F.R. Berry & Associates
TRANSPORTATION PLANNING CONSULTANTS

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March 15, 2021

Our Ref. **2106**

Harrington McAvan Ltd.
41 Main Street
Unit 102
Unionville ON
L3R 2E5

Attn. Mr. B. Janssen

Dear Mr. Janssen:

RE: PROPOSED GRAVEL PIT
PART LOTS 16 and 17, CONCESSION 1, NTR
MUNICIPALITY OF THAMES CENTRE

TRAFFIC IMPACT ASSESSMENT

In 2019, F.R. Berry & Associates prepared a traffic impact assessment report on behalf of Aaroc Aggregates for a proposed gravel pit located on the north side of Trafalgar Street, west of Hunt Road[1]. Aaroc Aggregates has now acquired additional property to the north of the original site and proposes to locate the access to the pit to Dundas Street, Middlesex County Road 2. The proposed access will align with Cobble Hills Road. The location of the site is shown in **Figure 1**.

Existing Conditions
Dundas Street is a two lane rural arterial with a posted speed limit in the vicinity of the site of 80km/h. Cobble Hills Road is a two lane local road. Currently, the intersection of Dundas Street and Cobble Hills Road is a tee intersection, controlled by a stop sign on the southbound, Cobble Hills Road , approach. The southbound approach has a single shared lane. The eastbound approach on Dundas Street incorporates a slip-by lane while the westbound approach has a short right turn taper.

[1] Proposed Gravel Pit, Part Lots 16 and 17, Concession 1, NTR, Municipality of Thames Centre. Traffic Impact Assessment, F.R. Berry & Associates, April 3, 2019.

For the purposes of this assessment, a traffic count was conducted at the intersection on February 24, 2021. Peak hour turning movements derived from this count are shown in **Figure 2**. The count report is contained in Appendix A.

At this time, traffic patterns have been disrupted by the Covid-19 pandemic. Traffic counts are generally lower than might be expected under "normal" conditions. In order to adjust the counts, reference was made to a traffic counts made for the original study (Ref. 1) in September, 2016. A copy of this count report is contained in Appendix A. Assuming the same growth factors that were used for the original study, 1.5 percent per year, morning and afternoon peak hour volumes west of Hunt Road were projected to 2021 and compared with the February, 2021 volumes. The comparison resulted in morning peak hour volumes in **Figure 2** being increased by a factor of 1.38 in the morning peak hour and 1.24 in the afternoon peak hour. The factors were applied to traffic volumes on Cobble Hills Road as well as through volumes on Dundas Street. Adjusted peak hour volumes are shown in **Figure 3**.

Proposed Development

The proposed operational plan for the site is shown in **Figure 4**. Extraction would begin in the north part of the site and continue to the south.

Aaroc Aggregates have applied for a licence which will allow for the removal of up to 400 000 tonnes of sand and gravel annually. Assuming approximately 200 construction days a year, the average daily extraction would be 2 000 tonnes, or about 65 truck loads. Over a ten hour working day, the average hourly movement would be 6.6 loaded trucks out and 6.5 empty trucks in. For the purposes of this assessment, a peak hour volume of ten truck movements in and ten out was assumed. Since the primary uses of the aggregate would be in the London Area, 90 percent of the projected truck movements would be to and from the west. Peak hour site generated traffic is shown in **Figure 5**.

Projected Traffic

The pit is expected to begin operation in 2022. Existing peak hour traffic volumes from **Figure 3** were projected to 2027, five years beyond the start of operations. An annual growth rate of 1.5 percent was assumed. **Figure 6** shows projected total peak hour turning volumes.

Left Turn Lane Requirements

As noted above, eastbound Dundas Street has a slip-by lane at its intersection with Cobble Hills Road. A slip-by lane does not have the same dimensions as a conventional left turn lane but provides an opportunity for traffic to by-pass a vehicle stopped waiting to make a left turn.

In order to determine the justification for a full left turn lane, an analysis was made for existing unadjusted peak hour demand (Figure 2) using Ministry of Transportation methodology. The analysis is summarized in Appendix B. The analysis shows that a left turn lane is warranted under current conditions.

The opening of an access to the proposed pit would not affect the justification for an eastbound left turn lane, since added truck volumes are a negligible volume compared to total volumes. One westbound left turn truck movement would not in itself justify a separate lane and would not add to the opposing volume in the analysis.

Sight Distance
Fully loaded gravel trucks entering a main highway from a stop condition require a significant distance in which to attain a speed consistent with the operating speed of the highway. Appendix C contains two charts from the MTO Geometric Design Manual which suggest that a minimum sight distance of 300 to 400 metres would be required on Dundas Street. Estimated available sight distances are approximately 450 metres to and from the west and over 500 metres to and from the east. Adequate sight distances are available.

Level of Service.
The intersection of Dundas Street with Cobble Hills Road and the site access was analyzed for volume to capacity (v/c) ratios, delays and queue lengths using the Synchro 10 analysis program. The analysis was made for projected peak hour conditions (Figure 6). The results of the analysis are summarized in Table 1. Analysis reports are contained in Appendix D. All of the vehicles entering and leaving the site were assumed to be heavy trucks.

The analysis also assumed a de facto left turn lane on the eastbound Dundas Street approach. While, as noted above, it is not a fully developed left turn lane, the slip-by lane effectively functions as one and reduces, if not eliminates, delays to through traffic.

The analysis indicated that all approaches except the site access will operate at an acceptable level of service under projected peak hour conditions. The southbound approach on Cobble Hills Road will be subject to average peak hour delays of up to 30 seconds. This is considered acceptable for a minor road intersecting an arterial.

The northbound approach from the site will be subject to average delays of up to 80 seconds, level of service F. It should be noted, however, that the number of vehicles (trucks) on this approach is estimated to be no more than ten in any hour. In off-peak

hours, the average delays will be much less. The projected delays will not affect the operation of the proposed gravel pit.

Summary and Conclusions

Based on the expected annual tonnage to be extracted from the proposed pit, it is estimated that, for design purposes, there would be a total of ten trucks entering and ten leaving in each of the peak hours.

Peak hour traffic projections assumed a 1.5 percent annual increase in through traffic volumes on Dundas Street.

Sight distances on Dundas Street meet the minimum distances required for a loaded truck to enter the highway and accelerate to an appropriate speed without delaying other traffic.

Traffic generated by the proposed gravel pit is not sufficient to justify construction of a left turn lane on Dundas Street. However, a left turn lane analysis suggests that a full left turn lane would be warranted for eastbound traffic turning left to Cobble Hills Road

Under projected peak hour conditions, the Dundas Street and Cobble Hills Road approaches will operate at an acceptable level of service. Trucks exiting the site will be subject to delays.

