TRAFFIC IMPACT ASSESSMENT

PROPOSED MIXED-USE DEVELOPMENT Concord, New Hampshire

May 2021

Prepared for

Nobis Group

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Transportation: Engineering • Planning • Design

TRAFFIC IMPACT ASSESSMENT PROPOSED MIXED-USE DEVELOPMENT CONCORD, NEW HAMPSHIRE MAY 3, 2021

INTRODUCTION

This study has been prepared for the Nobis Group, on behalf of their client Dakota Partners, to assess the traffic impacts associated with the proposed mixed-use development that will be located on the south side of Langdon Avenue in Concord, New Hampshire. The subject site was formerly occupied by the Concord B & M railroad shops. A traffic study "scope" meeting was conducted with city officials on April 12, 2021. At that meeting the study area was identified as including the South Main Street/Langdon Avenue intersection, and the analysis periods included the weekday morning (AM) and the weekday evening (PM) peak hour periods. Both Opening Year (2023) and Horizon Year (2033) traffic projections and analyses are included herein.

This report is intended to summarize the traffic count data collected, the future traffic projections, the technical analyses, and our findings relative to traffic operations, capacity, and safety.

PROPOSAL

According to the plan entitled "Comprehensive Development Pan" dated March 2021, by Nobis Group for the property located on Langdon Avenue (see Appendix A), the proposed development consists of 192 residential apartments and 66,000 sf of office space. Vehicular access to the site will be provided via a two two-way driveways that will intersect the south side of Langdon Avenue. The west site driveway (located approximately 400-feet east of South Main Street will provide access to the residential portion of the development and the east site driveway (located approximately 620-feet east of South Main Street) will provide access to the commercial portion.

Figure 1 shows the location of the subject site with respect to the area roadway system, the traffic count location, and the closest NHDOT short-term automatic traffic recorder count station on South Main Street.

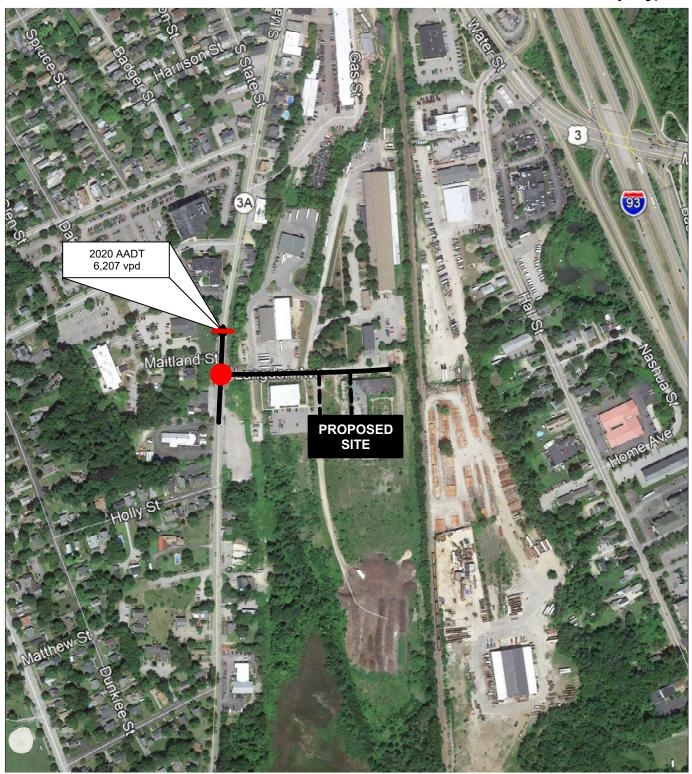
EXISTING CONDITIONS

ROADWAYS

South Main Street, also known as NH Route 3A, functions as a minor arterial roadway with a general north-south orientation in the study area; it carries through vehicles between downtown Concord to the north, past Langdon Avenue and the subject site, to Bow and points south. This roadway will be utilized by all residents, employees and delivery vehicles traveling to/from the site. The section south of Langdon Avenue measures approximately 38-feet in width, and it is delineated with a double-yellow centerline and single white edge lines. The horizontal alignment of South Main Street is essentially straight, and the vertical alignment follows a rolling terrain



Pernaw & Company, Inc.



= AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)

= INTERSECTION TURNING MOVEMENT COUNT LOCATION

NORTH



with a slight uphill grade in the northbound direction in this area. The speed limit is posted at 30 mph in both directions.

Langdon Avenue is a private two-lane roadway that extends in an easterly direction from its intersection with South Main Street, and has no outlet. This roadway provides access to several businesses along the roadway, as well as several located at 287 South Main Street. The width of Langdon Avenue measures approximately 36-feet (east of South Main Street). The horizontal alignment of Langdon Avenue is relatively straight and the vertical alignment exhibits an uphill grade of approximately +7% approaching South Main Street. There are no pavement markings and no posted speed limit present on Langdon Avenue.

INTERSECTIONS

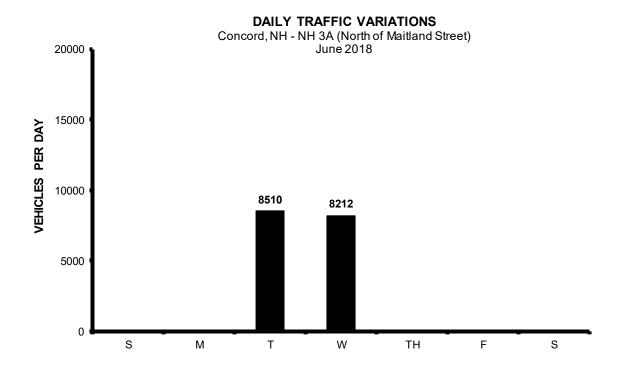
The **South Main Street/Langdon Avenue** intersection essentially operates as a typical three-leg "T" unsignalized intersection. Each approach to this intersection provides a single approach lane from which all applicable movements occur. There are no pavement markings or traffic control devices present on the Langdon Avenue approach to South Main Street.

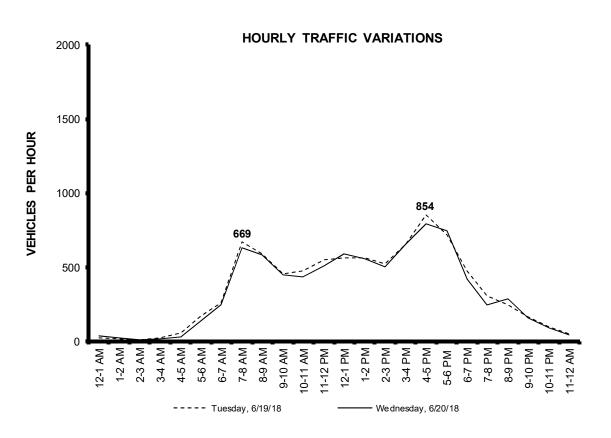
TRAFFIC VOLUMES

The New Hampshire Department of Transportation conducted a short-term automatic traffic recorder count in June 2018 on South Main Street, north of Maitland Street. This count station is located approximately 200-feet north of Langdon Avenue. The count data indicates that this section of South Main Street carried an Annual Average Daily Traffic (AADT) volume of 6,207 vehicles per day (vpd) in 2020, down considerably from 7,354 vpd in 2019.

These AADT estimates were derived from a two-day traffic count conducted in 2018. This data demonstrates that traffic demand on South Main Street (NH3A) generally reaches peak levels during the typical AM and PM commuter periods on weekdays. The daily and hourly variations in traffic demand at this count station are illustrated graphically on Page 4. Appendix B contains the detail sheet pertaining to this count.





