2 SQM
 PHASE 3 AREA = 4371.4 SQM
 TOTAL LOT AREA = 8147.6 SQM
BUILDING FOOTPRINT AREAS:
 PHASE 1 BLDG AREA = 2070.5 SQM
 PHASE 2 BLDG AREA = 4371.4 SQM
 PHASE 3 BLDG AREA = 4371.4 SQM
 TOTAL BLDG AREA = 8147.6 SQM
TOTAL LOT COVERAGE = 21.4%
TABLE 1. EXISTING LAND USE TYPES:
 1. BEDROOM + 90M = 5
 2. BEDROOM + 90M = 24
TABLE 2. ADDITIONAL PROPOSED UNIT TYPES:
 PHASE 1 UNITS PHASE 2 = 65
 PHASE 3 UNITS PHASE 3 = 65
TOTAL # UNITS PHASE 2 = 65
TOTAL # UNITS PHASE 3 = 65
 UNIT TYPE 'A' = 2 BEDROOM W/O GARAGE = 18
 UNIT TYPE 'B' = 2 BEDROOM W/O GARAGE = 12
 UNIT TYPE 'C' = 1 BEDROOM W/O GARAGE = 20
TOTAL # OF TOWNHOUSE UNITS = 50



DATE	DEC 2017
SCALE	1:1000