Very truly yours
F. R. Berry & Associates

Frank R. Berry, P.Eng.
Principal

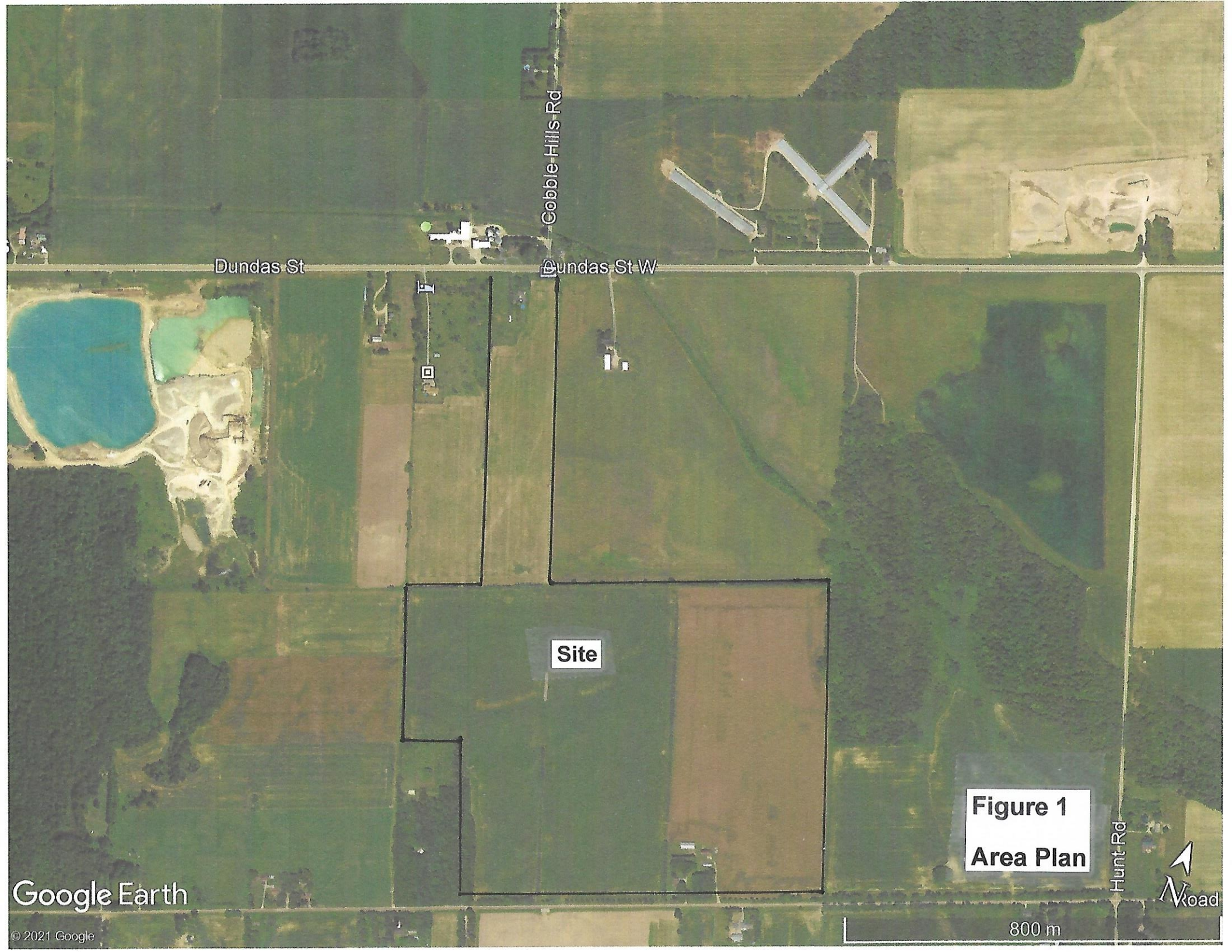
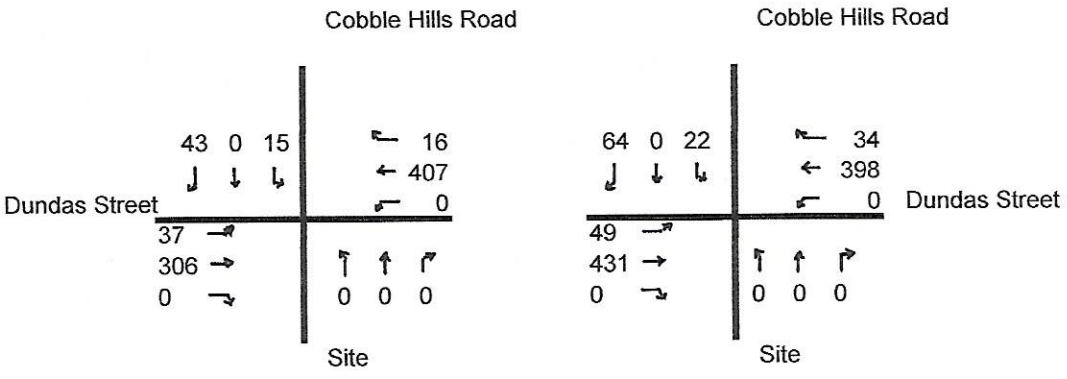


Figure 1

Area Plan



AM Peak Hour **PM Peak Hour**

Figure 2

Existing Traffic
24 February, 2021

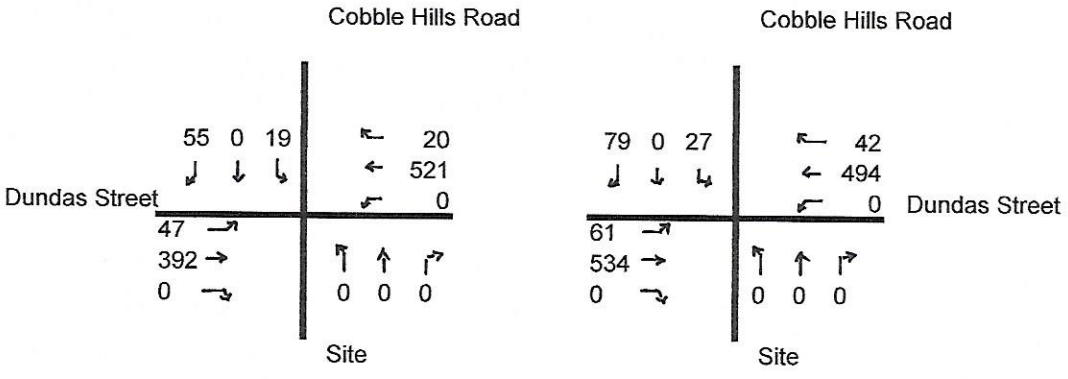
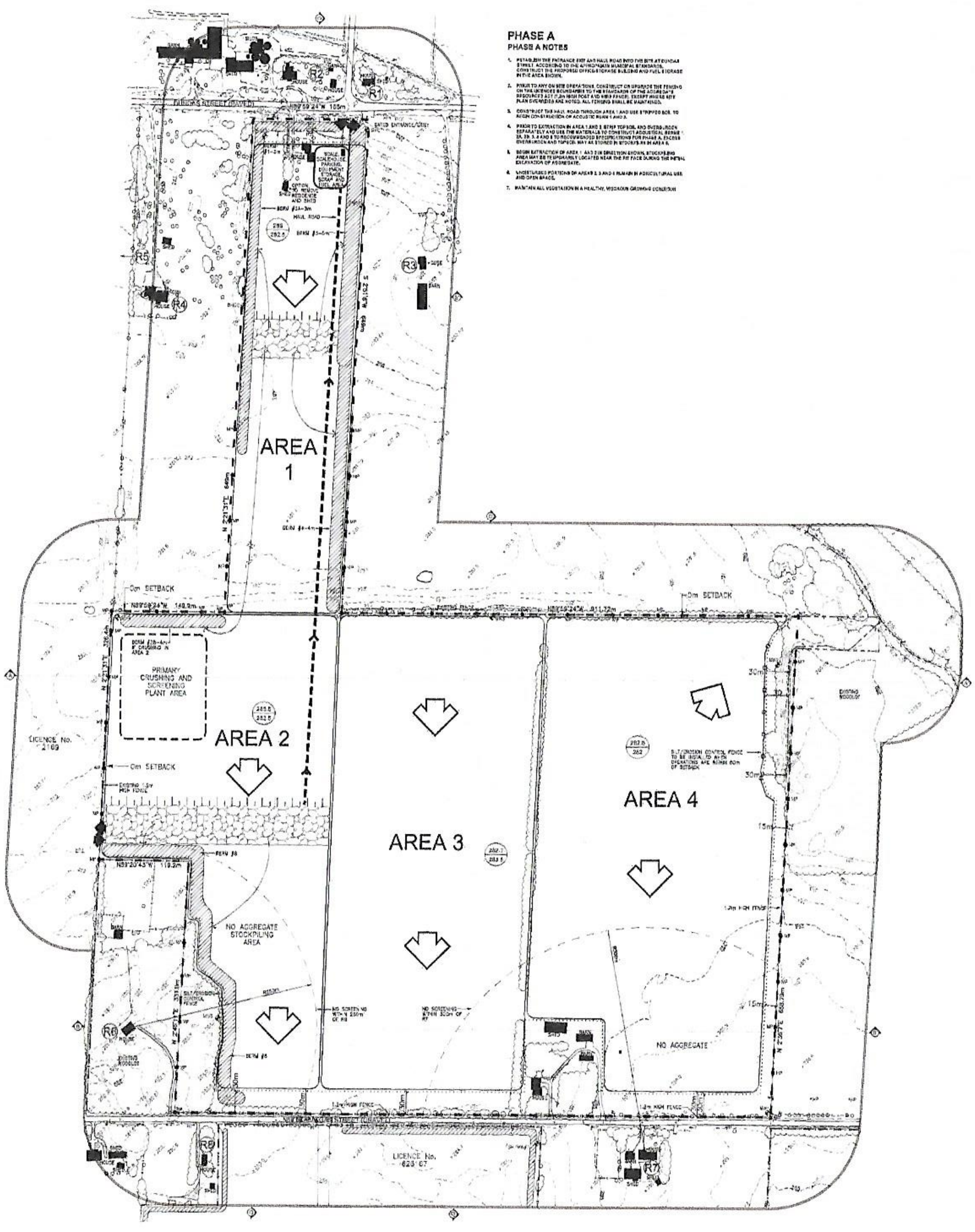