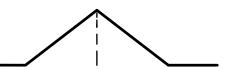




To establish the current traffic demand at the subject intersection, Pernaw & Company, Inc. conducted turning movement and vehicle classification counts on South Main Street at the Langdon Avenue intersection on Wednesday, April 14, 2021 and again on Thursday, April 15, 2021 from 7:00 to 9:00 AM and from 3:00 to 6:00 PM. The traffic volumes on Wednesday generally exceeded those on Thursday, and were therefore selected for traffic projection purposes. Several facts and conclusions are evident from this count data:

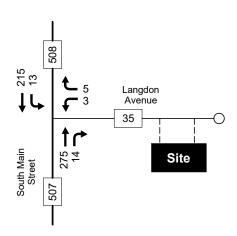
- Peak traffic periods on South Main Street were found to occur from 7:30 to 8:30 AM in the morning and from 4:30 to 5:30 PM in the evening. The traffic flow entering the intersection totaled 525 vehicles (AM) and 697 vehicles (PM) during the peak hour periods.
- During the morning peak hour, the majority of traffic traveled in the northbound (57%) direction on South Main Street, and during the evening peak hour the majority of the traffic traveled in the southbound (63%) direction on South Main Street.
- Langdon Avenue, accommodated 35 (AM) and 56 (PM) vehicles during the peak hour periods. Overall, the majority of these vehicles traveled to/from points north on South Main Street.
- Truck traffic on South Main Street accounted for approximately 4% (AM) and 0% (PM) of the total traffic flow passing the site during the peak hour periods.

The peak hour traffic count data for the study area intersection is summarized on Figure 2. Appendix C contains the detail sheets from the turning movement counts.

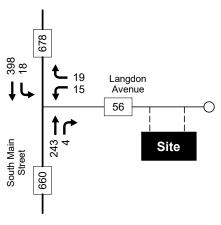


Pernaw & Company, Inc

WEDNESDAY

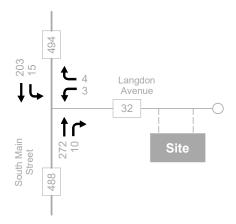


AM PEAK HOUR Wednesday, April 14, 2021 7:30 to 8:30 AM

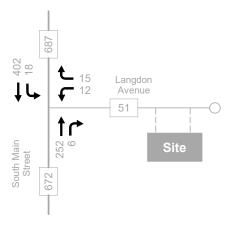


PM PEAK HOUR Wednesday, April 14, 2021 4:30 to 5:30 PM

THURSDAY



AM PEAK HOUR Thursday, April 15, 2021 7:30 to 8:30 AM



PM PEAK HOUR Thursday, April 15, 2021 4:30 to 5:30 PM

Figure 2



CRASH HISTORY

Crash data from the City of Concord Police Department for the most recent three-year period (2018-2020, plus part of 2021) was researched to identify crash rates and patterns in the study area. Over the three-year plus period, the crash listing indicates that two reported crashes occurred at the South Main Street/Langdon Avenue intersection. This crash data is contained in Appendix D.

Each of the two collisions involved two vehicles, and resulted in property damage only. Inclement weather or unfavorable surface conditions do not appear to be a contributing factor in either of the crashes. The data indicates that one driver was distracted, and another driver was following to close. Both crashes occurred during daylight hours.

No fatalities were reported in this study group. The following table summarizes the available crash data in terms of frequency, severity, and collision type.

Crash Summary (1/1/18-4/12/21)¹ South Main Street / Langdon Avenue CRASH FREQUENCY 2 **Total Crashes** Crashes per Year (Ave) 0.62 CRASH SEVERITY Property Damage Only 2 Personal Injury 0 Fatalities 0 **CRASH TYPE** Angle/Cross Movement 0 Rear End 1 Distracted 1 Fixed Object 0 Pedestrian 0 Unknow n 0

(0) 0%

ADVERSE CONDITIONS (%)

¹ Source: City of Concord (Police Department)



NO-BUILD TRAFFIC VOLUMES

In order to identify the net impact that site traffic will have in the study area, future traffic projections with and without the proposed mixed-use development are necessary. The future traffic projections without the proposed mixed-use development are referred to as the "No-Build" traffic projections, and these are summarized on Figure 3.

