

17 November 2023
Project: 230387

Shawn Milloy
1476545 Ontario Inc.
270 Shoemaker Street
Kitchener ON N2E 3E1

Dear Mr. Milloy:

**RE: TRANSPORTATION IMPACT BRIEF, PROPOSED AGGREGATE PIT EXPANSION,
1951 WHISTLE BARE ROAD, NORTH DUMFRIES**

1476545 Ontario Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Brief (TIB) for a proposed aggregate pit expansion located at 1951 Whistle Bare Road in the Township of North Dumfries, Region of Waterloo. **Figure 1** (attached) illustrates the location of the subject development including the existing aggregate pit and proposed expansion.

Purpose and Scope

This report identifies and assesses the potential traffic impact resulting from the proposed aggregate pit expansion. The scope of the study includes:

- ▶ assessing the current traffic and site conditions within the study area;
- ▶ estimating background traffic growth for a one-year horizon (2024);
- ▶ estimating additional traffic generated by the subject site;
- ▶ analyzing the impact of future traffic on the surrounding road network, including the following intersections:
 - Whistle Bare Road and Dickie Settlement Road (unsignalized); and
 - Whistle Bare Road and the existing site access (unsignalized).
- ▶ recommending necessary measures to mitigate the site generated traffic in a satisfactory manner; and
- ▶ assessing the sight distance and stopping sight distance requirements.

This study has been prepared in accordance with the requirements detailed by the Region of Waterloo Traffic Impact Study Guidelines¹.

Existing Conditions

Existing Roadways

The main roadways near the subject site considered in assessing the traffic impacts of the development include:

- ▶ **Whistle Bare Road** is an east-west local road² with a two-lane cross section and an assumed speed limit of 80 km/h. No sidewalks or cycling facilities are provided along the roadway.
- ▶ **Dickie Settlement Road** is a north-south regional road with a two-lane cross section and a posted speed limit of 80 km/h. No sidewalks or cycling facilities are provided along the roadway.

Figure 2 (attached) illustrates the existing lane configuration and traffic control at the study area intersections.

Traffic Volumes

Paradigm collected turning movements counts at the existing access to 1951 Whistle Bare Road and the intersection of Whistle Bare Road and Dickie Settlement Road on 7 June 2023.

Table 1 summarizes the traffic count date and peak hour start times for each intersection.

TABLE 1 TRAFFIC DATA SUMMARY

Intersection	Count Date	AM Peak Hour	PM Peak Hour
Whistle Bare Road & Dickie Settlement Road	June 7, 2023	7:30 AM	3:45 PM
Whistle Bare Road & Site Access	June 7, 2023	9:15 AM	3:00 PM

Figure 3 (attached) illustrates the existing AM and PM weekday peak hour traffic volumes.

Appendix A contains the collected traffic counts for the study area intersections.

Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that

¹ Region of Waterloo, *Transportation Impact Study Guidelines*, 2014.

² The Township of North Dumfries, *Official Plan Map 3A Transportation*, November 2018.



movement. The capacity is based on several criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.0, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

The operations at the study area intersections have been assessed using Synchro 11. The criteria, as defined by the Region, for identifying “critical” intersections are:

- ▶ overall Level of Service E or F (i.e., average control delay per vehicle greater than 55 seconds) for signalized intersections; and
- ▶ overall Level of Service E or F (i.e., average control delay per vehicle greater than 35 seconds) for unsignalized intersections.
- ▶ As well, the criteria for identifying individual “critical” movements are:
 - the average control delay for individual movements is greater than 55 seconds;
 - estimated 95th percentile queue length for an exclusive movement exceeds the available storage space;
 - estimated 95th percentile queue length for an individual movement will block an existing access;
 - exclusive turning lanes are inaccessible because of queue lengths in adjacent through lanes; and
 - poor quality of service for non-auto modes.

Table 2 summarizes the results of the intersection operational analysis under existing conditions, including the AM and PM peak hour LOS, v/c ratios, and 95th percentile queues. The results indicate that the study area intersections are operating at acceptable levels of service, and with no problem movements.

Appendix B contains the detailed Synchro 11 reports.



TABLE 2: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Dickie Settlement Road & Whistle Bare Road	TWSC	LOS Delay V/C Q	< < <	B 14 0.04 1	> > >	B 14	< < <	C 20 0.08 2	> > >	C 20	< < <	A 9 0.00 0	> > >	A 0	< < <	A 9 0.03 1	> > >	A 1	
	Site Access & Whistle Bare Road	TWSC	LOS Delay V/C Q		A 0 0.00 0	> > >	A 0	< < <	A 7 0.00 0		A 1	A 9 0.01 0	> > >	A 9						
PM Peak Hour	Dickie Settlement Road & Whistle Bare Road	TWSC	LOS Delay V/C Q	< < <	C 23 0.14 4	> > >	C 23	< < <	C 24 0.24 7	> > >	C 24	< < <	A 8 0.01 0	> > >	A 0	< < <	A 10 0.03 1	> > >	A 0	
	Site Access & Whistle Bare Road	TWSC	LOS Delay V/C Q		A 0 0.00 0	> > >	A 0	< < <	A 8 0.00 0		A 0	A 9 0.01 0	> > >	A 9						

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

TWSC - Two-Way Stop Control

</> - Shared with through movement

Development Concept

Development Description

The subject site is located on the south side of Whistle Bare Road, approximately 1.5 km west of Dickie Settlement Road. The property owner is proposing to expand the existing aggregate pit extraction area easterly while maintaining the annual extraction rate and license limit of 100,000 tonnes per year.

Vehicle access is proposed via the existing access at 1951 Whistle Bare Road.

Figure 4 (attached) shows the concept plan of the proposed expansion.

Development Trip Generation

The trips generated by the aggregate operation were estimated for the AM and PM peak hours based on the following information related to the operations of the facility:

- **Licensed Extraction Rate:** The maximum amount of annual tonnage applied for in the aggregate license is 100,000 tonnes annually. This number represents the maximum amount of material that can be removed from the site on a yearly basis. For the purpose of this report, and to assess the maximum impacts, it is assumed that the allowed maximum of 100,000 tonnes will be extracted annually.



- **Pit Operations:** Based on information provided by the owner, trucks will be loaded between 6:00 AM to 5:00 PM for Monday to Friday. Daily shipping and receiving is expected between March to November for 40 weeks, resulting in 200 operating days per year.
- **Vehicle Size:** The traffic generated by the site is directly related to the payload of the vehicles being loaded. Based on the information provided by the owner, this pit is expected to see a combination of 70% trailer trucks with an average payload of 35 tonnes and 30% tri-axle trucks with an average payload of 22 tonnes. A weighted average of 31.1 tonnes per truck was used for the analysis.

Table 3 summarizes the estimated daily average and peak hour traffic generation at the aggregate pit. It is recognized that truck traffic in this operation is not spread uniformly through the day. Based on experience elsewhere, a peak hour factor (PHF) of 2 is used to convert the average hourly volume to the peak hour volume. This translates into 4 trucks entering and exiting the site during the morning and afternoon peak hours.

The peak hour truck volume was then converted to Passenger Car Equivalents (PCE) to determine the impact on the traffic operations of the local road network. A weighted average of 3.2 PCE/Truck was used to account for the types of truck expected at this site. The resulting PCE entering and exiting the local road network are 26 PCE per peak hour.

TABLE 3: TRIP GENERATION ESTIAMTES

Measure	Units	Input	Calculation
Annual Rate of Extraction	tonnes/year	100,000	
Operating Days per year	day/year	200	
Average Extraction per day	tonnes/day		500
Average Payload per truck	tonnes/truck	31.1	
Average Number of Trucks per day	trucks/day		16
Operating Hours per day	hours/day	11	
Average number of trucks per hour	trucks/hour		2
Peak Hour Factor	dimensionless	2	
Peak Hour Truck Volume	trucks/hour		4
Passsenger Car Equivalents per Truck	PCE/truck	3.2	
Peak Hour Entering Volume	PCE/hour		13
Peak Hour Exiting Volume	PCE/hour		13

Development Trip Distribution and Assignment

The trip distribution was determined based on existing travel patterns within the study area. **Table 4** displays the breakdown of trip distributions used in this study.



TABLE 4: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	Percentage
East via Whistle Bare Road	10%
North via Dickie Settlement Rd	45%
South via Dickie Settlement Rd	45%
Total	100%

Figure 5 (attached) illustrates the site-generated traffic volumes for the AM and PM peak hours.

Evaluation of Future Traffic Conditions

The assessment of future traffic conditions in this section includes estimates of future background and total traffic volumes, and the analyses for the 2024 horizon year.

Background Traffic Forecasts

To derive the generalized background traffic volumes, a growth rate of 2% was applied to the existing roadway traffic volumes.

Other Area Developments

Grower's Choice currently operates a wholesale landscape material business out of 1951 Whistle Bare Road. The owners intend to relocate this operation to the north side of Whistle Bare Road and operate from 1994 Whistle Bare Road. The owners do not intend to change the function or operation of the business. Rather, they wish to relocate it to the north side of the road to permit construction of the new facility.

Given that the site will not alter its basic operation after the relocation from the south side of Whistle Bare Road to the north side, traffic volumes generated by this business is expected to remain as today.

Background Traffic

Figure 6 (attached) illustrates the 2024 background traffic volumes, including road traffic growth and the reorientation of the existing traffic generated at 1951 Whistle Bare Road to 1994 Whistle Bare Road.

The 2024 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

Table 5 summarizes the results of the 2024 background traffic operations. The results indicate that the study area intersections are forecast to operate with acceptable levels of service during the AM and PM peak hours.

Appendix C contains the supporting detailed Synchro 11 reports.



TABLE 5: 2024 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	Overall
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	Dickie Settlement Road & Whistle Bare Road	TWSC	LOS Delay V/C Q	< < <	C 15 0.05 1	> > >	C 15	< < <	C 17 0.15 4	> > >	C 17	< < <	A 9 0.00 0	> > >	A 0	< < <	A 10 0.04 1	> > >	A 1		
	Site Access & Whistle Bare Road	TWSC	LOS Delay V/C Q		A 0 0.00 0	> > >	A 0	< < <	A 0 0.00 0		A 0	A 0 0.00 0		> > >	A 0						
	Whistle Bare Road & Grower's Choice Relocation	TWSC	LOS Delay V/C Q	< < <	A 8 0.00 0		A 2		A 0 0.00 0	> > >	A 0					A 9 0.01 0		> > >	A 9		
PM Peak Hour	Dickie Settlement Road & Whistle Bare Road	TWSC	LOS Delay V/C Q	< < <	C 24 0.15 4	> > >	C 24	< < <	C 19 0.20 5	> > >	C 19	< < <	A 8 0.01 0	> > >	A 0	< < <	A 10 0.03 1	> > >	A 0		
	Site Access & Whistle Bare Road	TWSC	LOS Delay V/C Q		A 0 0.00 0	> > >	A 0	< < <	A 0 0.00 0		A 0	A 0 0.00 0		> > >	A 0						
	Whistle Bare Road & Grower's Choice Relocation	TWSC	LOS Delay V/C Q	< < <	A 8 0.00 0		A 0		A 0 0.00 0	> > >	A 0					A 9 0.01 0		> > >	A 9		

MOE - Measure of Effectiveness

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Q - 95th Percentile Queue Length (m)

TWSC - Two-Way Stop Control

</> - Shared with through movement

Total Traffic Forecasts

Figure 7 (attached) illustrates the 2024 total traffic volumes, including trips generated by the proposed development.

The 2024 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

Table 6 summarizes the results of the 2024 total traffic operations. The results indicate that the study area intersections are forecast to operate with acceptable levels of service during the AM and PM peak hours.

Appendix D contains the supporting detailed Synchro 11 reports.



TABLE 6: 2024 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	Overall
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	Dickie Settlement Road & Whistle Bare Road	TWSC	LOS Delay V/C Q	< < <	C 15 0.08 2	> > >	C 15	< < <	C 17 0.15 4	> > >	C 17	< < <	A 9 0.01 0	> > >	A 0	< < <	A 10 0.04 1	> > >	A 1		
	Site Access & Whistle Bare Road	TWSC	LOS Delay V/C Q		A 0 0.00 0	> > >	A 0	< < <	A 7 0.01 0		A 4	A 8 0.01 0		> > >	A 8						
	Whistle Bare Road & Grower's Choice Relocation	TWSC	LOS Delay V/C Q	< < <	A 8 0.00 0		A 2		A 0 0.00 0	> > >	A 0					A 9 0.01 0		> > >	A 9		
PM Peak Hour	Dickie Settlement Road & Whistle Bare Road	TWSC	LOS Delay V/C Q	< < <	C 25 0.20 5	> > >	C 25	< < <	C 20 0.21 6	> > >	C 20	< < <	A 9 0.01 0	> > >	A 0	< < <	A 10 0.03 1	> > >	A 0		
	Site Access & Whistle Bare Road	TWSC	LOS Delay V/C Q		A 0 0.00 0	> > >	A 0	< < <	A 7 0.01 0		A 3	A 8 0.01 0		> > >	A 8						
	Whistle Bare Road & Grower's Choice Relocation	TWSC	LOS Delay V/C Q	< < <	A 8 0.00 0		A 0		A 0 0.00 0	> > >	A 0					A 9 0.01 0		> > >	A 9		

MOE - Measure of Effectiveness

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Remedial Measures

Auxiliary Turning Lanes

The need for auxiliary turn lanes was reviewed at the intersection of Whistle Bare Road and the existing site access based on 2024 future total traffic forecasts.

Since the traffic volumes are forecast to be less than 100 vehicles per hour (vph) (the minimum asymptotic value to consider a left-turn lane) during the AM and PM peak hours, auxiliary turn lanes are not required along Whistle Bare Road at the site access.

Sight Distance

Sight distance measurements were previously taken to the east and west of the proposed site access to 1994 Whistle Bare Road. No speed limit signs were present during the field investigation, and it was therefore assumed that the speed limit is 80 km/h as governed by the Township By-Law.