Figure 3

Existing Traffic (Adjusted)



PHASE A

PHASE A NOTES

1. ESTABLISH THE ENTRANCE EXIT AND HAUL ROAD INTO THE SITE AT DUNDAS STREET, ACCORDING TO THE APPROPRIATE MUNICIPAL STANDARDS. CONSTRUCT THE PROPOSED OFFICE/STORAGE BUILDING AND FUEL STORAGE IN THE AREA SHOWN.
2. PRIOR TO ANY ON SITE OPERATIONS, CONSTRUCT OR UPGRADE THE FENCING ON THE LICENCE BOUNDARIES TO THE STANDARDS OF THE AGGREGATE RESOURCES ACT (1.2m HIGH POST AND WIRE FENCE), EXCEPT WHERE SITE PLAN OVERRIDES ARE NOTED. ALL FENCING SHALL BE MAINTAINED.
3. CONSTRUCT THE HAUL ROAD THROUGH AREA 1 AND USE STRIPPED SOIL TO BEGIN CONSTRUCTION OF ACOUSTIC BERM 1 AND 2.
4. PRIOR TO EXTRACTION IN AREA 1 AND 2, STRIP TOPSOIL AND OVERBURDEN SEPARATELY AND USE THE MATERIALS TO CONSTRUCT ACOUSTICAL BERMS 1, 2A, 2B, 3, 4 AND 5 TO RECOMMENDED SPECIFICATIONS FOR PHASE A. EXCESS OVERBURDEN AND TOPSOIL MAY BE STORED IN STOCKPILES IN AREA 6.
5. BEGIN EXTRACTION OF AREA 1 AND 2 IN DIRECTION SHOWN. STOCKPILING AREA MAY BE TEMPORARILY LOCATED NEAR THE PIT FACE DURING THE INITIAL EXCAVATION OF AGGREGATE.
6. UNDISTURBED PORTIONS OF AREAS 2, 3 AND 4 REMAIN IN AGRICULTURAL USE AND OPEN SPACE.
7. MAINTAIN ALL VEGETATION IN A HEALTHY, VIGOROUS GROWING CONDITION

OPERATIONS NOTES

GENERAL INFORMATION

EXTRACTION/PROCESSING/HAULING INFORMATION

AGGREGATE RECYCLING

HYDROGEOLOGICAL INFORMATION

NOISE MITIGATION INFORMATION

AIR QUALITY INFORMATION

SITE MANAGEMENT INFORMATION

LEGEND

SITE PLAN OVERRIDE (VARIANCE)

Harrington McAvan Ltd

Project Name

AAROC AGGREGATES

PAYNE PIT

LICENCE No. ——

APPLICANT'S SIGNATURE ____________

PART LOTS 16 AND 17 CONCESSION 1 NTR
MUNICIPALITY OF THAMES CENTRE
(FORMERLY NORTH DORCHESTER), COUNTY OF MIDDLESEX

Scale 1:2000	North	Stamp
Drawing Status: PRELIMINARY FOR DISCUSSION		
Drawn SB	Checked BJ	Issue Date FEB 2021
Drawing Title: OPERATIONAL PLAN		Project Number 18-38
		Drawing Number 2 OF 5

Figure 4

Site Plan

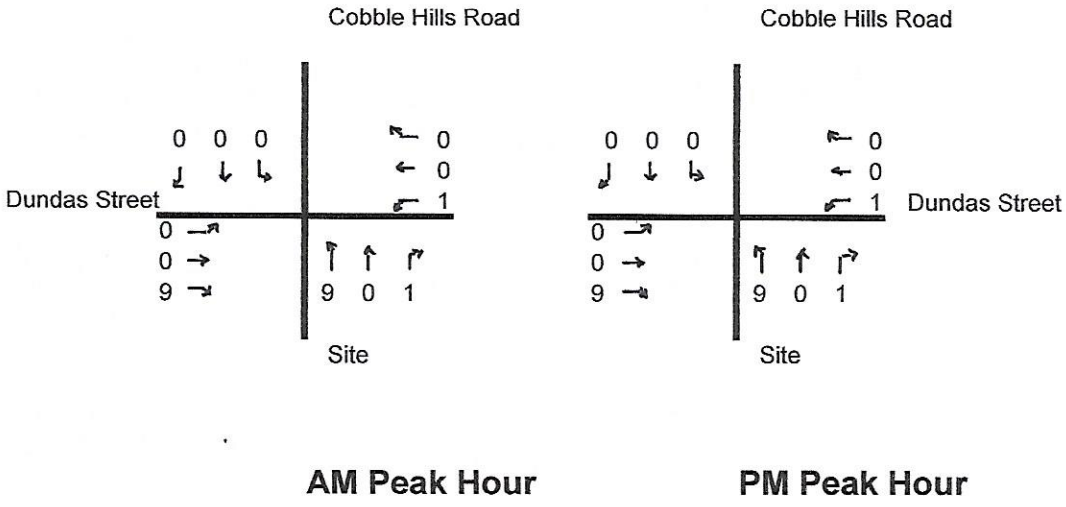


Figure 5

Site Generated Traffic

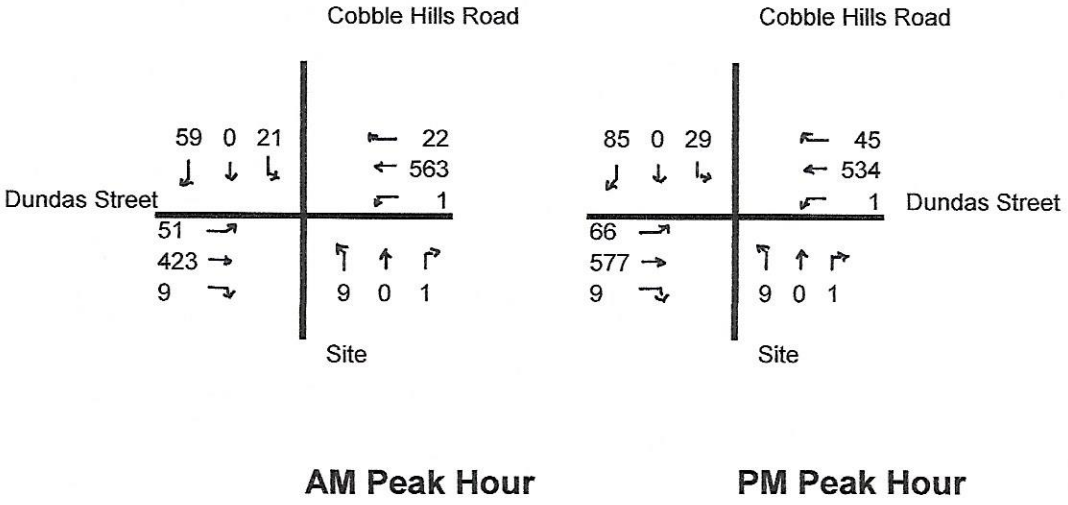


Figure 6

Total Traffic 2027

Intersection	AM Peak Hour				PM Peak Hour			
	v/c	Del.	LofS	Q	v/c	Del.	LofS	Q
Total Traffic 2027								
Eastbound L	0.059	9.0	A	0.2	0.075	9.1	A	0.2
Eastbound TR	-	1.0	A	-	-	0.9	A	-
Westbound LTR	0.001	10.0	A	0.0	0.002	10.9	B	0.0
Northbound LTR	0.122	51.0	F	0.4	0.187	80.9	F	0.6
Southbound LTR	0.281	21.2	C	1.1	0.464	29.6	D	2.3
Ave. Intersec'n Delay		2.3sec				3.5sec		
LofS		A				A		

Note: Del. - ave. delay (secs.)

LofS - level of service

v/c - volume to capacity ratio

Average Intersection Delay (secs.)