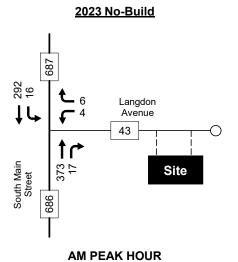
These projections are based on the existing traffic volumes (April 2021 data) using the higher of the two count days, a 1.0 percent annual background traffic growth rate (compounded annually) to account for regional growth in the area, a peak-month seasonal adjustment factor of 1.10 (to reflect peak-month conditions) and Covid-19 adjustment factors of 1.21 (AM) and 1.14 (PM) to reflect non-pandemic conditions. Calculations pertaining to the derivation of the background traffic growth rate, the seasonal adjustment factor and the Covid-19 factors are contained in Appendix E.

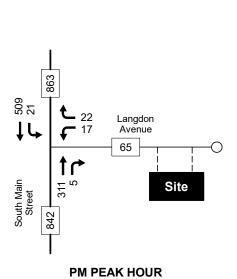
At the scoping meeting no other known development projects of significant size were identified that had the potential to affect this study area. The No-Build traffic projections therefore reflect worst-case, peak-month, peak-hour conditions without a pandemic.



Pernaw & Company, Inc

Site





6 Langdon 4 Avenue

2033 No-Build

323 16

South Main Street

AM PEAK HOUR

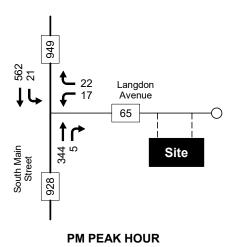


Figure 3



SITE GENERATED TRAFFIC

To estimate the quantity of vehicle trips that will be produced by the proposed mixed-use development, Pernaw & Company, Inc. considered the standardized trip-generation equations published by the Institute of Transportation Engineers (ITE)¹. The most applicable land use categories are Land Use Code (LUC) 221 – Multifamily Housing (Mid-Rise) for the residential portion and LUC 710 – General Office Building for the commercial portion. The following table summarizes the results of the trip generation analyses.

Table 1		Tri	p Generation S	Summary	
		General Office Building ¹ (48,000 sf)	General Office Building ¹ (18,000 sf)	Multi-Family Housing ² (192 Units)	Total
Weekday (24 Ho	our)				
	Entering Exiting Total	261 veh <u>261</u> <u>veh</u> 522 trips	101 veh 101 veh 202 trips	523 veh 523 veh 1046 trips	885 trips <u>885</u> trips 1770 trips
AM Peak Hour					
	Entering Exiting Total	62 veh <u>10</u> <u>veh</u> 72 trips	37 veh <u>6</u> <u>veh</u> 43 trips	17 veh <u>48 veh</u> 65 trips	116 trips <u>64</u> <u>trips</u> 180 trips
PM Peak Hour					
	Entering Exiting Total	9 veh <u>48 veh</u> 57 trips	4 veh 18 <u>veh</u> 22 trips	51 veh <u>32 veh</u> 83 trips	64 trips 98 trips 162 trips

¹ ITE Land Use Code 710 - General Office Building - Trip Equation Method

The trip generation analysis is summarized on Table 1 and shows that the proposed mixed-use development will generate approximately 180 vehicle-trips (116 arrivals, 64 departures) during the AM peak hour period, and approximately 162 vehicle-trips (64 arrivals, 98 departures) during the PM peak hour period, on an average weekday basis. These types of uses generate "primary" type trips, which involve new trips to the area. Appendix F contains the trip generation computations for this project.

 $^{^2}$ ITE Land Use Code 221- Multifamily Housing (Mid-Rise) - Trip Equation Method

¹ Institute of Transportation Engineers, *Trip Generation*, tenth edition (Washington, D.C., 2017)



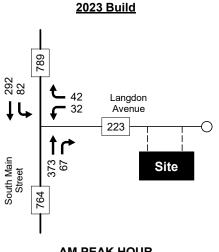
BUILD TRAFFIC VOLUMES

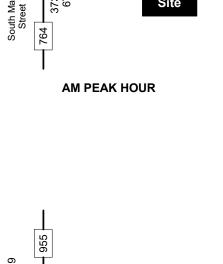
The future traffic projections with the proposed mixed-use development in full operation are referred to as the "Build" traffic projections, and these are summarized schematically on Figure 4. These projections are based on the No-Build projections (Figure 3), the site generated traffic levels depicted in Table 1, and the expectation that the majority of the vehicles (57%) will travel to/from points north on South Main Street. The trip distribution analysis was based on an analysis of the traffic count data that was collected on both count days (ten hours total).