PROJECT NO.	M.W.
DATE	1716

PROPOSED BY	THE WELLINGS OF PICTON, QUEBEC, CANADA
DATE	11/20/17
PROJECT NO.	17-01
DATE	1716

NAUTICAL Land Group
Exceptional Retirement Living

LOT 67
 PART 1
 PLAN 478-4371

LOT 70
 PART 1
 PLAN 478-4371

LOT 142
 (FORMER CANTON MARSH BANK) TRAIL
 5555-9154

Attachment 2.0

Proposed Entrance Plan and Profile

Attachment 3.0

MTO Fig. EA-14

Dedicated Left Turn Requirements

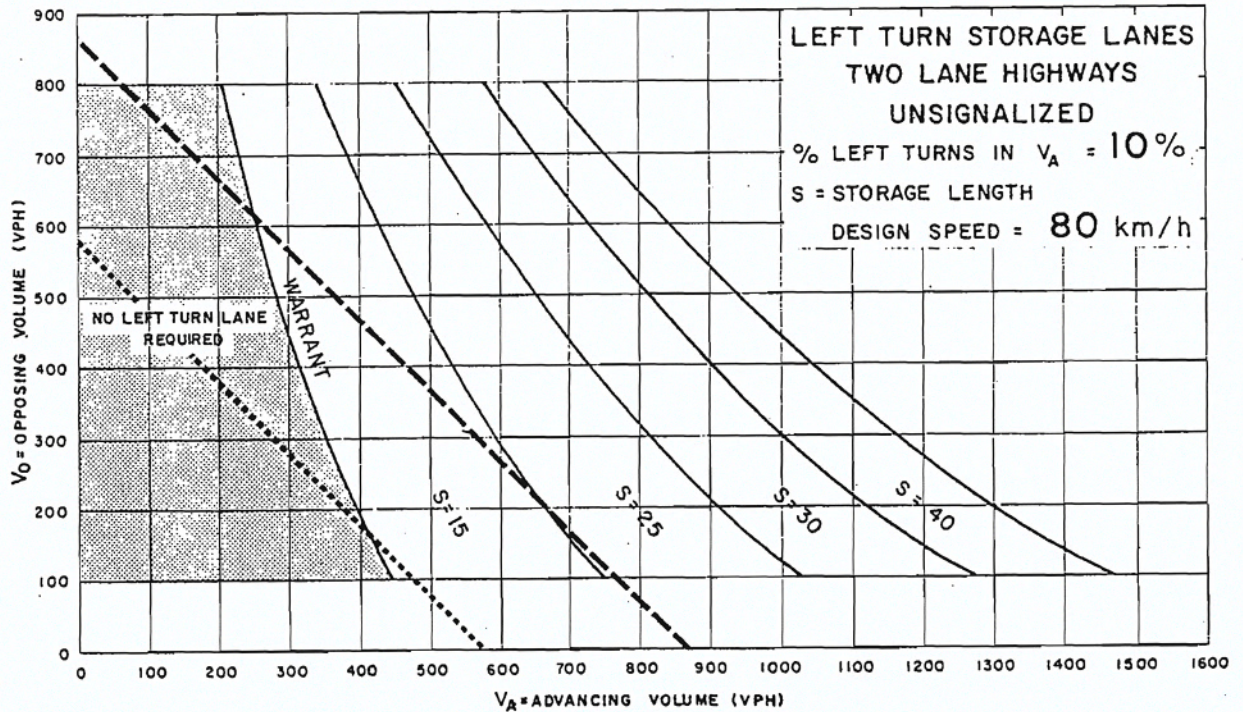
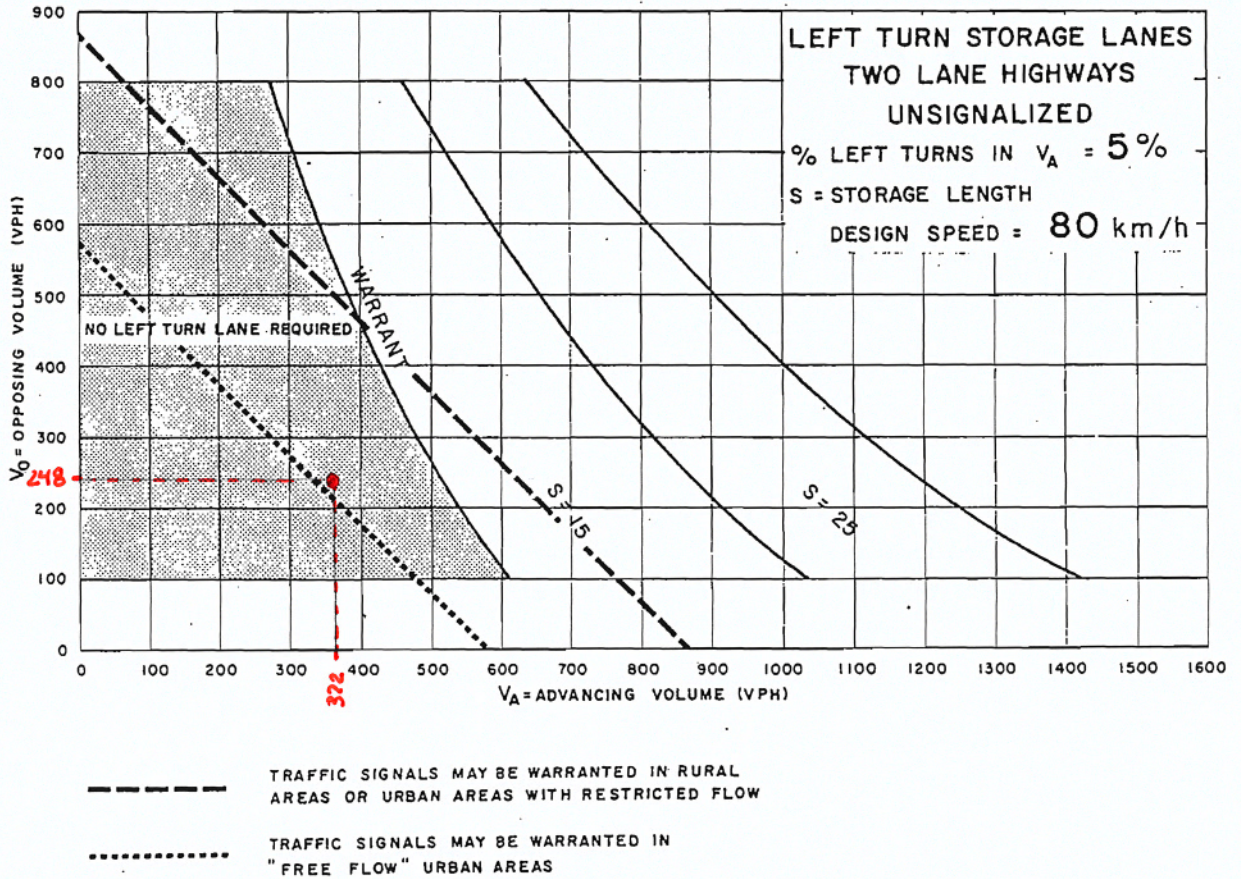


Figure EA-14

Attachment 4.0

Acceleration Curves From Stop Control

Figure 2.3.3.3 Assumed Acceleration Curves (Acceleration From Stop Control on Minor Road)¹⁰