Q - maximum queue length (vehicles)

(95th percentile)

Table 1

Level of Service
Dundas Street and
Site Access/
Cobble Hills Road

APPENDIX A

TRAFFIC COUNTS

Dundas St (CR 2) @ Cobble Hills Rd

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

Municipality: Thames Centre
Site #: 0000000001
Intersection: Dundas St & Cobble Hills Rd
TFR File #: 3
Count date: 24-Feb-2021

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Matt

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 111
North Entering: 58
North Peds: 0
Peds Cross: ⋈

Heavys	8	2	10
Trucks	0	1	1
Cars	35	12	47
Totals	43	15	

Heavys	2
Trucks	2
Cars	49
Totals	53

East Leg Total: 744
East Entering: 423
East Peds: 0
Peds Cross: ⧖

Cobble Hills Rd

Heavys	Trucks	Cars	Totals
54	8	388	450

Dundas St

Heavys	Trucks	Cars	Totals
2	2	33	37
45	10	251	306
47	12	284	

N
W E
S

Cars	Trucks	Heavys	Totals
16	0	0	16
353	8	46	407
369	8	46	

Dundas St

Cars	Trucks	Heavys	Totals
263	11	47	321

Peds Cross: ⧖
West Peds: 0
West Entering: 343
West Leg Total: 793

Comments

Dundas St (CR 2) @ Cobble Hills Rd

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

Municipality: Thames Centre
Site #: 0000000001
Intersection: Dundas St & Cobble Hills Rd
TFR File #: 3
Count date: 24-Feb-2021

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Matt

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 74
North Entering: 38
North Peds: 0
Peds Cross: ⋈

Heavys	4	1	5
Trucks	2	1	3
Cars	23	7	30
Totals	29	9	

Heavys	2
Trucks	1
Cars	33
Totals	36

East Leg Total: 604
East Entering: 292
East Peds: 0
Peds Cross: ⧖

Cobble Hills Rd

Heavys	Trucks	Cars	Totals
50	9	252	311

	Cars	Trucks	Heavys	Totals
	10	0	0	10
	229	7	46	282
	239	7	46	

Dundas St

N
W E
S

Heavys	Trucks	Cars	Totals
2	1	23	26
41	16	246	303
43	17	269	

Dundas St

	Cars	Trucks	Heavys	Totals
	253	17	42	312

Peds Cross: ⧖
West Peds: 0
West Entering: 329
West Leg Total: 640

Comments

Dundas St (CR 2) @ Cobble Hills Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:00:00
To: 17:00:00

Municipality: Thames Centre
Site #: 0000000001
Intersection: Dundas St & Cobble Hills Rd
TFR File #: 3
Count date: 24-Feb-2021

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Matt

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 169
North Entering: 86
North Peds: 1
Peds Cross: ⋈

Heavys	4	1	5
Trucks	2	0	2
Cars	58	21	79
Totals	64	22	

Heavys	14
Trucks	5
Cars	64
Totals	83

East Leg Total: 885
East Entering: 432
East Peds: 0
Peds Cross: ⋈

Cobble Hills Rd

Heavys	Trucks	Cars	Totals
46	11	405	462

Cars	Trucks	Heavys	Totals
24	4	6	34
347	9	42	398
371	13	48	

Dundas St

N
W E
S

Heavys	Trucks	Cars	Totals
8	1	40	49
30	8	393	431
38	9	433	

Dundas St

Cars	Trucks	Heavys	Totals
414	8	31	453

Peds Cross: ⋈
West Peds: 0
West Entering: 480
West Leg Total: 942

Comments

Dundas St (CR 2) @ Cobble Hills Rd

Total Count Diagram

Municipality: Thames Centre
Site #: 0000000001
Intersection: Dundas St & Cobble Hills Rd
TFR File #: 3
Count date: 24-Feb-2021

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Matt

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 808
North Entering: 430
North Peds: 1
Peds Cross: ⋈

Heavys	33	10	43
Trucks	10	9	19
Cars	251	117	368
Totals	294	136	

Heavys	33
Trucks	20
Cars	325
Totals	378

East Leg Total: 5267
East Entering: 2611
East Peds: 0
Peds Cross: ⋈

Cobble Hills Rd

Heavys	Trucks	Cars	Totals
364	85	2337	2786

	Cars	Trucks	Heavys	Totals
	101	7	11	119
	2086	75	331	2492
	2187	82	342	

Dundas St

N
W E
S

Heavys	Trucks	Cars	Totals
22	13	224	259
333	81	2106	2520
355	94	2330	

Dundas St

Cars	Trucks	Heavys	Totals
2223	90	343	2656

Peds Cross: ⋈
West Peds: 1
West Entering: 2779
West Leg Total: 5565

Comments

Dundas St (CR 2) @ Cobble Hills Rd

Municipality: Thames Centre
Major Road: Dundas St
Minor Road: Cobble Hills Rd

Date: Feb 24, 2021

Major Road Runs: East/West
Weather Conditions: Cloudy/Dry
Person No. 1 Matt
Person No. 2

Period Ending	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	1	0	6	1	0	2	0	0	74	1	0	6	2	0	0	0	0	0	0	0	0	5	58	0	2	15	0	0	173	
7:30	2	0	11	0	0	3	0	0	105	2	0	13	0	0	0	0	0	0	0	0	0	8	62	0	1	14	0	0	221	
7:45	5	0	7	1	0	0	0	0	88	5	0	17	0	0	0	0	0	0	0	0	0	10	65	0	2	10	0	0	210	
8:00	4	0	6	0	0	3	0	0	99	4	0	13	0	0	0	0	0	0	0	0	0	15	56	0	0	16	0	0	216	820
8:15	1	0	11	2	0	2	0	0	61	5	0	11	0	0	0	0	0	0	0	0	0	0	68	0	1	15	0	0	177	824
8:30	3	0	7	0	0	2	0	0	66	3	0	14	0	0	0	0	0	0	0	0	0	8	45	0	0	16	0	0	164	767
8:45	3	0	10	1	0	0	0	0	52	2	0	15	0	0	0	0	0	0	0	0	0	6	44	0	1	9	0	0	143	700
9:00	4	0	4	0	0	0	0	0	57	3	0	16	2	0	0	0	0	0	0	0	0	2	40	0	1	16	0	0	145	629
11:15	1	0	3	1	0	2	0	0	45	1	0	13	0	0	0	0	0	0	0	0	0	7	35	0	2	23	0	0	133	
11:30	1	0	6	1	0	1	0	0	53	2	0	13	0	0	0	0	0	0	0	0	0	3	39	0	1	14	0	0	134	
11:45	0	0	3	1	0	4	0	0	42	1	0	22	0	0	0	0	0	0	0	0	0	2	58	0	0	19	0	0	152	
12:00	5	0	5	3	0	0	0	0	37	2	0	13	1	0	0	0	0	0	0	0	0	3	37	0	0	13	0	0	119	538
12:15	3	0	4	0	0	1	0	0	50	2	0	14	1	0	0	0	0	0	0	0	0	12	49	0	3	20	0	0	159	564
12:30	4	0	9	0	0	0	0	0	60	0	0	12	0	0	0	0	0	0	0	0	0	8	54	0	3	11	0	0	161	591
12:45	1	0	6	1	0	1	0	0	52	3	0	17	0	0	0	0	0	0	0	0	0	2	46	0	1	14	0	0	144	583
13:00	7	0	3	1	0	1	0	0	45	2	0	19	0	0	0	0	0	0	0	0	0	3	60	0	1	20	0	0	162	626
13:15	1	0	6	1	0	0	0	0	51	4	0	18	0	0	0	0	0	0	0	0	0	1	53	0	1	10	0	0	146	613
13:30	2	0	1	0	0	0	0	0	63	2	0	11	0	0	0	0	0	0	0	0	0	4	67	0	1	17	0	0	168	620
13:45	2	0	7	1	0	1	0	0	56	2	0	12	0	0	0	0	0	0	0	0	0	6	64	0	1	19	0	0	171	647
14:00	2	0	9	0	0	5	0	0	59	2	0	12	0	0	0	0	0	0	0	0	0	12	62	0	0	11	0	0	174	659
15:15	7	0	3	0	0	3	0	0	59	5	0	16	0	0	0	0	0	0	0	0	0	5	74	0	0	12	0	0	184	
15:30	2	0	9	1	0	0	0	0	65	3	0	18	0	0	0	0	0	0	0	0	0	7	100	0	1	14	0	1	220	
15:45	3	0	8	0	0	1	0	0	84	3	0	13	0	0	0	0	0	0	0	0	0	10	69	0	1	11	0	0	203	
16:00	8	0	9	0	0	2	0	0	67	5	0	5	2	0	0	0	0	0	0	0	0	10	84	0	1	8	0	0	201	808
16:15	2	0	15	0	0	1	0	0	80	5	0	9	5	0	0	0	0	0	0	0	0	10	82	0	0	10	0	0	219	843
16:30	6	0	12	0	0	1	0	0	84	8	0	22	3	0	0	0	0	0	0	0	0	11	103	0	5	9	0	0	264	887
16:45	6	0	15	0	0	0	0	0	93	6	0	7	2	0	0	0	0	0	0	0	0	11	96	0	4	8	0	0	248	932
17:00	7	0	16	1	0	4	1	0	90	5	0	13	0	0	0	0	0	0	0	0	0	8	112	0	0	11	0	0	267	998
17:15	6	0	9	0	0	0	0	0	67	5	0	4	0	0	0	0	0	0	0	0	0	7	83	0	0	9	0	0	190	969
17:30	6	0	11	0	0	2	0	0	82	3	0	6	0	0	0	0	0	0	0	0	0	5	93	0	0	6	0	0	214	919
17:45	9	0	9	2	0	0	0	0	62	1	0	4	0	0	0	0	0	0	0	0	0	9	83	0	1	4	0	0	184	855
18:00	3	0	11	0	0	1	0	0	38	4	0	8	0	0	0	0	0	0	0	0	0	14	65	0	0	10	0	0	154	742