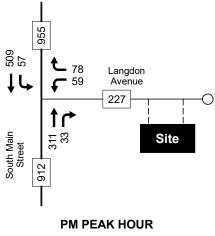
Appendix F also contains the trip distribution computations and a diagram that summarizes the distribution of the primary trips at the study area intersection.



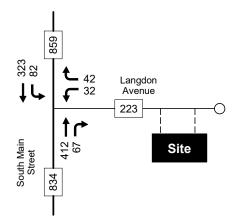
Pernaw & Company, Inc



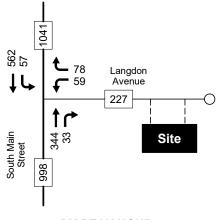




2033 Build



AM PEAK HOUR



PM PEAK HOUR



IMPACT SUMMARY

TRAFFIC VOLUME INCREASES

The net impact that the proposed mixed-use development project will have on traffic levels on South Main Street can be estimated by comparing the No-Build traffic projections with the Build traffic projections. This comparison demonstrates the greatest impact to <u>roadway volumes</u> on South Main Street during the worst-case 2023 weekday PM peak hour period will occur north of Langdon Avenue where traffic volumes are projected to increase by approximately +11%, or by approximately +92 (PM) vehicles north of the site. The impacts south of the site will be less.

During the AM peak hour period, when traffic volumes on South Main Street are lower than during the PM peak hour, the impact north of Langdon Avenue is estimated at approximately 15%, or by approximately +102 vehicles. To put these increases into perspective, the two-day NHDOT traffic count on South Main Street revealed that random traffic flow from one day to the next varied by as much as +8% during the PM peak hour period. A longer duration count would likely show even greater changes percentagewise on a day-to-day basis. Impacts beyond the immediate study area will dissipate as drivers turn at various intersections along the South Main Street corridor.



TRAFFIC OPERATIONS AND SAFETY

INTERSECTION CAPACITY - UNSIGNALIZED INTERSECTIONS

The short-range (2023) and long-range (2033) traffic projections form the basis for assessing traffic operations at the South Main Street/Langdon Avenue intersection. This intersection was analyzed according to the methodologies of the *Highway Capacity Manual* as replicated by the latest edition of the *Synchro Traffic Signal Coordination Software (Version 10)*, which also performs unsignalized intersection capacity analyses.

Capacity and Level of Service (LOS) calculations pertaining to unsignalized intersections address the quality of service for those vehicles turning into and out of intersecting side streets. The availability of adequate gaps in the traffic stream on the major street (South Main Street) actually controls the potential capacity for vehicle movements from the minor approach (Langdon Avenue). Levels of Service are simply letter grades (A-F) that categorize the vehicle delays associated with specific turning maneuvers. Table 2 describes the criteria used in this analysis.

Table 2		ice Criteria for Intersections
Control Delay	Level of Service by V	olume-to-Capacity Ratio
(seconds/vehicle)	<u>v/c ≤ 1.0</u>	v/c > 1.0
0 - 10	Α	F
> 10 - 15	В	F
> 15 - 25	С	F
> 25 - 35	D	F
> 35 - 50	E	F
> 50	F	F

Source: Transportation Research Board, Highway Capacity Manual 2010.

The results of the analysis for the **South Main Street / Langdon Avenue** intersection are summarized on Table 3. The analysis demonstrates that all applicable turning movements at this intersection will operate well <u>below</u> capacity and at LOS E or higher during all hours of the day through 2033 and beyond. Vehicle queuing (95th percentile) on South Main Street for southbound left-turn arrivals at Langdon Avenue is estimated at 0.0 - 0.3 vehicles during both peak hour periods. Vehicle queuing on the Langdon Avenue approach to South Main Street is expected to increase from 1 to 3 vehicles on the shared left-right departure lane during the worst-case PM peak hour period in 2033.