For a design speed of 100 km/h, the required sight distance under the TAC Geometric Design Guide³ for left-turns from the minor street is 210 metres (in this case to the west) and right-turns from the minor street requires 185 metres (in this case to the east). **Figure 8** and **Figure 9** (attached) demonstrate both sight distance requirements are met.

In terms of stopping sight distance required for a vehicle travelling along Whistle Bare Road, the required sight distance approaching the proposed driveway is 194 metres. **Figure 10** and **Figure 11** (attached) illustrate that the stopping sight distance is achieved approaching the site driveway from either direction.

Generally, Whistle Bare Road is straight and flat in the area of the proposed access to 1994 Whistle Bare Road and the existing site access of the subject development. Given that sight distance and stopping sight distance requirements are met for the driveway to 1994 Whistle Bare Road, these requirements can also be considered met for the existing site access of the subject development.

Conclusions and Recommendations

Based on the investigations conducted, it is concluded that:

- ▶ The existing access to the subject site and the intersection of Whistle Bare Road and Dickie Settlement Road are forecast to operate at acceptable levels of service during the AM and PM peak hours under existing, 2024 background and 2024 total traffic conditions;
- ▶ Auxiliary turn lanes are not warranted along Whistle Bare Road at the existing site access as the 2024 total traffic volumes are too low; and
- ▶ The existing access to the subject site meets the TAC required sight distance criteria for a 100 km/h design speed for traffic travelling along Whistle Bare Road.

Based on the findings and conclusions of this study, it is recommended that the aggregate pit application be approved with no requirements for off-site geometric or traffic operational improvements.

³ Transportation Association of Canada, "Intersections," chap. 9 in *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017), 59.



Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



Jim Mallett

M.A.Sc., P.Eng., PTOE

President and Chief Executive Officer, Principal



Attachments

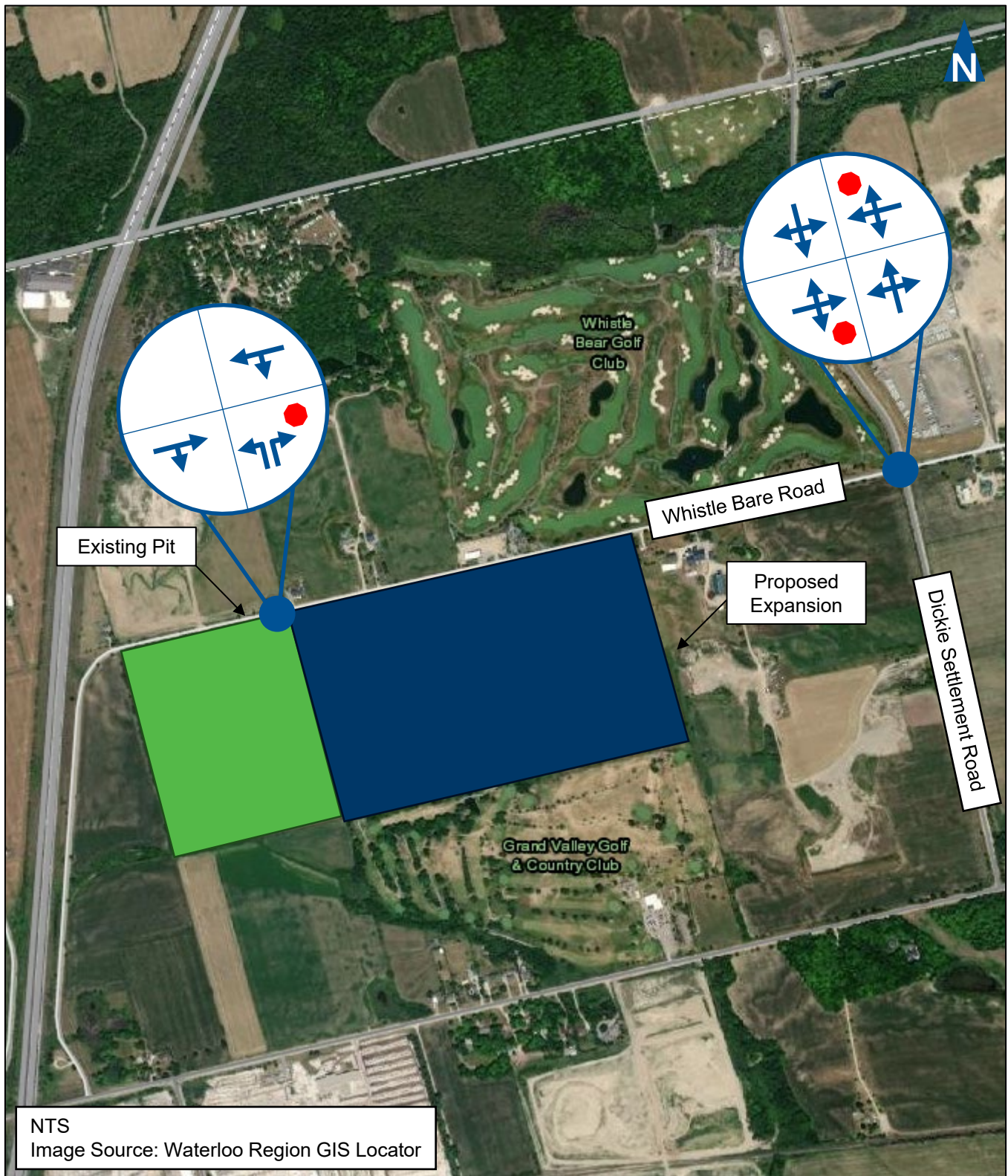




Location of Subject Site

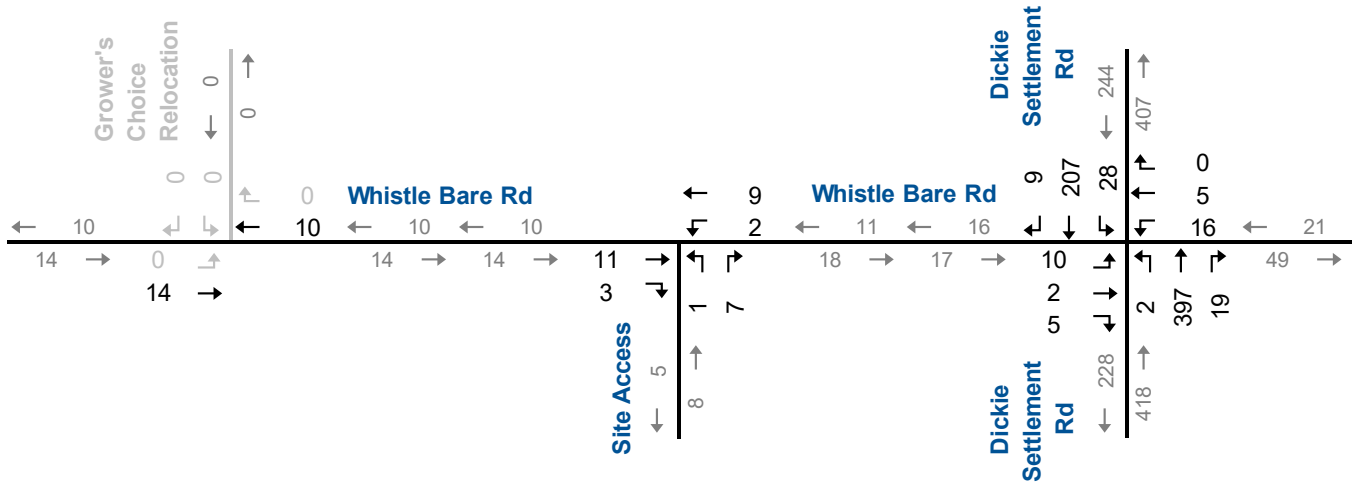
1951 Whistle Bare Road, North Dumfries TIB
230387