Hunt Rd @ Dundas St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:00:00
To: 8:00:00

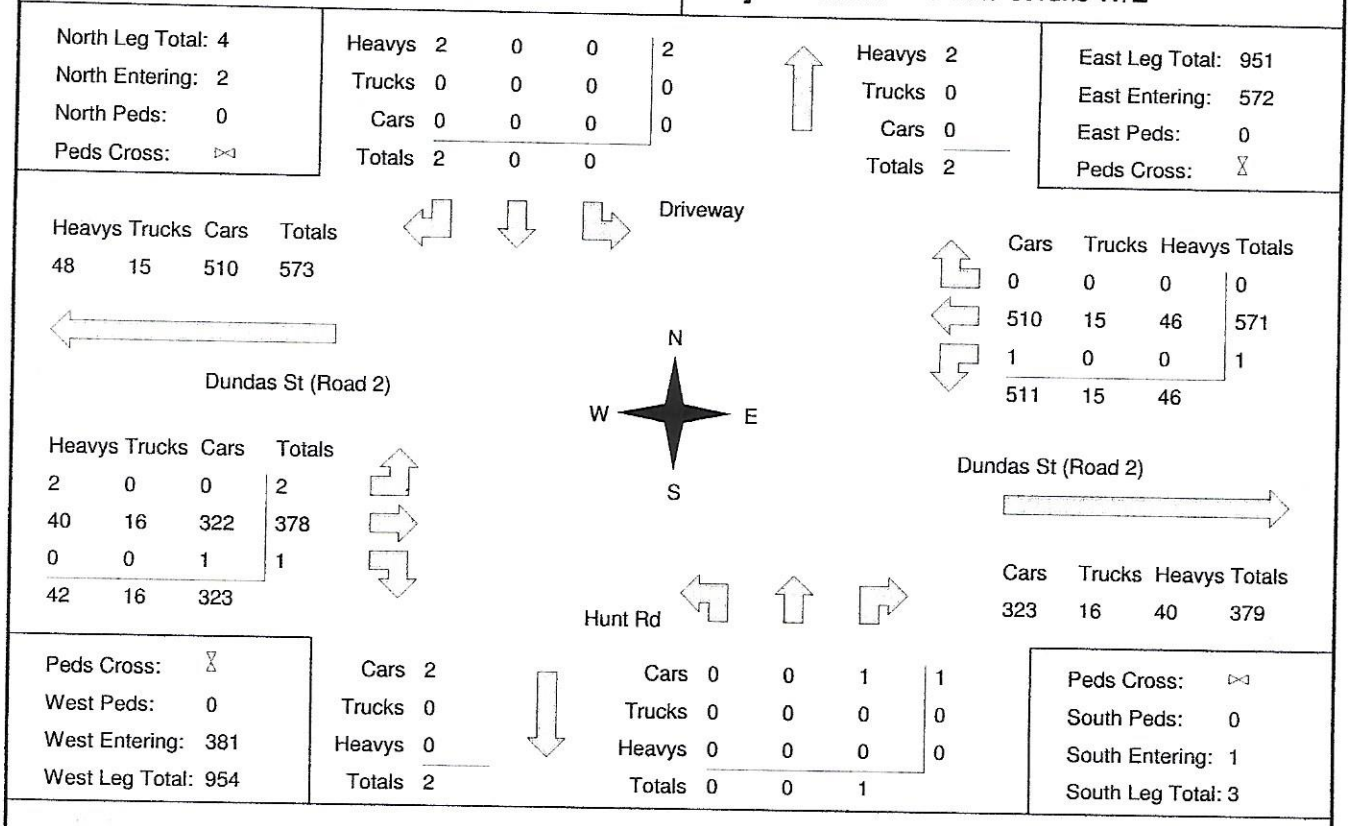
Municipality: Thames Centre
Site #: 0000000013
Intersection: Dundas St & Hunt Rd
TFR File #: 3
Count date: 21-Sep-2016

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E



Comments

Hunt Rd @ Dundas St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Thames Centre
Site #: 0000000013
Intersection: Dundas St & Hunt Rd
TFR File #: 3
Count date: 21-Sep-2016

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 8
North Entering: 4
North Peds: 0
Peds Cross: ⋈

Heavys	3	0	0	3
Trucks	0	0	0	0
Cars	0	0	1	1
Totals	3	0	1	

Heavys	3
Trucks	0
Cars	1
Totals	4

East Leg Total: 620
East Entering: 305
East Peds: 0
Peds Cross: ⋈

Heavys	Trucks	Cars	Totals
55	22	230	307

Driveway

	Cars	Trucks	Heavys	Totals
	1	0	0	1
	230	22	52	304
	0	0	0	0
	231	22	52	

Dundas St (Road 2)

N
W E
S

Heavys	Trucks	Cars	Totals
3	0	0	3
50	26	233	309
0	0	0	0
53	26	233	

Dundas St (Road 2)

Cars	Trucks	Heavys	Totals
235	26	54	315

Hunt Rd

Peds Cross: ⋈
West Peds: 0
West Entering: 312
West Leg Total: 619

Cars	0	0	1	1
Trucks	0	0	0	0
Heavys	0	0	4	4
Totals	0	0	5	

Cars	0
Trucks	0
Heavys	0
Totals	0

Peds Cross: ⋈
South Peds: 0
South Entering: 5
South Leg Total: 5

Comments

Hunt Rd @ Dundas St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Thames Centre
Site #: 0000000013
Intersection: Dundas St & Hunt Rd
TFR File #: 3
Count date: 21-Sep-2016

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 4
North Entering: 2
North Peds: 0
Peds Cross: ⋈

Heavys	2	0	0	2
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	2	0	0	

Heavys	2
Trucks	0
Cars	0
Totals	2

East Leg Total: 1015
East Entering: 439
East Peds: 0
Peds Cross: ⋈

Heavys	Trucks	Cars	Totals
38	19	382	439

Driveway

Dundas St (Road 2)

Cars	Trucks	Heavys	Totals
0	0	1	1
382	18	36	436
2	0	0	2
384	18	37	

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	0	1
36	10	529	575
0	2	1	3
37	12	530	

Dundas St (Road 2)

Cars	Trucks	Heavys	Totals
530	10	36	576

Hunt Rd

Peds Cross: ⋈
West Peds: 0
West Entering: 579
West Leg Total: 1018

Cars	3			
Trucks	2			
Heavys	0			
Totals	5			

Cars	0	0	1	1
Trucks	1	0	0	1
Heavys	0	0	0	0
Totals	1	0	1	

Peds Cross: ⋈
South Peds: 0
South Entering: 2
South Leg Total: 7

Comments

Hunt Rd @ Dundas St

Total Count Diagram

Municipality: Thames Centre
Site #: 0000000013
Intersection: Dundas St & Hunt Rd
TFR File #: 3
Count date: 21-Sep-2016

Weather conditions: Clear/Dry
Person(s) who counted: Diane

**** Non-Signalized Intersection ****

Major Road: Dundas St runs W/E

North Leg Total: 34
North Entering: 17
North Peds: 0
Peds Cross: ⋈

Heavys	14	0	0	14
Trucks	0	0	0	0
Cars	0	1	2	3
Totals	14	1	2	

Heavys	15
Trucks	0
Cars	2
Totals	17

East Leg Total: 6116
East Entering: 3069
East Peds: 0
Peds Cross: ⋈

Heavys	Trucks	Cars	Totals
343	134	2595	3072

Driveway

Cars	Trucks	Heavys	Totals
1	0	2	3
2592	133	328	3053
11	1	1	13
2604	134	331	

Dundas St (Road 2)

N
W E
S

Heavys	Trucks	Cars	Totals
13	0	1	14
356	133	2533	3022
0	2	5	7
369	135	2539	

Dundas St (Road 2)