Appendix G contains the computations pertaining to the unsignalized intersection capacity analyses.



Table 3

STOP-Controlled Intersection Capacity Analysis South Main Street / Langdon Avenue

	W	eekday Al	M Peak Ho	our	W	/eekday Pt	VI Peak Ho	ur
	Delay 1	V/C ²	LOS ³	Queue 4	Delay 1	V/C ²	LOS ³	Queue 4
Langdon Avenue - WB LT & RT Departures								
2021 Existing	12.7	0.03	В	<1	12.7	0.09	В	<1
2023 No Build	15.3	0.05	С	<1	15.0	0.12	С	<1
2023 Build	29.8	0.51	D	3	24.6	0.50	С	3
2033 No Build	16.5	0.06	С	<1	16.3	0.14	С	1
2033 Build	36.2	0.57	E	3	29.6	0.56	D	3
South Main Street - SB LT Arrivals								
2021 Existing	8.1	0.01	Α	<1	7.8	0.02	Α	<1
2023 No Build	8.5	0.02	Α	<1	8.0	0.02	Α	<1
2023 Build	9.1	0.10	Α	<1	8.2	0.06	Α	<1
2033 No Build	8.7	0.02	Α	<1	8.1	0.02	Α	<1
2033 Build	9.3	0.11	Α	<1	8.3	0.06	Α	<1

¹ HCM Control Delay (seconds per vehicle), ² HCM Volume to Capacity Ratio, ³ HCM Level of Service, ⁴ HCM 95th Percentile Queue (vehicles)



AUXILIARY TURN LANE ANALYSES

Left-Turn Treatment - The type of treatment needed to accommodate left-turning vehicles from any street or highway to an intersecting side street (or driveway) can range from no treatment, where turning volumes are low; to the provision of a bypass lane for through traffic to travel around left-turning vehicles; to the addition of a formal center turn lane used exclusively by left-turning vehicles for deceleration and storage while waiting to complete their maneuvers.

Analysis of the 2023 Opening Year traffic volumes using NCHRP 457 guidelines indicates that providing left-turn treatment is advisable on South Main Street to accommodate left-turn arrivals on to Langdon Avenue. Fortunately, there is adequate distance between the existing double-yellow centerline and the edge of pavement on South Main Street for through vehicles to bypass any left-turning vehicles destined for Langdon Avenue. The results of this analysis are summarized on Table 4 and the computations are included in Appendix H.

Right-Turn Treatment - The type of treatment needed to accommodate right-turning vehicles from any street or highway to any intersecting side street (or driveway) can range from a radius only, where turning volumes are low; to the provision of a short 10:1 right-turn taper; to the addition of an exclusive right-turn lane, where turning volumes and through traffic volumes are significant.

Analysis of the 2033 Horizon Year traffic volume projections using NCHRP 457 guidelines confirmed that right-turn treatment is <u>not</u> necessary on the northbound South Main Street approach to Langdon Avenue. This means that the existing northbound travel lane on South Main Street will continue to function adequately as a shared through-right lane for anticipated traffic volumes. The results of these analyses are also summarized on Table 4 and the computations are included in Appendix H.

Minor-Road Approach Analysis – The type of treatment needed to accommodate exiting vehicles from the minor-road approach at a stop-controlled intersection can range from a single lane (shared left-right lane) in low-volume conditions, to two exit lanes (exclusive left-turn lane and exclusive right-turn lane) where turning volumes and through traffic volumes are significant, to multiple exit lanes in extreme cases.

Analysis of the 2033 Horizon Year traffic volumes using NCHRP 457 guidelines confirmed that one departure lane on the Langdon Avenue approach to South Main Street is sufficient for the anticipated traffic volumes. The results of these analyses are summarized on Table 4 and the computations are included in Appendix H.