Figure 1

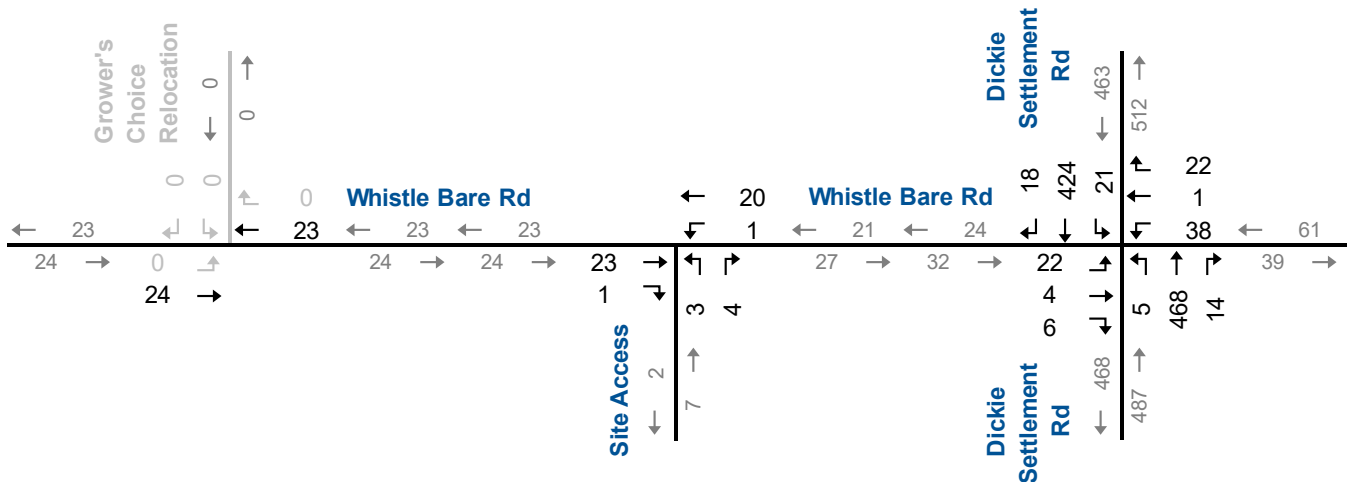


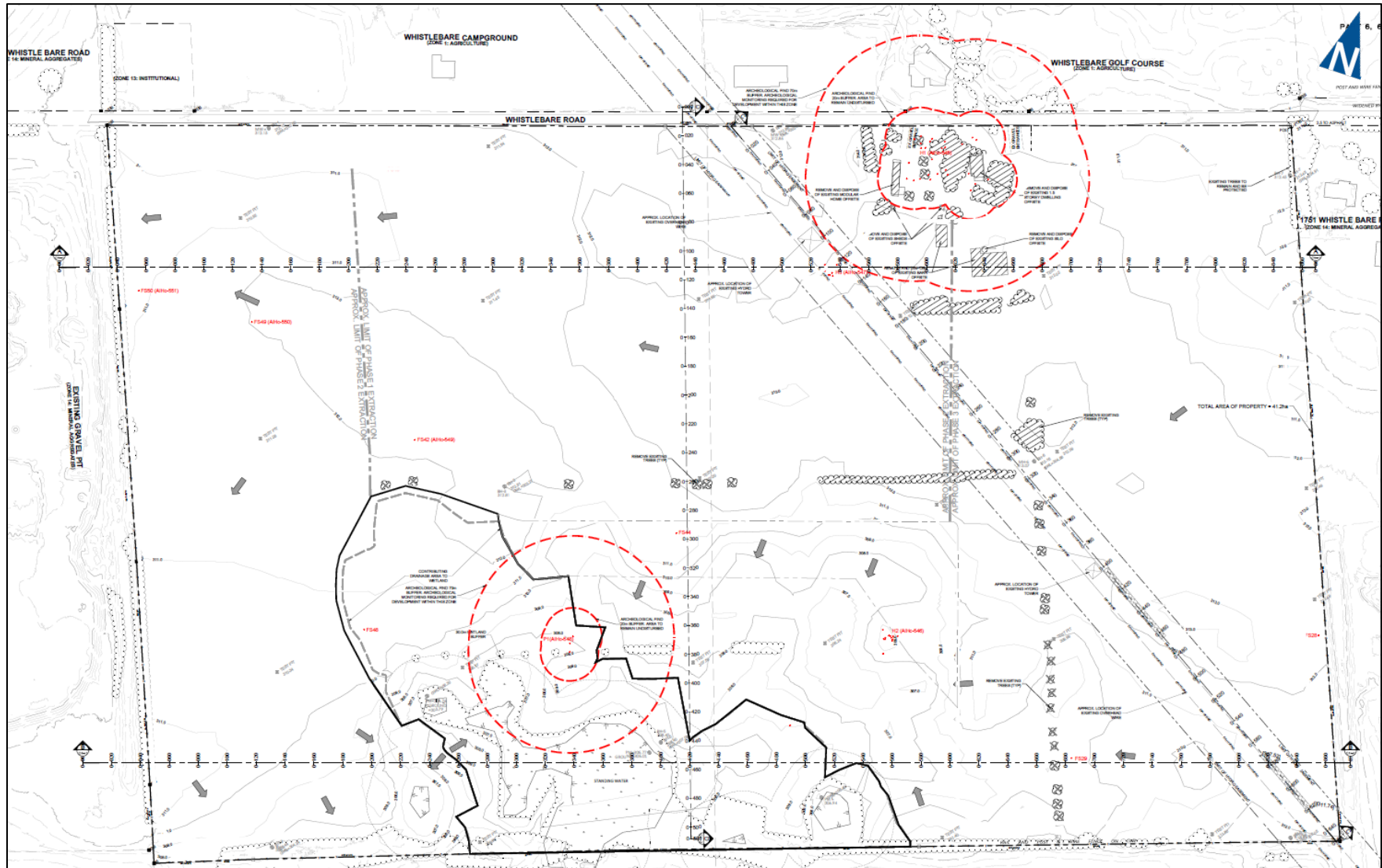


AM Peak



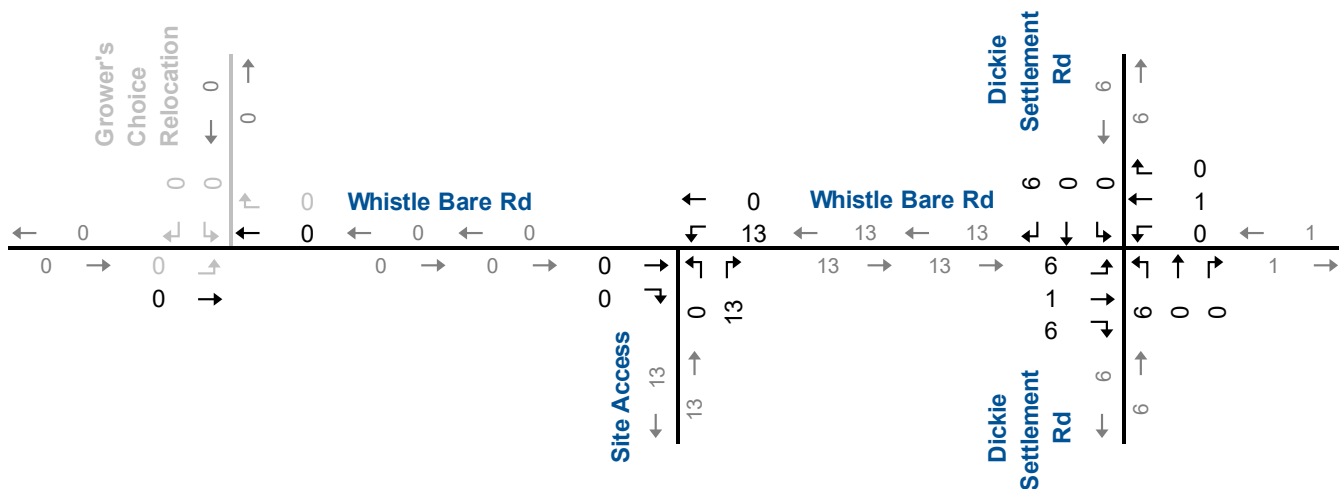
PM Peak







AM Peak

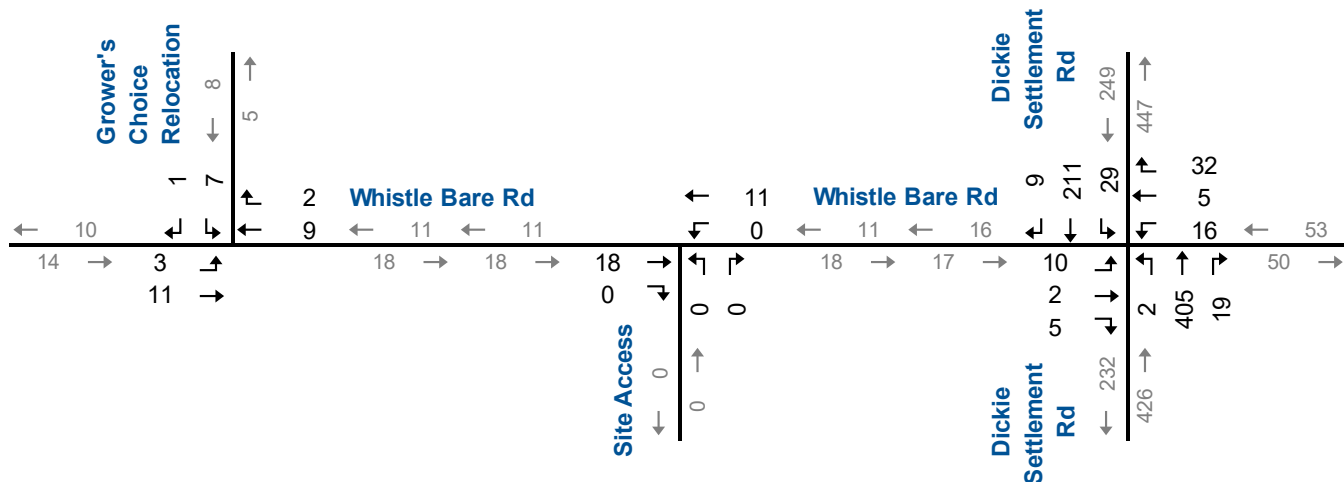


PM Peak

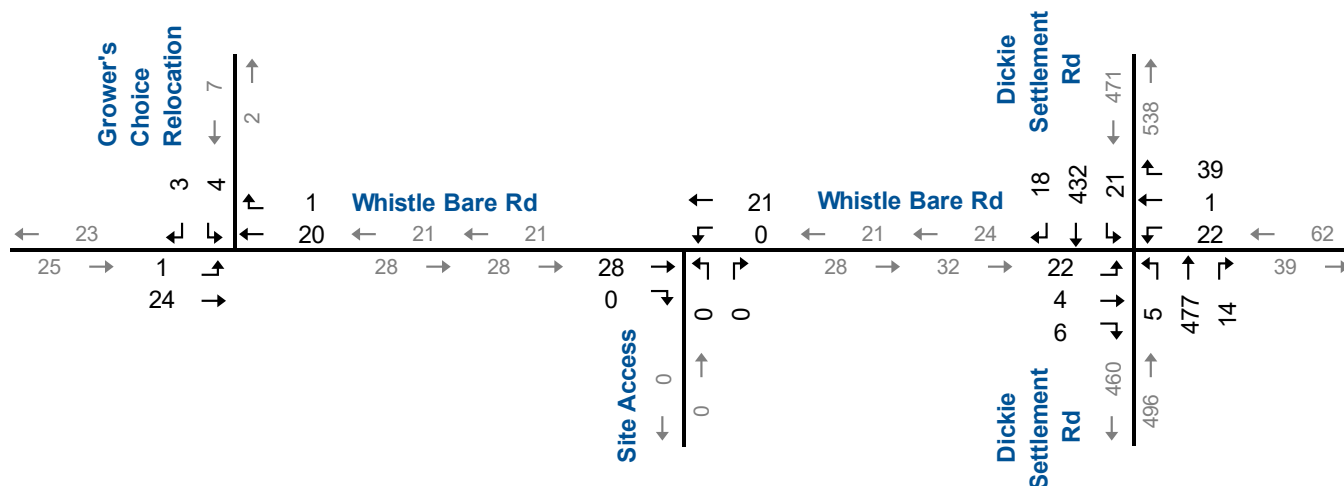




AM Peak

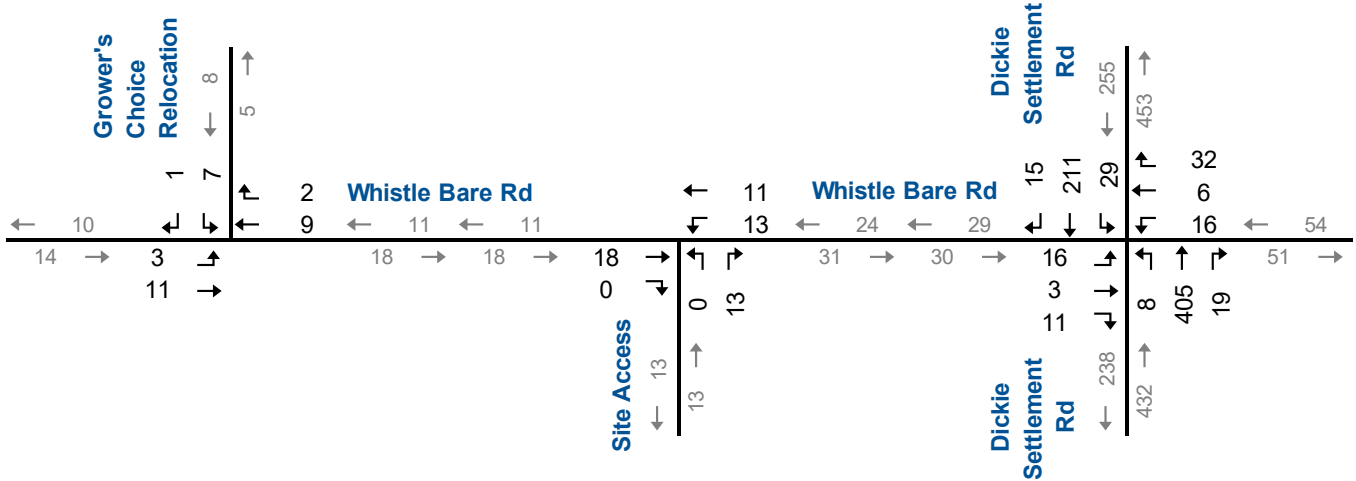


PM Peak

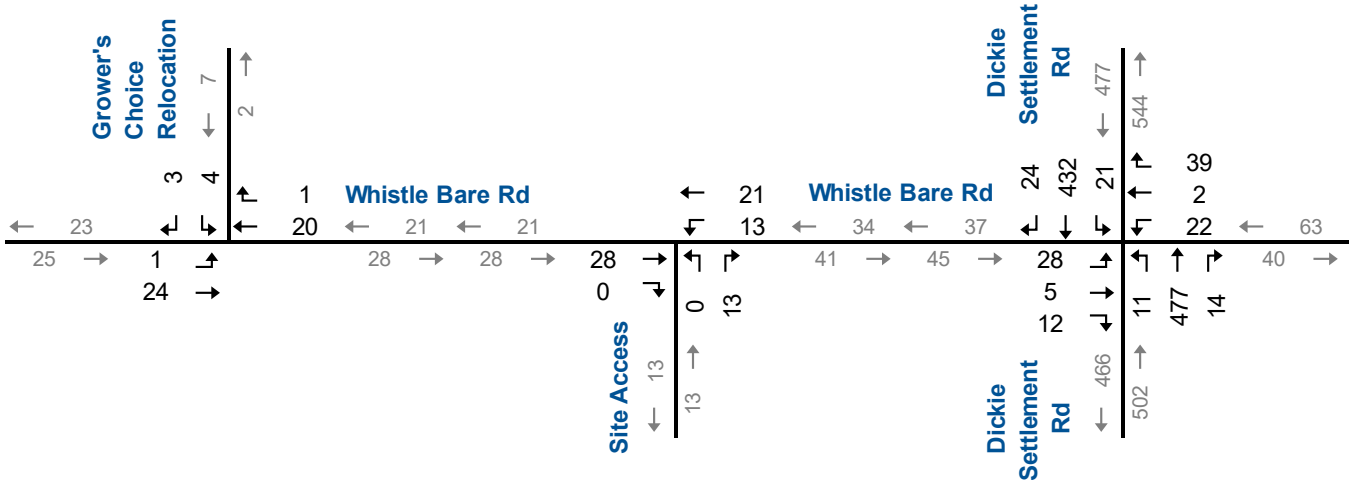




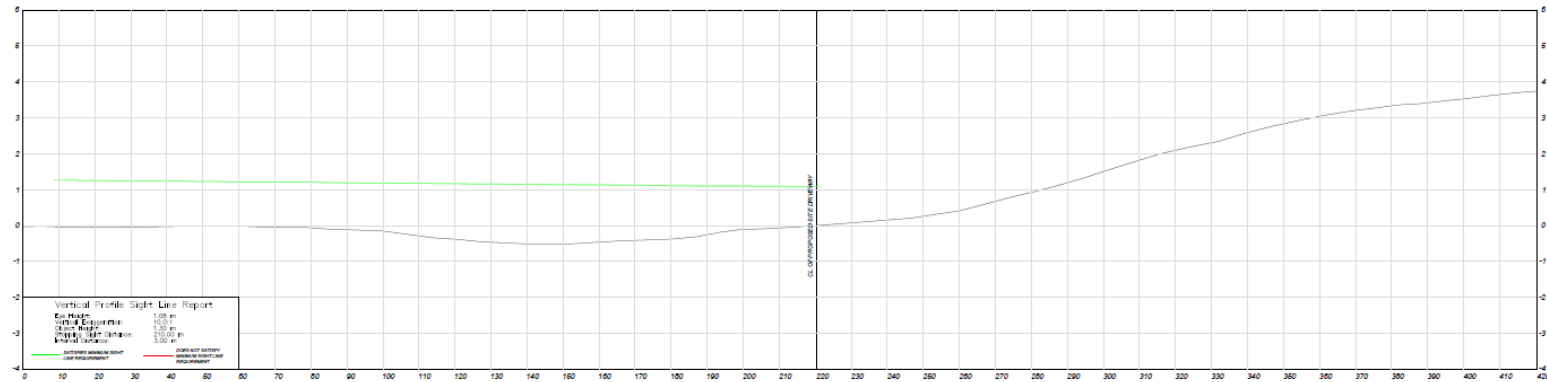
AM Peak



PM Peak



DESIGN SPEED: 100 km/h
INTERSECTION SIGHT DISTANCE - LEFT TURN FROM STOP



TAC SIGHT DISTANCE REVIEW 1951 WHISTLE BARE ROAD CAMBRIDGE, ON		PROJECT NO: 230377 DATE: JUNE 2023 SCALE: 1:500 DRAWING NO: 11	
DRAWING STATUS ISSUED FOR REVIEW APPROVED DATE: _____ SIGNATURE _____		STAMP: _____	



Sight Distance Review (LT from Driveway)

1951 Whistle Bare Road, North Dumfries TIB
 230387

Figure 8

Vertical Profile Sight Line Report

Stationing	100.00 m
Profile Elevation	100.00 m
Profile Slope	0.00%
Profile Sight Distance	100.00 m
Profile Sight Distance	300.00 m

Legend:

- Profile Elevation
- Profile Slope
- Profile Sight Distance
- Profile Sight Distance