Cars	Trucks	Heavys	Totals
2549	138	360	3047

Hunt Rd

Peds Cross: ⋈
West Peds: 0
West Entering: 3043
West Leg Total: 6115

Cars	17
Trucks	3
Heavys	1
Totals	21

Cars	3	0	14	17
Trucks	1	0	5	6
Heavys	1	0	4	5
Totals	5	0	23	

Peds Cross: ⋈
South Peds: 0
South Entering: 28
South Leg Total: 49

Comments

Hunt Rd @ Dundas St

Municipality: Thames Centre
Major Road: Dundas St
Minor Road: Hunt Rd

Date: Sep 21, 2016

Major Road Runs: East/West
Weather Conditions: Clear/Dry
Person No. 1 Diane
Person No. 2

Period Ending	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	0	0	0	0	0	1	0	1	95	0	0	8	0	0	0	0	0	0	0	0	0	0	66	0	0	15	0	0	186	
7:30	0	0	0	0	0	0	0	0	139	0	0	14	0	0	0	0	0	0	0	0	0	0	93	0	1	9	0	0	256	
7:45	0	0	0	0	0	1	0	0	146	0	0	22	0	0	0	0	1	0	0	0	0	0	84	1	0	14	0	0	269	
8:00	0	0	0	0	0	0	0	0	130	0	0	17	0	0	0	0	0	0	0	0	0	0	79	0	1	18	0	0	245	956
8:15	0	0	0	0	0	1	0	1	95	0	0	9	0	0	0	0	1	0	0	0	0	0	60	0	1	13	0	0	181	951
8:30	0	0	0	0	0	1	0	1	104	0	0	11	0	0	0	0	2	0	0	0	0	0	64	0	0	27	0	0	210	905
8:45	0	0	0	0	0	0	0	1	86	0	0	6	0	0	0	0	0	0	0	0	0	0	67	0	1	25	0	0	186	822
9:00	0	0	0	0	0	1	0	0	80	0	0	17	0	0	0	0	0	0	0	0	0	1	44	0	0	24	0	0	167	744
11:15	0	0	0	0	0	1	0	0	46	0	0	15	0	0	0	0	0	0	0	1	0	0	52	0	1	16	0	0	132	
11:30	0	0	0	0	0	0	0	0	68	0	0	23	0	0	0	0	0	0	0	0	0	0	47	1	0	23	0	0	162	
11:45	0	0	0	0	0	0	0	0	61	0	0	20	0	0	0	0	0	0	0	0	0	0	54	0	0	11	0	0	146	
12:00	0	0	0	0	0	0	0	0	44	0	0	15	0	0	0	0	0	0	0	0	0	0	48	0	0	11	0	0	118	558
12:15	1	0	0	0	0	0	0	0	50	0	0	18	0	0	0	0	0	0	0	0	0	0	60	0	0	13	0	0	142	568
12:30	0	0	0	0	0	0	0	0	64	1	0	12	0	0	0	0	0	0	0	0	0	0	64	0	3	26	0	0	170	576
12:45	0	0	0	0	0	1	0	0	55	0	0	21	0	0	0	0	0	0	0	0	0	0	54	0	0	17	0	0	148	578
13:00	0	0	0	0	0	2	0	0	61	0	0	23	0	0	0	0	1	0	0	4	0	0	55	0	0	20	0	0	166	626
13:15	0	0	0	0	0	0	0	0	48	0	0	20	0	0	0	0	3	0	0	1	0	0	55	0	0	14	0	0	141	625
13:30	0	0	0	0	0	0	0	1	54	0	0	16	0	0	0	0	0	0	0	0	0	0	61	0	0	20	0	0	152	607
13:45	0	0	0	0	0	0	0	0	50	0	0	14	0	0	0	0	2	0	0	1	0	0	57	0	0	21	0	0	145	604
14:00	0	0	0	0	0	0	0	0	58	0	1	10	0	0	0	0	0	0	0	0	0	0	62	0	2	13	0	0	146	584
15:15	0	1	0	0	0	0	0	0	91	0	0	14	0	0	0	0	0	0	0	2	0	0	73	0	1	6	0	0	188	
15:30	0	0	0	0	0	2	0	0	79	0	0	19	1	0	1	0	0	0	0	0	0	0	94	0	0	14	0	0	210	
15:45	0	0	0	0	0	0	0	1	103	0	1	6	0	0	0	0	0	0	0	0	0	0	101	1	0	18	0	0	231	
16:00	0	0	0	0	0	1	0	0	97	0	0	15	0	0	1	0	0	0	0	0	0	0	86	0	1	10	0	0	211	840
16:15	0	0	0	0	0	0	0	1	71	0	0	13	0	0	1	0	0	0	0	0	0	0	88	0	0	10	0	0	184	836
16:30	0	0	0	0	0	0	0	0	103	0	0	15	0	0	0	0	1	0	0	0	0	0	128	1	1	13	1	0	263	889
16:45	0	0	0	0	0	1	0	1	96	0	0	14	1	0	0	0	0	1	0	0	0	0	138	0	0	12	1	0	265	923
17:00	0	0	0	0	0	1	0	0	100	0	0	16	0	0	0	0	0	0	0	0	0	0	134	0	0	10	0	0	261	973
17:15	0	0	0	0	0	0	0	1	83	0	0	9	0	0	0	0	0	0	0	0	0	0	129	0	0	11	0	0	233	1022
17:30	1	0	0	0	0	0	0	0	92	0	0	12	0	0	0	0	2	0	0	0	0	0	145	0	0	10	0	0	262	1021
17:45	0	0	0	0	0	0	0	1	65	0	0	12	0	0	0	0	0	1	0	0	0	0	99	0	0	14	0	0	192	948
18:00	0	0	0	0	0	0	0	1	78	0	0	5	0	0	0	0	1	0	0	0	0	0	92	1	0	11	0	0	189	876

APPENDIX B

LEFT TURN LANE REQUIREMENTS

Left Turn Lane Requirements

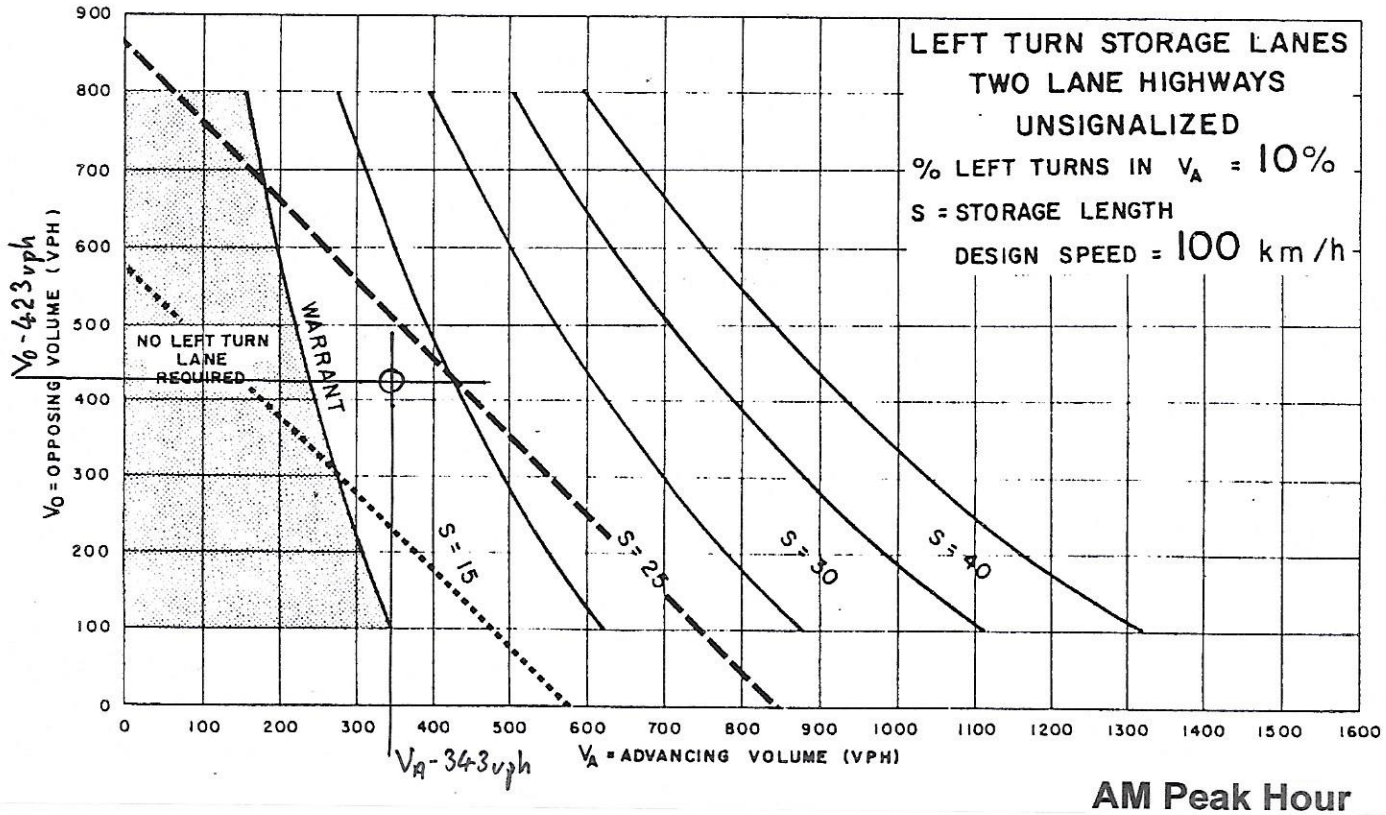
Dundas Street at Cobble Hills Road Eastbound