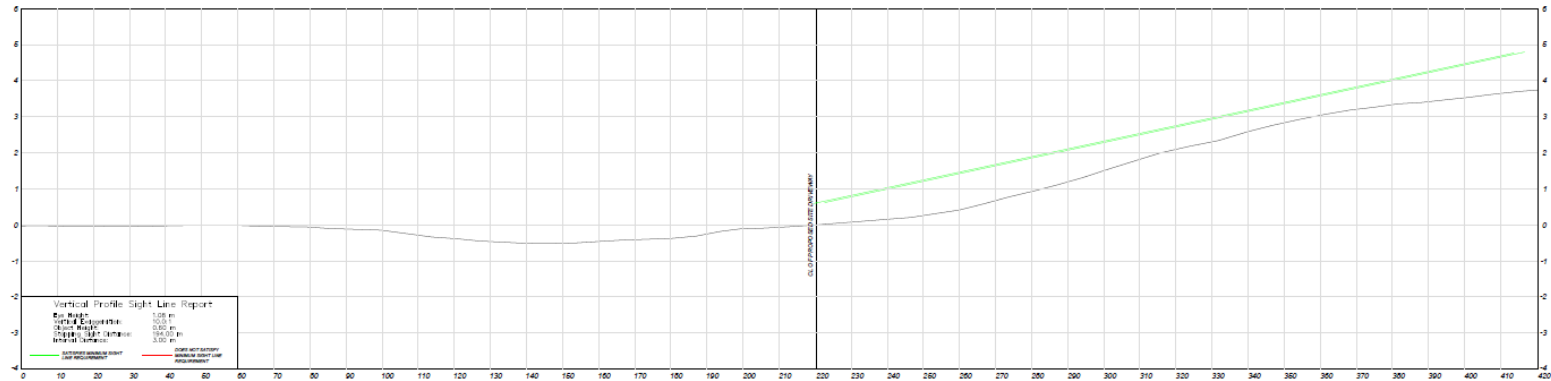
[illegible]

Vertical Profile Sight Line Report

Station	Sight Line Elevation (ft)	Existing Ground (ft)	Proposed Grade (ft)
30	1.00	0.00	0.00
60	1.00	0.00	0.00
90	1.00	0.00	0.00
120	1.00	0.00	0.00
150	1.00	0.00	0.00
180	1.00	0.00	0.00
210	1.00	0.00	0.00
220	0.50	3.50	3.50

[illegible]

DESIGN SPEED: 100 km/h
MINIMUM STOPPING SIGHT DISTANCE - EAST TO WEST



TAC SIGHT DISTANCE REVIEW 1951 WHISTLE BARE ROAD CAMBRIDGE, ON		PROJECT NO: 230387 DATE: JUNE 2023 SCALE: 1:500 DRAWING NO.: 09	
DRAWING STATUS ISSUED FOR REVIEW APPROVED DATE: _____ SIGNATURE: _____		STAMP	



Sight Distance Approaching Driveway from East

1951 Whistle Bare Road, North Dumfries TIB
 230387

Figure 11

Appendix A – Existing Traffic Counts





Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: 1951 Whistle Bare Road
Site Code: 230377
Start Date: 06/07/2023
Page No: 1

Turning Movement Data

Start Time	Whistle Bare Road Eastbound					Whistle Bare Road Westbound					1951 Whistle Bare Road Driveway Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	2	0	0	0	2	0	2	0	0	2	0	0	0	0	0	4
7:15 AM	0	0	0	0	0	1	0	0	0	1	2	2	0	0	4	5
7:30 AM	1	1	0	0	2	1	5	0	0	6	0	1	0	0	1	9
7:45 AM	3	0	0	0	3	0	2	0	0	2	1	0	0	0	1	6
Hourly Total	6	1	0	0	7	2	9	0	0	11	3	3	0	0	6	24
8:00 AM	2	0	0	0	2	0	3	0	0	3	0	1	0	0	1	6
8:15 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
8:45 AM	1	0	0	0	1	1	1	0	0	2	0	0	0	0	0	3
Hourly Total	5	0	0	0	5	1	5	0	0	6	0	1	0	0	1	12
9:00 AM	2	1	0	0	3	1	1	0	0	2	0	0	0	0	0	5
9:15 AM	1	2	0	0	3	1	2	1	0	4	1	1	0	0	2	9
9:30 AM	4	1	0	0	5	0	3	0	0	3	0	2	0	0	2	10
9:45 AM	5	0	0	0	5	0	3	0	0	3	0	0	0	0	0	8
Hourly Total	12	4	0	0	16	2	9	1	0	12	1	3	0	0	4	32
10:00 AM	1	0	0	0	1	1	1	0	0	2	0	4	0	0	4	7
10:15 AM	2	0	0	0	2	0	1	0	0	1	0	1	0	0	1	4
10:30 AM	1	0	0	0	1	2	2	0	0	4	0	1	0	0	1	6
10:45 AM	2	2	0	0	4	1	7	0	0	8	0	2	0	0	2	14
Hourly Total	6	2	0	0	8	4	11	0	0	15	0	8	0	0	8	31
11:00 AM	0	0	0	0	0	1	4	0	0	5	0	1	1	0	2	7
11:15 AM	5	0	0	0	5	0	2	0	0	2	0	0	0	0	0	7
11:30 AM	0	0	0	0	0	3	2	0	0	5	0	1	0	0	1	6
11:45 AM	3	0	0	0	3	1	4	0	0	5	1	1	0	0	2	10
Hourly Total	8	0	0	0	8	5	12	0	0	17	1	3	1	0	5	30
12:00 PM	2	0	0	0	2	1	6	0	0	7	0	1	0	0	1	10
12:15 PM	1	0	0	0	1	1	7	0	0	8	0	1	0	0	1	10
12:30 PM	3	0	0	0	3	3	5	0	0	8	1	0	0	0	1	12
12:45 PM	1	0	0	0	1	1	1	0	0	2	1	3	0	0	4	7
Hourly Total	7	0	0	0	7	6	19	0	0	25	2	5	0	0	7	39
1:00 PM	3	0	0	0	3	0	1	0	0	1	0	2	0	0	2	6
1:15 PM	4	1	0	0	5	0	2	0	0	2	0	1	0	0	1	8
1:30 PM	3	0	0	0	3	2	5	0	0	7	1	1	0	0	2	12
1:45 PM	4	1	0	0	5	1	2	0	0	3	0	0	0	0	0	8
Hourly Total	14	2	0	0	16	3	10	0	0	13	1	4	0	0	5	34
2:00 PM	3	1	0	0	4	2	3	0	0	5	0	0	0	0	0	9

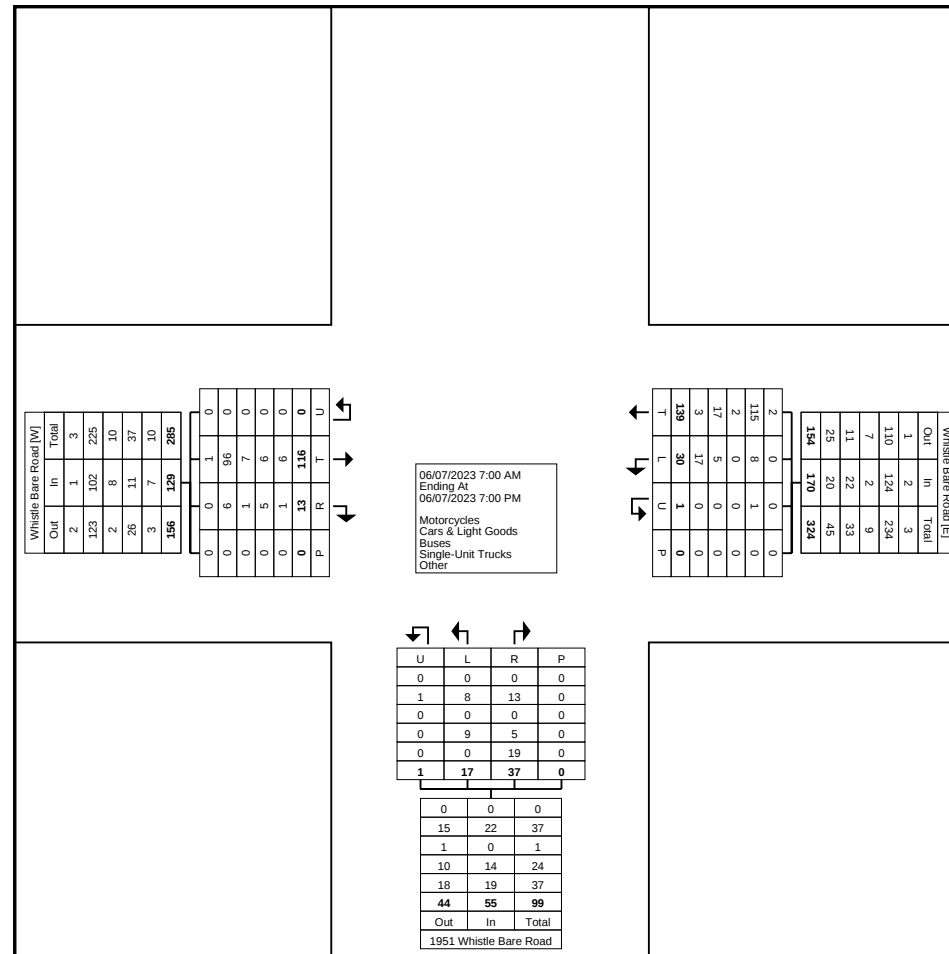
2:15 PM	0	0	0	0	0	1	3	0	0	4	2	0	0	0	2	6
2:30 PM	0	1	0	0	1	1	1	0	0	2	2	0	0	0	2	5
2:45 PM	4	1	0	0	5	1	2	0	0	3	0	1	0	0	1	9
Hourly Total	7	3	0	0	10	5	9	0	0	14	4	1	0	0	5	29
3:00 PM	4	0	0	0	4	0	5	0	0	5	1	3	0	0	4	13
3:15 PM	6	0	0	0	6	1	5	0	0	6	0	0	0	0	0	12
3:30 PM	4	1	0	0	5	0	5	0	0	5	1	1	0	0	2	12
3:45 PM	9	0	0	0	9	0	5	0	0	5	1	0	0	0	1	15
Hourly Total	23	1	0	0	24	1	20	0	0	21	3	4	0	0	7	52
4:00 PM	3	0	0	0	3	0	4	0	0	4	0	1	0	0	1	8
4:15 PM	3	0	0	0	3	0	3	0	0	3	1	0	0	0	1	7
4:30 PM	3	0	0	0	3	1	2	0	0	3	0	0	0	0	0	6
4:45 PM	1	0	0	0	1	0	3	0	0	3	0	3	0	0	3	7
Hourly Total	10	0	0	0	10	1	12	0	0	13	1	4	0	0	5	28
5:00 PM	3	0	0	0	3	0	5	0	0	5	0	0	0	0	0	8
5:15 PM	4	0	0	0	4	0	4	0	0	4	0	0	0	0	0	8
5:30 PM	3	0	0	0	3	0	4	0	0	4	1	1	0	0	2	9
5:45 PM	2	0	0	0	2	0	4	0	0	4	0	0	0	0	0	6
Hourly Total	12	0	0	0	12	0	17	0	0	17	1	1	0	0	2	31
6:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:15 PM	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	4
6:30 PM	3	0	0	0	3	0	1	0	0	1	0	0	0	0	0	4
6:45 PM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	3
Hourly Total	6	0	0	0	6	0	6	0	0	6	0	0	0	0	0	12
Grand Total	116	13	0	0	129	30	139	1	0	170	17	37	1	0	55	354
Approach %	89.9	10.1	0.0	-	-	17.6	81.8	0.6	-	-	30.9	67.3	1.8	-	-	-
Total %	32.8	3.7	0.0	-	36.4	8.5	39.3	0.3	-	48.0	4.8	10.5	0.3	-	15.5	-
Motorcycles	1	0	0	-	1	0	2	0	-	2	0	0	0	-	0	3
% Motorcycles	0.9	0.0	-	-	0.8	0.0	1.4	0.0	-	1.2	0.0	0.0	0.0	-	0.0	0.8
Cars & Light Goods	96	6	0	-	102	8	115	1	-	124	8	13	1	-	22	248
% Cars & Light Goods	82.8	46.2	-	-	79.1	26.7	82.7	100.0	-	72.9	47.1	35.1	100.0	-	40.0	70.1
Buses	7	1	0	-	8	0	2	0	-	2	0	0	0	-	0	10
% Buses	6.0	7.7	-	-	6.2	0.0	1.4	0.0	-	1.2	0.0	0.0	0.0	-	0.0	2.8
Single-Unit Trucks	6	5	0	-	11	5	17	0	-	22	9	5	0	-	14	47
% Single-Unit Trucks	5.2	38.5	-	-	8.5	16.7	12.2	0.0	-	12.9	52.9	13.5	0.0	-	25.5	13.3
Articulated Trucks	2	1	0	-	3	17	1	0	-	18	0	19	0	-	19	40
% Articulated Trucks	1.7	7.7	-	-	2.3	56.7	0.7	0.0	-	10.6	0.0	51.4	0.0	-	34.5	11.3
Bicycles on Road	4	0	0	-	4	0	2	0	-	2	0	0	0	-	0	6
% Bicycles on Road	3.4	0.0	-	-	3.1	0.0	1.4	0.0	-	1.2	0.0	0.0	0.0	-	0.0	1.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: 1951 Whistle Bare Road
Site Code: 230377
Start Date: 06/07/2023
Page No: 3



Turning Movement Data Plot

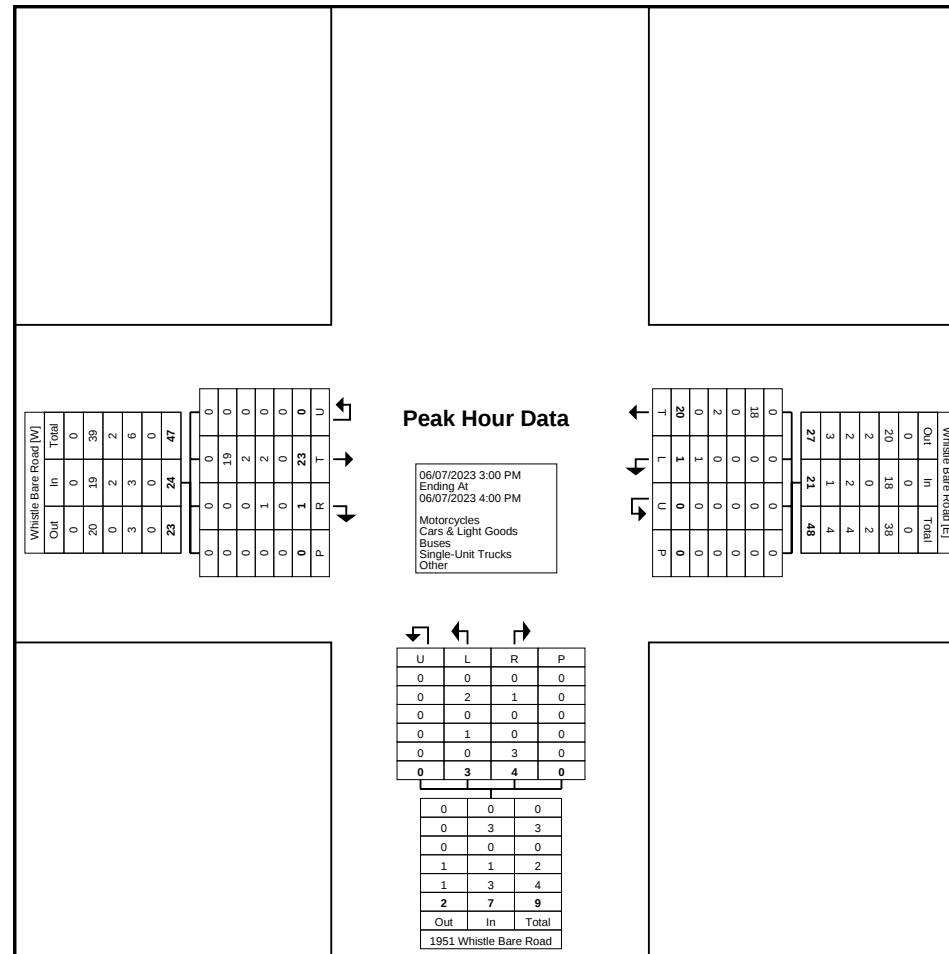
Start Time	Whistle Bare Road Eastbound					Whistle Bare Road Westbound					1951 Whistle Bare Road Driveway Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
3:00 PM	4	0	0	0	4	0	5	0	0	5	1	3	0	0	4	13
3:15 PM	6	0	0	0	6	1	5	0	0	6	0	0	0	0	0	12
3:30 PM	4	1	0	0	5	0	5	0	0	5	1	1	0	0	2	12
3:45 PM	9	0	0	0	9	0	5	0	0	5	1	0	0	0	1	15
Total	23	1	0	0	24	1	20	0	0	21	3	4	0	0	7	52
Approach %	95.8	4.2	0.0	-	-	4.8	95.2	0.0	-	-	42.9	57.1	0.0	-	-	-
Total %	44.2	1.9	0.0	-	46.2	1.9	38.5	0.0	-	40.4	5.8	7.7	0.0	-	13.5	-
PHF	0.639	0.250	0.000	-	0.667	0.250	1.000	0.000	-	0.875	0.750	0.333	0.000	-	0.438	0.867
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	19	0	0	-	19	0	18	0	-	18	2	1	0	-	3	40
% Cars & Light Goods	82.6	0.0	-	-	79.2	0.0	90.0	-	-	85.7	66.7	25.0	-	-	42.9	76.9
Buses	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Buses	8.7	0.0	-	-	8.3	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	3.8
Single-Unit Trucks	2	1	0	-	3	0	2	0	-	2	1	0	0	-	1	6
% Single-Unit Trucks	8.7	100.0	-	-	12.5	0.0	10.0	-	-	9.5	33.3	0.0	-	-	14.3	11.5
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	3	0	-	3	4
% Articulated Trucks	0.0	0.0	-	-	0.0	100.0	0.0	-	-	4.8	0.0	75.0	-	-	42.9	7.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: 1951 Whistle Bare Road
Site Code: 230377
Start Date: 06/07/2023
Page No: 5



Turning Movement Peak Hour Data Plot (3:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cdowness@ptsl.com

Count Name: Whistle Bare Road & Dickie
Settlement Road
Site Code: 230377
Start Date: 06/07/2023
Page No: 1

Turning Movement Data

Start Time	Whistle Bare Road Eastbound						Whistle Bare Road Westbound						Dickie Settlement Road Northbound						Dickie Settlement Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	1	0	0	0	3	0	0	5	0	0	5	1	82	10	0	0	93	12	41	1	0	0	54	155
7:15 AM	9	1	0	0	0	10	7	0	15	0	0	22	1	78	5	0	0	84	11	47	2	0	0	60	176
7:30 AM	4	1	2	0	0	7	4	2	8	0	0	14	1	124	3	0	0	128	5	46	3	0	0	54	203
7:45 AM	2	1	1	0	0	4	5	0	11	0	0	16	0	88	6	0	0	94	5	67	4	0	0	76	190
Hourly Total	17	4	3	0	0	24	16	2	39	0	0	57	3	372	24	0	0	399	33	201	10	0	0	244	724
8:00 AM	1	0	2	0	0	3	3	2	6	0	0	11	1	84	7	0	0	92	7	47	0	0	0	54	160
8:15 AM	3	0	0	0	0	3	4	1	6	0	0	11	0	101	3	1	0	105	11	47	2	0	0	60	179
8:30 AM	1	0	2	0	0	3	2	0	7	0	0	9	1	92	2	0	0	95	8	42	2	0	0	52	159
8:45 AM	1	0	1	0	0	2	1	0	10	0	0	11	0	74	3	0	0	77	13	42	1	0	0	56	146
Hourly Total	6	0	5	0	0	11	10	3	29	0	0	42	2	351	15	1	0	369	39	178	5	0	0	222	644
9:00 AM	2	0	1	0	0	3	1	0	6	0	0	7	1	68	2	0	0	71	7	37	3	0	0	47	128
9:15 AM	4	0	0	0	0	4	4	2	13	0	0	19	0	84	6	0	0	90	5	43	2	0	0	50	163
9:30 AM	6	0	2	0	0	8	4	2	6	0	0	12	0	68	2	0	0	70	7	43	3	0	0	53	143
9:45 AM	5	0	1	0	0	6	2	0	9	0	0	11	2	56	3	0	0	61	5	41	1	0	0	47	125
Hourly Total	17	0	4	0	0	21	11	4	34	0	0	49	3	276	13	0	0	292	24	164	9	0	0	197	559
10:00 AM	4	1	4	0	0	9	2	1	8	0	0	11	1	57	5	0	0	63	13	37	2	0	0	52	135
10:15 AM	4	1	0	0	0	5	0	1	9	0	0	10	0	49	3	0	0	52	14	27	2	0	0	43	110
10:30 AM	2	1	1	0	0	4	3	0	12	0	0	15	1	51	4	0	0	56	6	43	3	0	0	52	127
10:45 AM	3	0	1	0	0	4	3	1	8	0	0	12	0	42	3	0	0	45	7	42	4	0	0	53	114
Hourly Total	13	3	6	0	0	22	8	3	37	0	0	48	2	199	15	0	0	216	40	149	11	0	0	200	486
11:00 AM	0	0	0	0	0	0	1	2	9	0	0	12	1	48	7	0	0	56	8	37	3	0	0	48	116
11:15 AM	9	0	1	0	0	10	2	2	13	0	0	17	1	47	6	0	0	54	7	41	1	0	0	49	130
11:30 AM	1	0	0	0	0	1	3	1	6	0	0	10	1	49	7	0	0	57	16	41	3	0	0	60	128
11:45 AM	3	1	0	0	0	4	2	1	10	0	0	13	1	57	4	0	0	62	8	45	3	0	0	56	135
Hourly Total	13	1	1	0	0	15	8	6	38	0	0	52	4	201	24	0	0	229	39	164	10	0	0	213	509
12:00 PM	2	0	1	0	0	3	5	3	9	0	0	17	0	39	6	0	0	45	11	36	6	0	0	53	118
12:15 PM	4	0	1	0	0	5	2	2	14	0	1	18	1	49	5	0	0	55	16	57	4	0	0	77	155
12:30 PM	2	0	0	0	0	2	3	2	14	0	0	19	2	38	4	0	0	44	11	42	3	0	0	56	121
12:45 PM	6	1	2	0	0	9	4	2	13	0	0	19	1	50	2	0	0	53	7	53	2	0	0	62	143
Hourly Total	14	1	4	0	0	19	14	9	50	0	1	73	4	176	17	0	0	197	45	188	15	0	0	248	537
1:00 PM	3	0	1	0	0	4	1	0	9	0	0	10	1	62	3	0	0	66	6	51	4	0	0	61	141
1:15 PM	5	0	1	0	0	6	1	1	7	0	0	9	0	51	6	0	0	57	7	40	2	0	0	49	121
1:30 PM	3	1	1	0	0	5	3	1	10	0	0	14	2	58	2	0	0	62	9	71	7	0	0	87	168
1:45 PM	5	0	1	0	0	6	4	1	12	0	0	17	0	47	6	0	0	53	12	48	4	0	0	64	140
Hourly Total	16	1	4	0	0	21	9	3	38	0	0	50	3	218	17	0	0	238	34	210	17	0	0	261	570

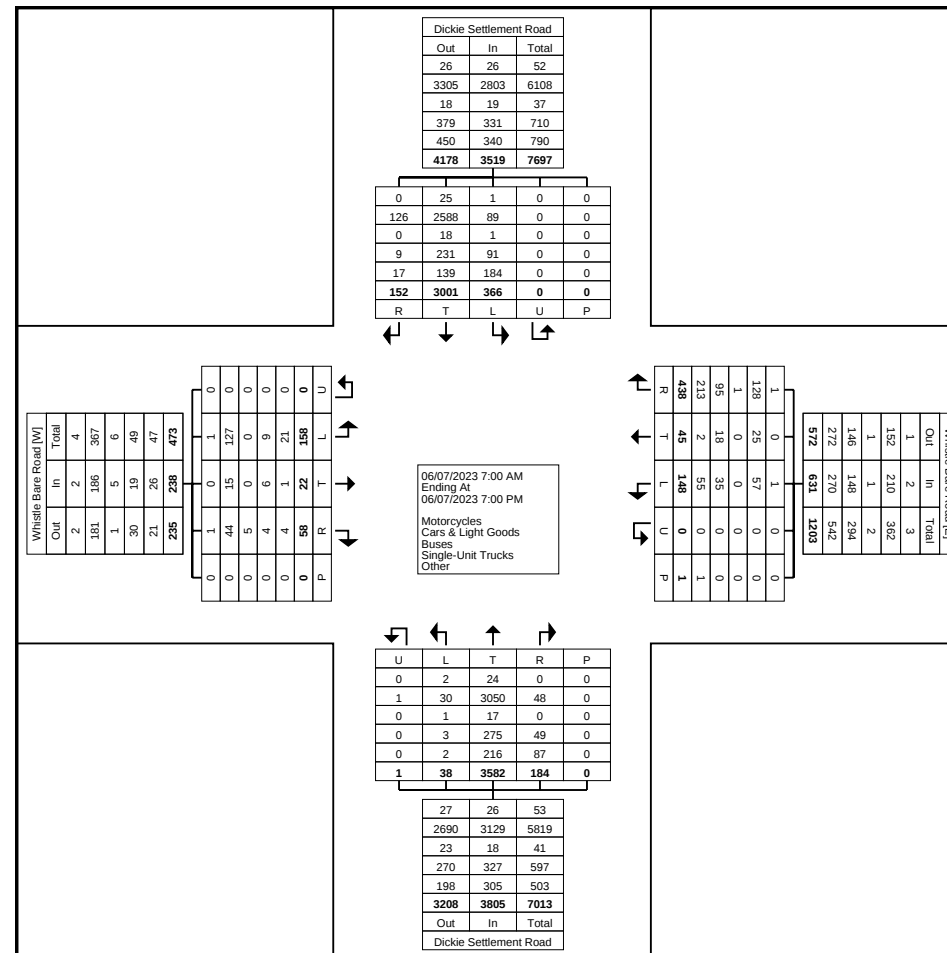
2:00 PM	2	2	1	0	0	5	3	2	11	0	0	16	0	55	5	0	0	60	6	64	3	0	0	73	154
2:15 PM	1	0	1	0	0	2	4	0	10	0	0	14	1	63	4	0	0	68	14	63	4	0	0	81	165
2:30 PM	2	1	0	0	0	3	2	0	10	0	0	12	2	100	4	0	0	106	13	65	4	0	0	82	203
2:45 PM	4	0	1	0	0	5	5	0	13	0	0	18	0	122	0	0	0	122	8	70	3	0	0	81	226
Hourly Total	9	3	3	0	0	15	14	2	44	0	0	60	3	340	13	0	0	356	41	262	14	0	0	317	748
3:00 PM	6	1	2	0	0	9	3	3	8	0	0	14	0	104	4	0	0	108	7	73	2	0	0	82	213
3:15 PM	5	0	2	0	0	7	2	2	10	0	0	14	0	106	5	0	0	111	7	102	5	0	0	114	246
3:30 PM	3	0	1	0	0	4	7	1	12	0	0	20	1	105	4	0	0	110	7	88	6	0	0	101	235
3:45 PM	6	3	3	0	0	12	5	1	8	0	0	14	2	114	3	0	0	119	6	86	5	0	0	97	242
Hourly Total	20	4	8	0	0	32	17	7	38	0	0	62	3	429	16	0	0	448	27	349	18	0	0	394	936
4:00 PM	10	0	1	0	0	11	8	0	12	0	0	20	1	129	5	0	0	135	7	116	4	0	0	127	293
4:15 PM	3	1	0	0	0	4	4	0	14	0	0	18	0	103	3	0	0	106	2	108	5	0	0	115	243
4:30 PM	3	0	2	0	0	5	5	0	4	0	0	9	2	122	3	0	0	127	6	114	4	0	0	124	265
4:45 PM	4	0	1	0	0	5	1	0	6	0	0	7	1	91	6	0	0	98	4	124	4	0	0	132	242
Hourly Total	20	1	4	0	0	25	18	0	36	0	0	54	4	445	17	0	0	466	19	462	17	0	0	498	1043
5:00 PM	1	1	6	0	0	8	4	3	9	0	0	16	0	113	2	0	0	115	7	101	3	0	0	111	250
5:15 PM	2	2	0	0	0	4	6	0	7	0	0	13	1	93	4	0	0	98	6	116	5	0	0	127	242
5:30 PM	3	1	2	0	0	6	6	0	13	0	0	19	0	67	0	0	0	67	2	118	4	0	0	124	216
5:45 PM	2	0	2	0	0	4	0	2	6	0	0	8	0	55	2	0	0	57	4	96	5	0	0	105	174
Hourly Total	8	4	10	0	0	22	16	5	35	0	0	56	1	328	8	0	0	337	19	431	17	0	0	467	882
6:00 PM	2	0	1	0	0	3	3	0	8	0	0	11	1	68	1	0	0	70	6	99	4	0	0	109	193
6:15 PM	1	0	4	0	0	5	2	0	4	0	0	6	5	56	3	0	0	64	0	51	3	0	0	54	129
6:30 PM	1	0	1	0	0	2	1	0	4	0	0	5	0	61	1	0	0	62	0	56	0	0	0	56	125
6:45 PM	1	0	0	0	0	1	1	1	4	0	0	6	0	62	0	0	0	62	0	37	2	0	0	39	108
Hourly Total	5	0	6	0	0	11	7	1	20	0	0	28	6	247	5	0	0	258	6	243	9	0	0	258	555
Grand Total	158	22	58	0	0	238	148	45	438	0	1	631	38	3582	184	1	0	3805	366	3001	152	0	0	3519	8193
Approach %	66.4	9.2	24.4	0.0	-	-	23.5	7.1	69.4	0.0	-	-	1.0	94.1	4.8	0.0	-	-	10.4	85.3	4.3	0.0	-	-	-
Total %	1.9	0.3	0.7	0.0	-	2.9	1.8	0.5	5.3	0.0	-	7.7	0.5	43.7	2.2	0.0	-	46.4	4.5	36.6	1.9	0.0	-	43.0	-
Motorcycles	1	0	1	0	-	2	1	0	1	0	-	2	2	24	0	0	-	26	1	25	0	0	-	26	56
% Motorcycles	0.6	0.0	1.7	-	-	0.8	0.7	0.0	0.2	-	-	0.3	5.3	0.7	0.0	0.0	-	0.7	0.3	0.8	0.0	-	-	0.7	0.7
Cars & Light Goods	127	15	44	0	-	186	57	25	128	0	-	210	30	3050	48	1	-	3129	89	2588	126	0	-	2803	6328
% Cars & Light Goods	80.4	68.2	75.9	-	-	78.2	38.5	55.6	29.2	-	-	33.3	78.9	85.1	26.1	100.0	-	82.2	24.3	86.2	82.9	-	-	79.7	77.2
Buses	0	0	5	0	-	5	0	0	1	0	-	1	1	17	0	0	-	18	1	18	0	0	-	19	43
% Buses	0.0	0.0	8.6	-	-	2.1	0.0	0.0	0.2	-	-	0.2	2.6	0.5	0.0	0.0	-	0.5	0.3	0.6	0.0	-	-	0.5	0.5
Single-Unit Trucks	9	6	4	0	-	19	35	18	95	0	-	148	3	275	49	0	-	327	91	231	9	0	-	331	825
% Single-Unit Trucks	5.7	27.3	6.9	-	-	8.0	23.6	40.0	21.7	-	-	23.5	7.9	7.7	26.6	0.0	-	8.6	24.9	7.7	5.9	-	-	9.4	10.1
Articulated Trucks	18	1	4	0	-	23	55	1	213	0	-	269	2	216	87	0	-	305	184	139	17	0	-	340	937
% Articulated Trucks	11.4	4.5	6.9	-	-	9.7	37.2	2.2	48.6	-	-	42.6	5.3	6.0	47.3	0.0	-	8.0	50.3	4.6	11.2	-	-	9.7	11.4
Bicycles on Road	3	0	0	0	-	3	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	4
% Bicycles on Road	1.9	0.0	0.0	-	-	1.3	0.0	2.2	0.0	-	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cdowness@ptsil.com