Design Speed 100km/h

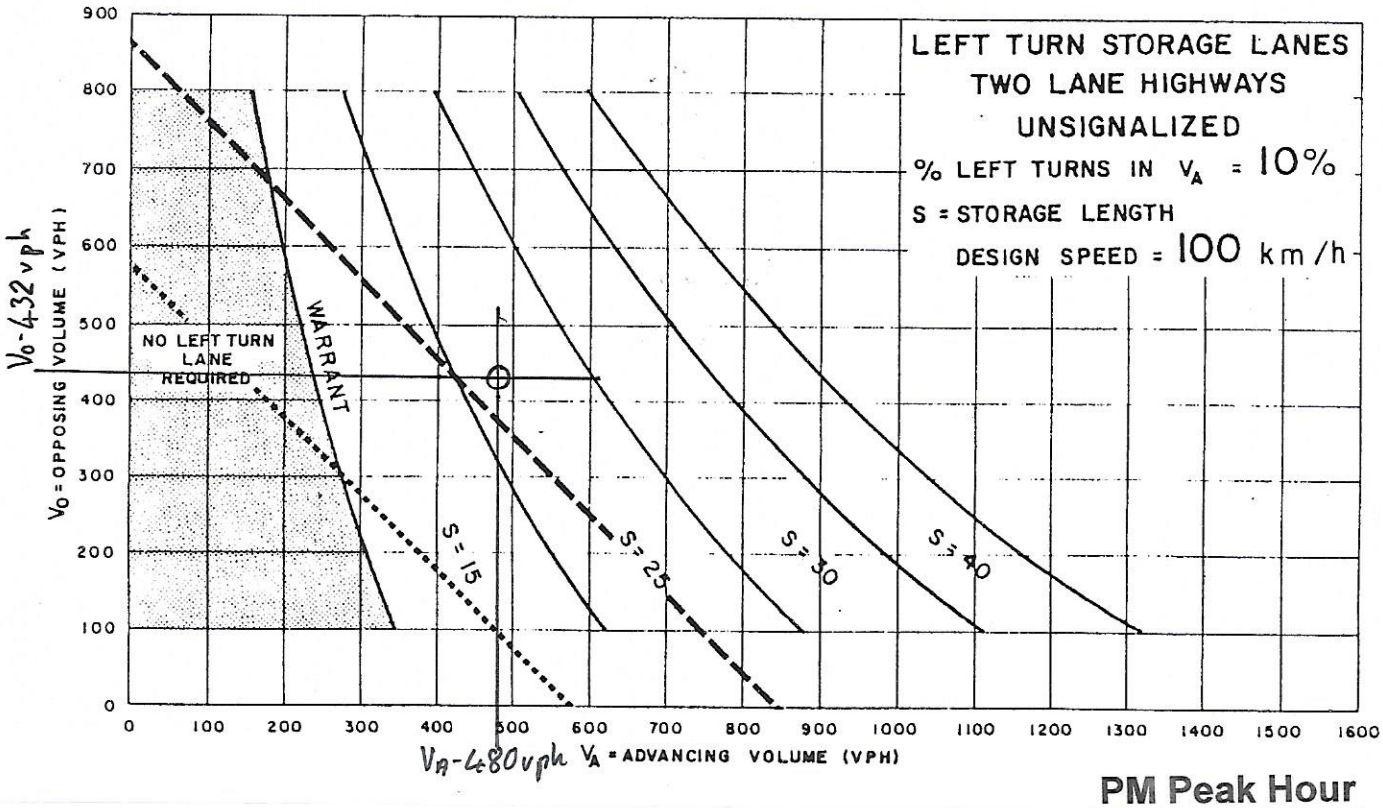
Actual Count, February 2021

AM Peak Hour
Percent left - 37/343 - 10.8% - use 10 percent
Va - 343vph Vo - 423vph S - 15 metres

PM Peak Hour
Percent left - 49/480 - 10.2% - use 10 percent
Va - 480vph Vo - 432vph S - 25 metres



AM Peak Hour



PM Peak Hour

APPENDIX C

SIGHT DISTANCE REQUIREMENTS

A - Minimum Stopping Sight Distance, Table E3-1.
A_1 - Distance travelled in 3 s, Table E3-2.
B - Safe Sight Distance for P vehicle, crossing 2-lane highway from stop.
C - Safe Sight Distance for P vehicle, turning left into 2-lane highway across P vehicle approaching from left.
D - Safe Sight Distance for P vehicle to turn left into 2-lane highway and attain assumed operating speed before being overtaken by P vehicle approaching in same direction at design speed.
E - Safe Sight Distance for P vehicle to turn right into 2-lane highway and attain assumed operating speed before being overtaken by P vehicle approaching in same direction at design speed.