Count Name: Whistle Bare Road & Dickie
Settlement Road
Site Code: 230377
Start Date: 06/07/2023
Page No: 3



Turning Movement Data Plot



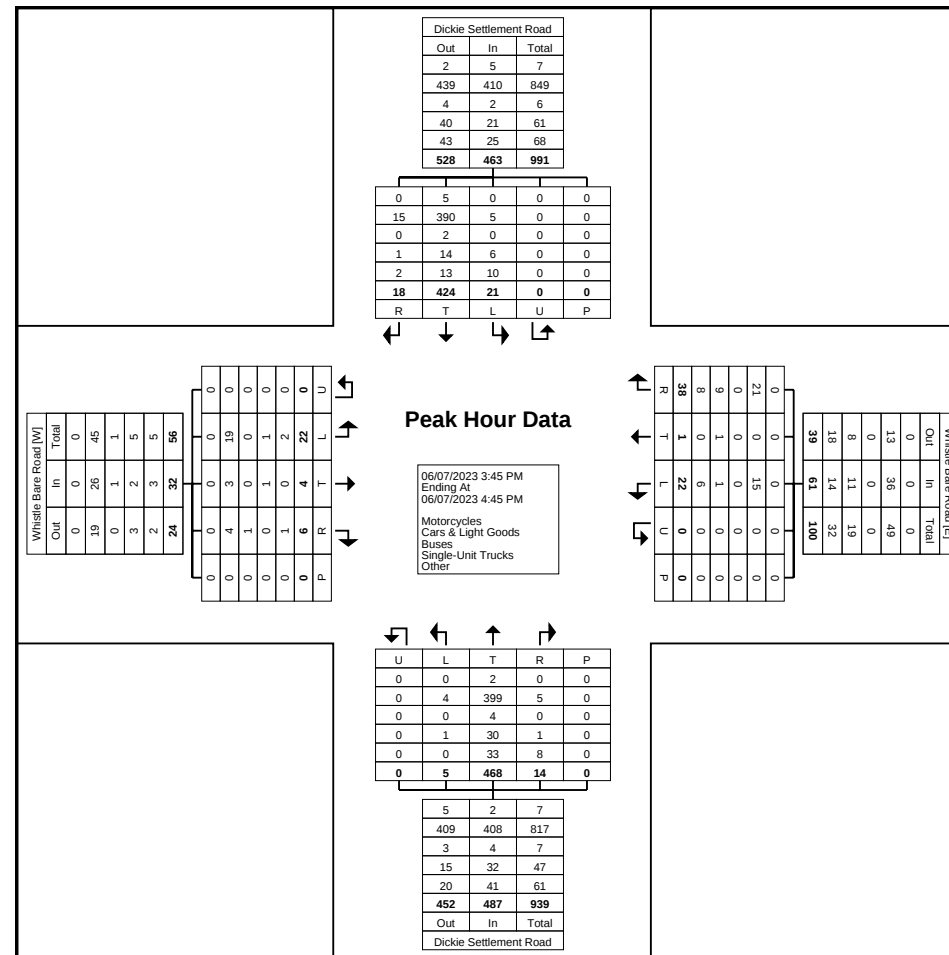
Start Time	Whistle Bare Road Eastbound						Whistle Bare Road Westbound						Dickie Settlement Road Northbound						Dickie Settlement Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:45 PM	6	3	3	0	0	12	5	1	8	0	0	14	2	114	3	0	0	119	6	86	5	0	0	97	242
4:00 PM	10	0	1	0	0	11	8	0	12	0	0	20	1	129	5	0	0	135	7	116	4	0	0	127	293
4:15 PM	3	1	0	0	0	4	4	0	14	0	0	18	0	103	3	0	0	106	2	108	5	0	0	115	243
4:30 PM	3	0	2	0	0	5	5	0	4	0	0	9	2	122	3	0	0	127	6	114	4	0	0	124	265
Total	22	4	6	0	0	32	22	1	38	0	0	61	5	468	14	0	0	487	21	424	18	0	0	463	1043
Approach %	68.8	12.5	18.8	0.0	-	-	36.1	1.6	62.3	0.0	-	-	1.0	96.1	2.9	0.0	-	-	4.5	91.6	3.9	0.0	-	-	-
Total %	2.1	0.4	0.6	0.0	-	3.1	2.1	0.1	3.6	0.0	-	5.8	0.5	44.9	1.3	0.0	-	46.7	2.0	40.7	1.7	0.0	-	44.4	-
PHF	0.550	0.333	0.500	0.000	-	0.667	0.688	0.250	0.679	0.000	-	0.763	0.625	0.907	0.700	0.000	-	0.902	0.750	0.914	0.900	0.000	-	0.911	0.890
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	5	0	0	-	5	7
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.4	0.0	1.2	0.0	-	-	1.1	0.7
Cars & Light Goods	19	3	4	0	-	26	15	0	21	0	-	36	4	399	5	0	-	408	5	390	15	0	-	410	880
% Cars & Light Goods	86.4	75.0	66.7	-	-	81.3	68.2	0.0	55.3	-	-	59.0	80.0	85.3	35.7	-	-	83.8	23.8	92.0	83.3	-	-	88.6	84.4
Buses	0	0	1	0	-	1	0	0	0	0	-	0	0	4	0	0	-	4	0	2	0	0	-	2	7
% Buses	0.0	0.0	16.7	-	-	3.1	0.0	0.0	0.0	-	-	0.0	0.0	0.9	0.0	-	-	0.8	0.0	0.5	0.0	-	-	0.4	0.7
Single-Unit Trucks	1	1	0	0	-	2	1	1	9	0	-	11	1	30	1	0	-	32	6	14	1	0	-	21	66
% Single-Unit Trucks	4.5	25.0	0.0	-	-	6.3	4.5	100.0	23.7	-	-	18.0	20.0	6.4	7.1	-	-	6.6	28.6	3.3	5.6	-	-	4.5	6.3
Articulated Trucks	2	0	1	0	-	3	6	0	8	0	-	14	0	33	8	0	-	41	10	13	2	0	-	25	83
% Articulated Trucks	9.1	0.0	16.7	-	-	9.4	27.3	0.0	21.1	-	-	23.0	0.0	7.1	57.1	-	-	8.4	47.6	3.1	11.1	-	-	5.4	8.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Whistle Bare Road & Dickie
Settlement Road
Site Code: 230377
Start Date: 06/07/2023
Page No: 5



Turning Movement Peak Hour Data Plot (3:45 PM)

Appendix B – Existing Traffic Operations Report



Lanes, Volumes, Timings

Existing AM

1: Dickie Settlement Road & Whistle Bare Road

(230387) 1951 Whistle Bare Road, North Dumfries

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	5	16	5	0	2	397	19	28	207	9
Future Volume (vph)	10	2	5	16	5	0	2	397	19	28	207	9
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960						0.994			0.995	
Flt Protected		0.971			0.963						0.994	
Satd. Flow (prot)	0	1157	0	0	775	0	0	1350	0	0	1207	0
Flt Permitted		0.971			0.963						0.994	
Satd. Flow (perm)	0	1157	0	0	775	0	0	1350	0	0	1207	0
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		1506.5			335.8			382.3			397.4	
Travel Time (s)		67.8			15.1			17.2			17.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	50%	60%	100%	60%	71%	100%	9%	84%	75%	20%	0%
Adj. Flow (vph)	10	2	5	16	5	0	2	397	19	28	207	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	21	0	0	418	0	0	244	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	49.7%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM 6th TWSC
1: Dickie Settlement Road & Whistle Bare Road

Existing AM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	2	5	16	5	0	2	397	19	28	207	9
Future Vol, veh/h	10	2	5	16	5	0	2	397	19	28	207	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	50	60	100	60	71	100	9	84	75	20	0
Mvmt Flow	10	2	5	16	5	0	2	397	19	28	207	9
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	681	688	212	682	683	407	216	0	0	416	0	0
Stage 1	268	268	-	411	411	-	-	-	-	-	-	-
Stage 2	413	420	-	271	272	-	-	-	-	-	-	-
Critical Hdwy	7.1	7	6.8	8.1	7.1	6.91	5.1	-	-	4.85	-	-
Critical Hdwy Stg 1	6.1	6	-	7.1	6.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6	-	7.1	6.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.45	3.84	4.4	4.54	3.939	3.1	-	-	2.875	-	-
Pot Cap-1 Maneuver	367	315	702	260	308	519	937	-	-	840	-	-
Stage 1	742	608	-	463	506	-	-	-	-	-	-	-
Stage 2	620	515	-	563	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	351	302	702	249	295	519	937	-	-	840	-	-
Mov Cap-2 Maneuver	351	302	-	249	295	-	-	-	-	-	-	-
Stage 1	740	585	-	462	504	-	-	-	-	-	-	-
Stage 2	612	513	-	536	569	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	14.3		20.1			0			1.1			
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	937	-	-	403	259	840	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.042	0.081	0.033	-	-				
HCM Control Delay (s)	8.8	0	-	14.3	20.1	9.4	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	-	-				

Lanes, Volumes, Timings
2: Site Access & Whistle Bare Road

Existing AM
(230387) 1951 Whistle Bare Road, North Dumfries

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	11	3	2	9	1	7
Future Volume (vph)	11	3	2	9	1	7
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.971				0.882	
Flt Protected				0.991	0.994	
Satd. Flow (prot)	1385	0	0	1370	944	0
Flt Permitted				0.991	0.994	
Satd. Flow (perm)	1385	0	0	1370	944	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	324.4			1506.5	221.1	
Travel Time (s)	14.6			67.8	15.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	67%	0%	22%	0%	71%
Adj. Flow (vph)	11	3	2	9	1	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	0	11	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Site Access & Whistle Bare Road