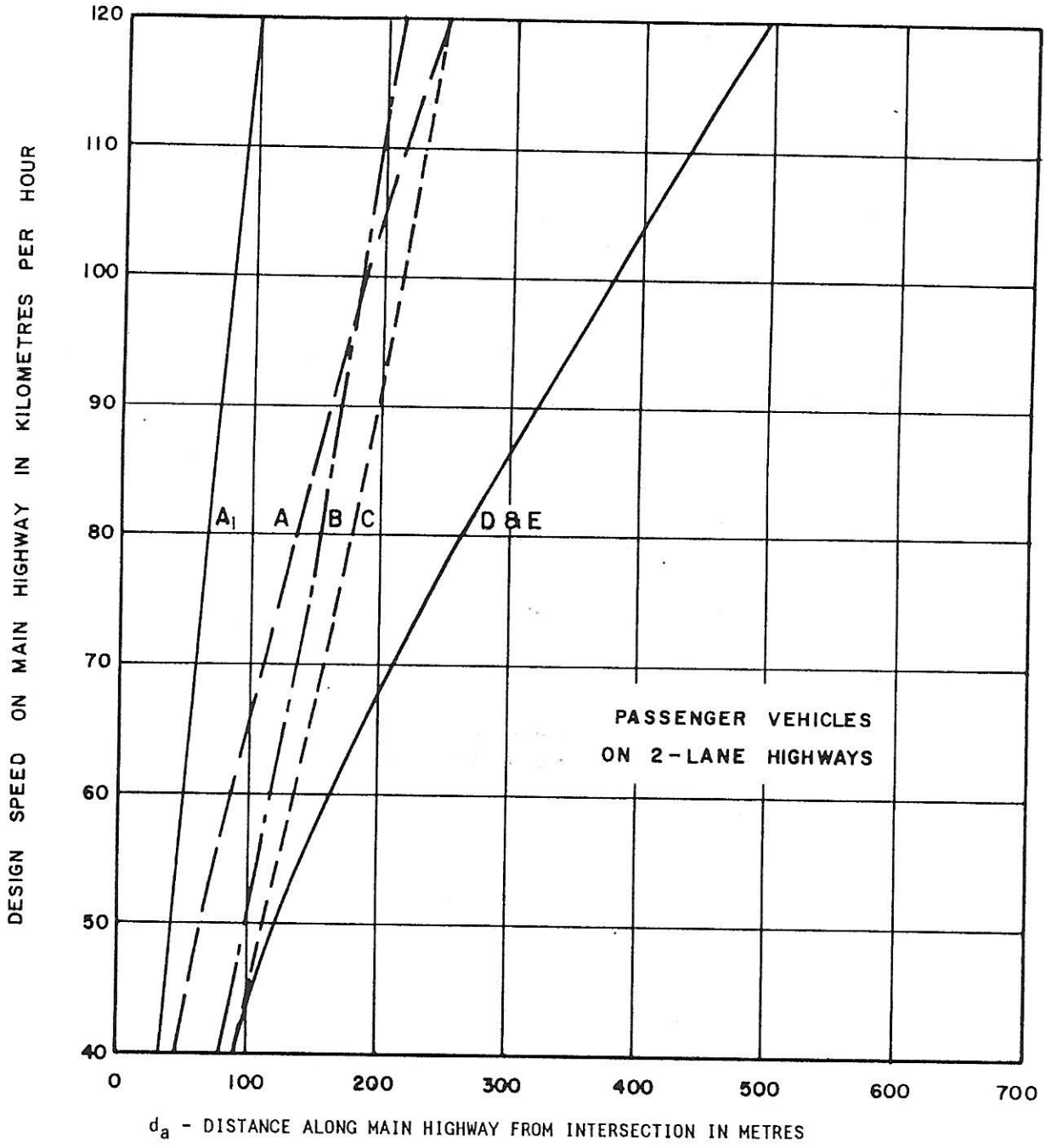


Figure E3-6

Sight Distance Requirements for Stopping, Crossing and Turning Movements

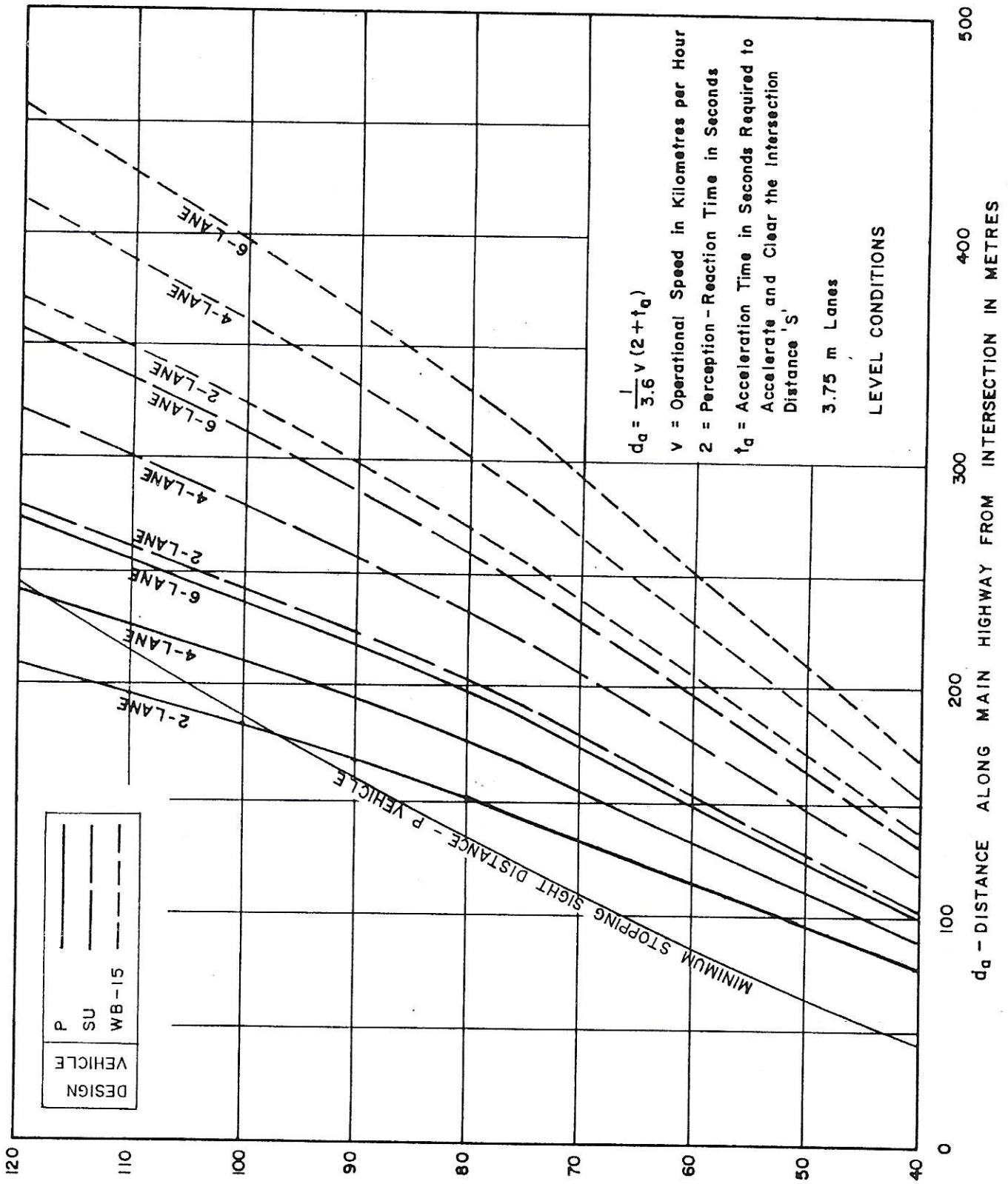


Figure E3-5

Sight Distance Requirements for Crossing Movements from Stop Condition

APPENDIX D

LEVEL OF SERVICE ANALYSIS

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	423	9	1	563	22	9	0	1	21	0	59
Future Vol, veh/h	51	423	9	1	563	22	9	0	1	21	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	100	100	2	2	100	100	100	2	100	2
Mvmt Flow	55	460	10	1	612	24	10	0	1	23	0	64

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	636	0	0	470	0	0	1233	1213	465	1202	1206	624
Stage 1	-	-	-	-	-	-	575	575	-	626	626	-
Stage 2	-	-	-	-	-	-	658	638	-	576	580	-
Critical Hdwy	4.12	-	-	5.1	-	-	8.1	7.5	7.2	7.12	7.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	6.12	6.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	6.12	6.5	-
Follow-up Hdwy	2.218	-	-	3.1	-	-	4.4	4.9	4.2	3.518	4.9	3.318
Pot Cap-1 Maneuver	947	-	-	726	-	-	99	120	438	161	121	485
Stage 1	-	-	-	-	-	-	366	375	-	472	353	-
Stage 2	-	-	-	-	-	-	325	347	-	503	373	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	726	-	-	82	113	438	153	114	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	82	113	-	153	114	-
Stage 1	-	-	-	-	-	-	345	353	-	445	352	-
Stage 2	-	-	-	-	-	-	281	346	-	473	351	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	51	21.2
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	89	947	-	-	726	-	-	309
HCM Lane V/C Ratio	0.122	0.059	-	-	0.001	-	-	0.281
HCM Control Delay (s)	51	9	-	-	10	0	-	21.2
HCM Lane LOS	F	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1.1

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	577	9	1	534	45	9	0	1	29	0	85
Future Vol, veh/h	66	577	9	1	534	45	9	0	1	29	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	100	100	2	2	100	100	100	2	100	2
Mvmt Flow	72	627	10	1	580	49	10	0	1	32	0	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	629	0	0	637	0	0	1429	1407	632	1384	1388	605
Stage 1	-	-	-	-	-	-	776	776	-	607	607	-
Stage 2	-	-	-	-	-	-	653	631	-	777	781	-
Critical Hdwy	4.12	-	-	5.1	-	-	8.1	7.5	7.2	7.12	7.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	6.12	6.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	6.12	6.5	-
Follow-up Hdwy	2.218	-	-	3.1	-	-	4.4	4.9	4.2	3.518	4.9	3.318
Pot Cap-1 Maneuver	953	-	-	612	-	-	69	88	342	121	91	498
Stage 1	-	-	-	-	-	-	274	293	-	483	361	-
Stage 2	-	-	-	-	-	-	328	350	-	390	291	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	953	-	-	612	-	-	53	81	342	113	84	498
Mov Cap-2 Maneuver	-	-	-	-	-	-	53	81	-	113	84	-
Stage 1	-	-	-	-	-	-	253	271	-	446	360	-
Stage 2	-	-	-	-	-	-	266	349	-	359	269	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	80.9	29.6
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	58	953	-	-	612	-	-	267
HCM Lane V/C Ratio	0.187	0.075	-	-	0.002	-	-	0.464
HCM Control Delay (s)	80.9	9.1	-	-	10.9	0	-	29.6
HCM Lane LOS	F	A	-	-	B	A	-	D
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-	-	2.3