Existing AM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	3	2	9	1	7
Future Vol, veh/h	11	3	2	9	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	67	0	22	0	71
Mvmt Flow	11	3	2	9	1	7
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	14	0	26	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	-	-	4.1	-	6.4	6.91
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.939
Pot Cap-1 Maneuver	-	-	1617	-	995	898
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1617	-	994	898
Mov Cap-2 Maneuver	-	-	-	-	994	-
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	1014	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.3		9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	909	-	-	1617	-	
HCM Lane V/C Ratio	0.009	-	-	0.001	-	
HCM Control Delay (s)	9	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Lanes, Volumes, Timings

Existing PM

1: Dickie Settlement Road & Whistle Bare Road

(230387) 1951 Whistle Bare Road, North Dumfries

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	4	6	38	1	22	5	468	14	21	424	18
Future Volume (vph)	22	4	6	38	1	22	5	468	14	21	424	18
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.951			0.996			0.995	
Flt Protected		0.967			0.970			0.999			0.998	
Satd. Flow (prot)	0	1215	0	0	1026	0	0	1320	0	0	1377	0
Flt Permitted		0.967			0.970			0.999			0.998	
Satd. Flow (perm)	0	1215	0	0	1026	0	0	1320	0	0	1377	0
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		1506.5			335.8			382.3			397.4	
Travel Time (s)		67.8			15.1			17.2			17.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	14%	25%	33%	32%	100%	45%	20%	14%	64%	76%	7%	17%
Adj. Flow (vph)	22	4	6	38	1	22	5	468	14	21	424	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	61	0	0	487	0	0	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	56.4%											
Analysis Period (min)	15											
ICU Level of Service B												

HCM 6th TWSC
1: Dickie Settlement Road & Whistle Bare Road

Existing PM
(230387) 1951 Whistle Bare Road, North Dumfries

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	22	4	6	38	1	22	5	468	14	21	424	18
Future Vol, veh/h	22	4	6	38	1	22	5	468	14	21	424	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	14	25	33	32	100	45	20	14	64	76	7	17
Mvmt Flow	22	4	6	38	1	22	5	468	14	21	424	18
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	972	967	433	965	969	475	442	0	0	482	0	0
Stage 1	475	475	-	485	485	-	-	-	-	-	-	-
Stage 2	497	492	-	480	484	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.75	6.53	7.42	7.5	6.65	4.3	-	-	4.86	-	-
Critical Hdwy Stg 1	6.24	5.75	-	6.42	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.75	-	6.42	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.225	3.597	3.788	4.9	3.705	2.38	-	-	2.884	-	-
Pot Cap-1 Maneuver	220	232	562	207	176	511	1029	-	-	785	-	-
Stage 1	548	521	-	511	418	-	-	-	-	-	-	-
Stage 2	533	511	-	514	419	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	203	222	562	195	168	511	1029	-	-	785	-	-
Mov Cap-2 Maneuver	203	222	-	195	168	-	-	-	-	-	-	-
Stage 1	544	502	-	507	415	-	-	-	-	-	-	-
Stage 2	505	507	-	486	404	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	22.9		24		0.1		0.4					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1029	-	-	233	250	785	-	-				
HCM Lane V/C Ratio	0.005	-	-	0.137	0.244	0.027	-	-				
HCM Control Delay (s)	8.5	0	-	22.9	24	9.7	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.5	0.9	0.1	-	-				

Lanes, Volumes, Timings
2: Site Access & Whistle Bare Road

Existing PM
(230387) 1951 Whistle Bare Road, North Dumfries

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	23	1	1	20	3	4
Future Volume (vph)	23	1	1	20	3	4
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.994				0.923	
Flt Protected				0.998	0.979	
Satd. Flow (prot)	1346	0	0	1425	1005	0
Flt Permitted				0.998	0.979	
Satd. Flow (perm)	1346	0	0	1425	1005	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	324.4			1506.5	221.1	
Travel Time (s)	14.6			67.8	15.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	100%	100%	10%	33%	75%
Adj. Flow (vph)	23	1	1	20	3	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	0	21	7	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Site Access & Whistle Bare Road

Existing PM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	23	1	1	20	3	4
Future Vol, veh/h	23	1	1	20	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	17	100	100	10	33	75
Mvmt Flow	23	1	1	20	3	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	24	0	46	24
Stage 1	-	-	-	-	24	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	5.1	-	6.73	6.95
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	3.1	-	3.797	3.975
Pot Cap-1 Maneuver	-	-	1134	-	891	876
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	926	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1134	-	890	876
Mov Cap-2 Maneuver	-	-	-	-	890	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	925	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.4		9.1	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	882	-	-	1134	-	
HCM Lane V/C Ratio	0.008	-	-	0.001	-	
HCM Control Delay (s)	9.1	-	-	8.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Appendix C – 2024 Background Traffic Operations Report



Lanes, Volumes, Timings

1: Dickie Settlement Road & Whistle Bare Road

Future Background AM

(230387) 1951 Whistle Bare Road, North Dumfries

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	5	16	5	32	2	405	19	29	211	9
Future Volume (vph)	10	2	5	16	5	32	2	405	19	29	211	9
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.918			0.994			0.995	
Flt Protected		0.971			0.985						0.994	
Satd. Flow (prot)	0	1157	0	0	776	0	0	1351	0	0	1206	0
Flt Permitted		0.971			0.985						0.994	
Satd. Flow (perm)	0	1157	0	0	776	0	0	1351	0	0	1206	0
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		1506.5			335.8			382.3			397.4	
Travel Time (s)		67.8			15.1			17.2			17.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	50%	60%	100%	60%	71%	100%	9%	84%	75%	20%	0%
Adj. Flow (vph)	10	2	5	16	5	32	2	405	19	29	211	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	53	0	0	426	0	0	249	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	51.6%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	2	5	16	5	32	2	405	19	29	211	9
Future Vol, veh/h	10	2	5	16	5	32	2	405	19	29	211	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	50	60	100	60	71	100	9	84	75	20	0
Mvmt Flow	10	2	5	16	5	32	2	405	19	29	211	9
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	711	702	216	696	697	415	220	0	0	424	0	0
Stage 1	274	274	-	419	419	-	-	-	-	-	-	-
Stage 2	437	428	-	277	278	-	-	-	-	-	-	-
Critical Hdwy	7.1	7	6.8	8.1	7.1	6.91	5.1	-	-	4.85	-	-
Critical Hdwy Stg 1	6.1	6	-	7.1	6.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6	-	7.1	6.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.45	3.84	4.4	4.54	3.939	3.1	-	-	2.875	-	-
Pot Cap-1 Maneuver	351	309	698	254	301	513	933	-	-	834	-	-
Stage 1	736	604	-	458	502	-	-	-	-	-	-	-
Stage 2	602	510	-	559	587	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	314	296	698	243	288	513	933	-	-	834	-	-
Mov Cap-2 Maneuver	314	296	-	243	288	-	-	-	-	-	-	-
Stage 1	734	580	-	457	500	-	-	-	-	-	-	-
Stage 2	557	508	-	531	564	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.2		16.6		0		1.1					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	933	-	-	371	364	834	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.046	0.146	0.035	-	-				
HCM Control Delay (s)	8.9	0	-	15.2	16.6	9.5	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0.1	-	-				

Lanes, Volumes, Timings
2: Site Access & Whistle Bare Road

Future Background AM
(230387) 1951 Whistle Bare Road, North Dumfries

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↘↙	
Traffic Volume (vph)	18	0	0	11	0	0
Future Volume (vph)	18	0	0	11	0	0
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1275	0	0	1383	1745	0
Flt Permitted						
Satd. Flow (perm)	1275	0	0	1383	1745	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	170.1			1506.5	221.1	
Travel Time (s)	7.7			67.8	15.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	28%	0%	0%	18%	0%	0%
Adj. Flow (vph)	18	0	0	11	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 6.7%	ICU Level of Service A					
Analysis Period (min) 15						

HCM 6th TWSC
2: Site Access & Whistle Bare Road

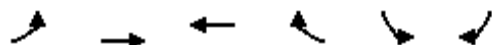
Future Background AM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	18	0	0	11	0	0
Future Vol, veh/h	18	0	0	11	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	28	0	0	18	0	0
Mvmt Flow	18	0	0	11	0	0
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	18	0	29	18
Stage 1	-	-	-	-	18	-
Stage 2	-	-	-	-	11	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1612	-	991	1066
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1017	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1612	-	991	1066
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1017	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	-	-	-	1612	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

Lanes, Volumes, Timings

3: Whistle Bare Road & Grower's Choice Relocation

Future Background AM
(230387) 1951 Whistle Bare Road, North Dumfries



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	11	9	2	7	1
Future Volume (vph)	3	11	9	2	7	1
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975		0.983	
Flt Protected		0.989			0.958	
Satd. Flow (prot)	0	1411	1348	0	1014	0
Flt Permitted		0.989			0.958	
Satd. Flow (perm)	0	1411	1348	0	1014	0
Link Speed (k/h)		80	80		50	
Link Distance (m)		154.3	170.1		149.8	
Travel Time (s)		6.9	7.7		10.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	67%	0%	22%	0%	71%	0%
Adj. Flow (vph)	3	11	9	2	7	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	14	11	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)	100			100	100	100
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 13.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 6th TWSC
3: Whistle Bare Road & Grower's Choice Relocation

Future Background AM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	9	2	7	1
Future Vol, veh/h	3	11	9	2	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	67	0	22	0	71	0
Mvmt Flow	3	11	9	2	7	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	11	0	-	0	27	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	17	-
Critical Hdwy	4.77	-	-	-	7.11	6.2
Critical Hdwy Stg 1	-	-	-	-	6.11	-
Critical Hdwy Stg 2	-	-	-	-	6.11	-
Follow-up Hdwy	2.803	-	-	-	4.139	3.3
Pot Cap-1 Maneuver	1271	-	-	-	837	1077
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	853	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1271	-	-	-	835	1077
Mov Cap-2 Maneuver	-	-	-	-	835	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	853	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.7	0		9.2		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1271	-	-	-	859	
HCM Lane V/C Ratio	0.002	-	-	-	0.009	
HCM Control Delay (s)	7.8	0	-	-	9.2	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Lanes, Volumes, Timings

1: Dickie Settlement Road & Whistle Bare Road

Future Background PM

(230387) 1951 Whistle Bare Road, North Dumfries

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	4	6	22	1	39	5	477	14	21	432	18
Future Volume (vph)	22	4	6	22	1	39	5	477	14	21	432	18
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.915			0.996			0.995	
Flt Protected		0.967			0.983			0.999			0.998	
Satd. Flow (prot)	0	1215	0	0	976	0	0	1321	0	0	1378	0
Flt Permitted		0.967			0.983			0.999			0.998	
Satd. Flow (perm)	0	1215	0	0	976	0	0	1321	0	0	1378	0
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		1506.5			335.8			382.3			397.4	
Travel Time (s)		67.8			15.1			17.2			17.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	14%	25%	33%	32%	100%	45%	20%	14%	64%	76%	7%	17%
Adj. Flow (vph)	22	4	6	22	1	39	5	477	14	21	432	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	62	0	0	496	0	0	471	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	56.7%						ICU Level of Service B					
Analysis Period (min)	15											

HCM 6th TWSC
1: Dickie Settlement Road & Whistle Bare Road

Future Background PM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	4	6	22	1	39	5	477	14	21	432	18
Future Vol, veh/h	22	4	6	22	1	39	5	477	14	21	432	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	14	25	33	32	100	45	20	14	64	76	7	17
Mvmt Flow	22	4	6	22	1	39	5	477	14	21	432	18
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	997	984	441	982	986	484	450	0	0	491	0	0
Stage 1	483	483	-	494	494	-	-	-	-	-	-	-
Stage 2	514	501	-	488	492	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.75	6.53	7.42	7.5	6.65	4.3	-	-	4.86	-	-
Critical Hdwy Stg 1	6.24	5.75	-	6.42	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.75	-	6.42	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.225	3.597	3.788	4.9	3.705	2.38	-	-	2.884	-	-
Pot Cap-1 Maneuver	212	227	556	201	171	505	1022	-	-	778	-	-
Stage 1	543	516	-	505	414	-	-	-	-	-	-	-
Stage 2	522	506	-	509	415	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	188	217	556	190	164	505	1022	-	-	778	-	-
Mov Cap-2 Maneuver	188	217	-	190	164	-	-	-	-	-	-	-
Stage 1	539	497	-	501	411	-	-	-	-	-	-	-
Stage 2	477	502	-	481	400	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	24.2		19.4		0.1		0.4					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1022	-	-	219	311	778	-	-				
HCM Lane V/C Ratio	0.005	-	-	0.146	0.199	0.027	-	-				
HCM Control Delay (s)	8.5	0	-	24.2	19.4	9.8	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.5	0.7	0.1	-	-				

Lanes, Volumes, Timings
2: Site Access & Whistle Bare Road

Future Background PM
(230387) 1951 Whistle Bare Road, North Dumfries

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↘↙	
Traffic Volume (vph)	28	0	0	21	0	0
Future Volume (vph)	28	0	0	21	0	0
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Flt						
Flt Protected						
Satd. Flow (prot)	1305	0	0	1431	1745	0
Flt Permitted						
Satd. Flow (perm)	1305	0	0	1431	1745	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	170.1			1506.5	221.1	
Travel Time (s)	7.7			67.8	15.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	25%	0%	0%	14%	0%	0%
Adj. Flow (vph)	28	0	0	21	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	21	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 6.7%	ICU Level of Service A					
Analysis Period (min) 15						

HCM 6th TWSC
2: Site Access & Whistle Bare Road

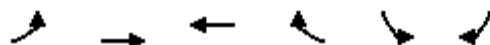
Future Background PM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	0	0	21	0	0
Future Vol, veh/h	28	0	0	21	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	25	0	0	14	0	0
Mvmt Flow	28	0	0	21	0	0
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	28	0	49	28
Stage 1	-	-	-	-	28	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1599	-	965	1053
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1599	-	965	1053
Mov Cap-2 Maneuver	-	-	-	-	965	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	1007	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	-	-	-	1599	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

Lanes, Volumes, Timings

3: Whistle Bare Road & Grower's Choice Relocation

Future Background PM
(230387) 1951 Whistle Bare Road, North Dumfries



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	24	20	1	4	3
Future Volume (vph)	1	24	20	1	4	3
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.994		0.942	
Flt Protected		0.998			0.972	
Satd. Flow (prot)	0	1353	1419	0	1018	0
Flt Permitted		0.998			0.972	
Satd. Flow (perm)	0	1353	1419	0	1018	0
Link Speed (k/h)		80	80		50	
Link Distance (m)		154.3	170.1		149.8	
Travel Time (s)		6.9	7.7		10.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	100%	17%	10%	100%	75%	33%
Adj. Flow (vph)	1	24	20	1	4	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	25	21	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 13.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 6th TWSC
3: Whistle Bare Road & Grower's Choice Relocation

Future Background PM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	24	20	1	4	3
Future Vol, veh/h	1	24	20	1	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	17	10	100	75	33
Mvmt Flow	1	24	20	1	4	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	21	0	0 47 21
Stage 1	-	-	- 21 -
Stage 2	-	-	- 26 -
Critical Hdwy	5.1	-	- 7.15 6.53
Critical Hdwy Stg 1	-	-	- 6.15 -
Critical Hdwy Stg 2	-	-	- 6.15 -
Follow-up Hdwy	3.1	-	- 4.175 3.597
Pot Cap-1 Maneuver	1137	-	- 807 974
Stage 1	-	-	- 842 -
Stage 2	-	-	- 837 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1137	-	- 806 974
Mov Cap-2 Maneuver	-	-	- 806 -
Stage 1	-	-	- 841 -
Stage 2	-	-	- 837 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1137	-	-	-	870
HCM Lane V/C Ratio	0.001	-	-	-	0.008
HCM Control Delay (s)	8.2	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Appendix D – 2024 Total Traffic Operations Report



Lanes, Volumes, Timings

Future Total AM

1: Dickie Settlement Road & Whistle Bare Road

(230387) 1951 Whistle Bare Road, North Dumfries

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	3	11	16	6	32	8	405	19	29	211	15
Future Volume (vph)	16	3	11	16	6	32	8	405	19	29	211	15
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.950			0.920			0.994			0.992	
Flt Protected		0.974			0.985			0.999			0.994	
Satd. Flow (prot)	0	1117	0	0	779	0	0	1335	0	0	1208	0
Flt Permitted		0.974			0.985			0.999			0.994	
Satd. Flow (perm)	0	1117	0	0	779	0	0	1335	0	0	1208	0
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		1506.5			335.8			382.3			397.4	
Travel Time (s)		67.8			15.1			17.2			17.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	50%	60%	100%	60%	71%	100%	9%	84%	75%	20%	0%
Adj. Flow (vph)	16	3	11	16	6	32	8	405	19	29	211	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	54	0	0	432	0	0	255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.6%											
Analysis Period (min)	15											
	ICU Level of Service A											

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	16	3	11	16	6	32	8	405	19	29	211	15
Future Vol, veh/h	16	3	11	16	6	32	8	405	19	29	211	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	50	60	100	60	71	100	9	84	75	20	0
Mvmt Flow	16	3	11	16	6	32	8	405	19	29	211	15
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	727	717	219	715	715	415	226	0	0	424	0	0
Stage 1	277	277	-	431	431	-	-	-	-	-	-	-
Stage 2	450	440	-	284	284	-	-	-	-	-	-	-
Critical Hdwy	7.1	7	6.8	8.1	7.1	6.91	5.1	-	-	4.85	-	-
Critical Hdwy Stg 1	6.1	6	-	7.1	6.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6	-	7.1	6.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.45	3.84	4.4	4.54	3.939	3.1	-	-	2.875	-	-
Pot Cap-1 Maneuver	342	303	695	246	294	513	928	-	-	834	-	-
Stage 1	734	602	-	450	495	-	-	-	-	-	-	-
Stage 2	592	504	-	553	583	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	303	288	695	231	279	513	928	-	-	834	-	-
Mov Cap-2 Maneuver	303	288	-	231	279	-	-	-	-	-	-	-
Stage 1	726	578	-	445	490	-	-	-	-	-	-	-
Stage 2	542	498	-	520	560	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	15.3		17			0.2			1.1			
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	928	-	-	380	353	834	-	-				
HCM Lane V/C Ratio	0.009	-	-	0.079	0.153	0.035	-	-				
HCM Control Delay (s)	8.9	0	-	15.3	17	9.5	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0.1	-	-				

Lanes, Volumes, Timings
2: Site Access & Whistle Bare Road

Future Total AM
(230387) 1951 Whistle Bare Road, North Dumfries

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↘↗	
Traffic Volume (vph)	18	0	13	11	0	13
Future Volume (vph)	18	0	13	11	0	13
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected	0.974					
Satd. Flow (prot)	1275	0	0	1468	1510	0
Flt Permitted	0.974					
Satd. Flow (perm)	1275	0	0	1468	1510	0
Link Speed (k/h)	80	80			50	
Link Distance (m)	170.1	1506.5			221.1	
Travel Time (s)	7.7	67.8			15.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	28%	0%	0%	18%	0%	0%
Adj. Flow (vph)	18	0	13	11	0	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	24	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0	0.0			3.5	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)	15		25	25		15
Sign Control	Free	Free			Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Site Access & Whistle Bare Road

Future Total AM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection

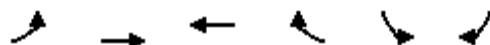
Int Delay, s/veh 3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	18	0	13	11	0	13
Future Vol, veh/h	18	0	13	11	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	28	0	0	18	0	0
Mvmt Flow	18	0	13	11	0	13

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	18
Stage 1	-	-	18
Stage 2	-	-	37
Critical Hdwy	-	4.1	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	2.2	3.5
Pot Cap-1 Maneuver	-	1612	958
Stage 1	-	-	1010
Stage 2	-	-	991
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1612	950
Mov Cap-2 Maneuver	-	-	950
Stage 1	-	-	1010
Stage 2	-	-	983

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1066	-	-	1612	-
HCM Lane V/C Ratio	0.012	-	-	0.008	-
HCM Control Delay (s)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	11	9	2	7	1
Future Volume (vph)	3	11	9	2	7	1
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975		0.983	
Flt Protected		0.989			0.958	
Satd. Flow (prot)	0	1411	1348	0	1014	0
Flt Permitted		0.989			0.958	
Satd. Flow (perm)	0	1411	1348	0	1014	0
Link Speed (k/h)		80	80		50	
Link Distance (m)		154.3	170.1		149.8	
Travel Time (s)		6.9	7.7		10.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	67%	0%	22%	0%	71%	0%
Adj. Flow (vph)	3	11	9	2	7	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	14	11	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)	100			100	100	100
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.7% ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
3: Whistle Bare Road & Grower's Choice Relocation

Future Total AM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	9	2	7	1
Future Vol, veh/h	3	11	9	2	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	67	0	22	0	71	0
Mvmt Flow	3	11	9	2	7	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	11	0	0 27 10
Stage 1	-	-	- 10 -
Stage 2	-	-	- 17 -
Critical Hdwy	4.77	-	- 7.11 6.2
Critical Hdwy Stg 1	-	-	- 6.11 -
Critical Hdwy Stg 2	-	-	- 6.11 -
Follow-up Hdwy	2.803	-	- 4.139 3.3
Pot Cap-1 Maneuver	1271	-	- 837 1077
Stage 1	-	-	- 860 -
Stage 2	-	-	- 853 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1271	-	- 835 1077
Mov Cap-2 Maneuver	-	-	- 835 -
Stage 1	-	-	- 858 -
Stage 2	-	-	- 853 -

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1271	-	-	-	859
HCM Lane V/C Ratio	0.002	-	-	-	0.009
HCM Control Delay (s)	7.8	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Lanes, Volumes, Timings

Future Total PM

1: Dickie Settlement Road & Whistle Bare Road

(230387) 1951 Whistle Bare Road, North Dumfries

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	5	12	22	2	39	11	477	14	21	432	24
Future Volume (vph)	28	5	12	22	2	39	11	477	14	21	432	24
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.964			0.916			0.996			0.993	
Flt Protected		0.970			0.983			0.999			0.998	
Satd. Flow (prot)	0	1192	0	0	971	0	0	1320	0	0	1374	0
Flt Permitted		0.970			0.983			0.999			0.998	
Satd. Flow (perm)	0	1192	0	0	971	0	0	1320	0	0	1374	0
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		1506.5			335.8			382.3			397.4	
Travel Time (s)		67.8			15.1			17.2			17.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	14%	25%	33%	32%	100%	45%	20%	14%	64%	76%	7%	17%
Adj. Flow (vph)	28	5	12	22	2	39	11	477	14	21	432	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	0	0	63	0	0	502	0	0	477	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	54.7%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	5	12	22	2	39	11	477	14	21	432	24
Future Vol, veh/h	28	5	12	22	2	39	11	477	14	21	432	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	14	25	33	32	100	45	20	14	64	76	7	17
Mvmt Flow	28	5	12	22	2	39	11	477	14	21	432	24
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1013	999	444	1001	1004	484	456	0	0	491	0	0
Stage 1	486	486	-	506	506	-	-	-	-	-	-	-
Stage 2	527	513	-	495	498	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.75	6.53	7.42	7.5	6.65	4.3	-	-	4.86	-	-
Critical Hdwy Stg 1	6.24	5.75	-	6.42	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.75	-	6.42	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.225	3.597	3.788	4.9	3.705	2.38	-	-	2.884	-	-
Pot Cap-1 Maneuver	207	222	554	195	166	505	1016	-	-	778	-	-
Stage 1	541	514	-	497	408	-	-	-	-	-	-	-
Stage 2	513	500	-	504	412	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	182	211	554	180	158	505	1016	-	-	778	-	-
Mov Cap-2 Maneuver	182	211	-	180	158	-	-	-	-	-	-	-
Stage 1	533	495	-	490	402	-	-	-	-	-	-	-
Stage 2	464	493	-	471	397	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	24.8		20.4		0.2		0.4					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1016	-	-	226	297	778	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.199	0.212	0.027	-	-				
HCM Control Delay (s)	8.6	0	-	24.8	20.4	9.8	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.7	0.8	0.1	-	-				

Lanes, Volumes, Timings
2: Site Access & Whistle Bare Road

Future Total PM
(230387) 1951 Whistle Bare Road, North Dumfries

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↗	↘
Traffic Volume (vph)	28	0	13	21	0	13
Future Volume (vph)	28	0	13	21	0	13
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected				0.981		
Satd. Flow (prot)	1305	0	0	1473	1510	0
Flt Permitted				0.981		
Satd. Flow (perm)	1305	0	0	1473	1510	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	170.1			1506.5	221.1	
Travel Time (s)	7.7			67.8	15.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	25%	0%	0%	14%	0%	0%
Adj. Flow (vph)	28	0	13	21	0	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	34	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Site Access & Whistle Bare Road

Future Total PM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection

Int Delay, s/veh 2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	0	13	21	0	13
Future Vol, veh/h	28	0	13	21	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	25	0	0	14	0	0
Mvmt Flow	28	0	13	21	0	13

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	28
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	4.1	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	2.2	-
Pot Cap-1 Maneuver	-	1599	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1599	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1053	-	-	1599	-
HCM Lane V/C Ratio	0.012	-	-	0.008	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	24	20	1	4	3
Future Volume (vph)	1	24	20	1	4	3
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.994		0.942	
Flt Protected		0.998			0.972	
Satd. Flow (prot)	0	1353	1419	0	1018	0
Flt Permitted		0.998			0.972	
Satd. Flow (perm)	0	1353	1419	0	1018	0
Link Speed (k/h)		80	80		50	
Link Distance (m)		154.3	170.1		149.8	
Travel Time (s)		6.9	7.7		10.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	100%	17%	10%	100%	75%	33%
Adj. Flow (vph)	1	24	20	1	4	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	25	21	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
3: Whistle Bare Road & Grower's Choice Relocation

Future Total PM
(230387) 1951 Whistle Bare Road, North Dumfries

Intersection

Int Delay, s/veh 1.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations 

Traffic Vol, veh/h 1 24 20 1 4 3

Future Vol, veh/h 1 24 20 1 4 3

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length - - - - 0 -

Veh in Median Storage, # - 0 0 - 0 -

Grade, % - 0 0 - 0 -

Peak Hour Factor 100 100 100 100 100 100

Heavy Vehicles, % 100 17 10 100 75 33

Mvmt Flow 1 24 20 1 4 3

Major/Minor Major1 Major2 Minor2

Conflicting Flow All 21 0 - 0 47 21

Stage 1 - - - - 21 -

Stage 2 - - - - 26 -

Critical Hdwy 5.1 - - - 7.15 6.53

Critical Hdwy Stg 1 - - - - 6.15 -

Critical Hdwy Stg 2 - - - - 6.15 -

Follow-up Hdwy 3.1 - - - 4.175 3.597

Pot Cap-1 Maneuver 1137 - - - 807 974

Stage 1 - - - - 842 -

Stage 2 - - - - 837 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver 1137 - - - 806 974

Mov Cap-2 Maneuver - - - - 806 -

Stage 1 - - - - 841 -

Stage 2 - - - - 837 -

Approach EB WB SB

HCM Control Delay, s 0.3 0 9.2

HCM LOS A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h) 1137 - - - 870

HCM Lane V/C Ratio 0.001 - - - 0.008

HCM Control Delay (s) 8.2 0 - - 9.2

HCM Lane LOS A A - - A

HCM 95th %tile Q(veh) 0 - - - 0