Table 4

Auxiliary Turn Lane Warrants Analysis South Main Street / Langdon Avenue

	No-Buil	d Cases	Build	Cases
	2023 AM No-Build Volumes	2023 PM No-Build Volumes	2023 AM Build Volumes	2023 PM Build Volumes
I. LEFT-TURN LANE WARRANTS ANALYSIS (2023 & 2033) Peak Hour Inputs:				
Left-Turn Volume (SB) Advancing Volume (SB) Opposing Volume (NB) Percent Lefts Speed (mph) Limiting Advancing Volume (veh/h) Left-Turn Treatment Warranted?	16 308 390 5.2% 30 562	21 530 316 4.0% 30 689	82 374 440 21.9% 30 286 YES	57 566 334 10.1% 30 439
II. RIGHT-TURN LANE WARRANTS ANALYSIS (2033) Peak Hour Inputs:			2033 AM Build Volumes	2033 PM Build Volumes
Right-Turn Volume (NB) Approach Volume (NB) Speed (mph)	- - -	- - -	67 479 30	33 377 30
Limiting Right-Turn Volume (veh/h)	-	-	678	>1000
Add Right-Turn Bay?	-	-	NO	NO
III. MINOR-ROAD APPROACH GEOMETRY ANALYSIS (2033) Peak Hour Inputs:			2033 AM Build Volumes	2033 PM Build Volumes
Major-Road Volume (NB-SB) % Right-Turns on Minor (WB) Minor-Road Approach Volume	- - -	- - -	884 57 74	996 57 137
Limiting Minor-Road Volume (veh/h)	-	-	250	221
Consider TWO Approach Lanes?	-	-	NO	NO



SIGHT DISTANCE

Sight distance at any intersection is an important safety consideration. The operator of a vehicle approaching an intersection should have an unobstructed view of the intersection and sufficient length of roadway to enable a full stop, should it be required to avoid a collision. Similarly, exiting vehicles from the Langdon Avenue approach to South Main Street should have sufficient visibility of approaching traffic in order to safely enter the traffic flow on to the major street.

Field observations confirmed that ample stopping sight distances (SSD) currently exist looking left and looking right from the Langdon Avenue approach to South Main Street. This means that approaching drivers have sufficient sight distance to anticipate and avoid collisions.

Photographs depicting the available sight distances looking left and looking right from the Langdon Avenue approach to South Main Street are included in Appendix I.

PUBLIC TRANSIT SYSTEM

The Concord Area Transit website provided bus routes and schedules. According to this information, bus service is not provided in this area. The closest bus stop to Langdon Avenue is located at St. John's Church on S. Main Street, approximately 0.6 mi. to the north.



STUDY FINDINGS AND RECOMMENDATIONS

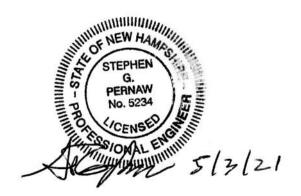
Based upon the existing conditions data collected on South Main Street, the anticipated traffic volume increases associated with the proposed mixed-use development, and the analysis of future traffic conditions at this study area intersection, Pernaw & Company, Inc. finds that:

- 1. The traffic counts conducted by Pernaw & Company, Inc. at the Langdon Avenue intersection on South Main Street in April 2021 revealed that the peak traffic hours occurred from 7:30 to 8:30 AM and from 4:30 to 5:30 PM on a typical weekday. During these periods, 525 vehicles (AM) and 697 vehicles (PM) were observed entering the subject intersection.
- 2. The trip generation analysis revealed that, on an average weekday basis, the proposed mixed-use development will generate approximately 180 vehicle-trips (116 arrivals, 64 departures) during the AM peak hour, and 162 vehicle-trips (64 arrivals, 98 departures) during the PM peak hour period. Based on the travel patterns observed at the subject intersection, it is reasonable to expect that the majority of site traffic (approximately 57%) will travel to/from points north on South Main Street.
- 3. The result of the analysis of the traffic operations at the South Main Street/Langdon Avenue intersection confirmed that all applicable turning movements will operate well <u>below</u> capacity through the 2033 Horizon Year with the site fully operational. Left-turn arrivals from South Main Street will continue to operate at Level of Service A during all hours of the day. Departures from Langdon Avenue will operate at Level of Service D (2023) and Level of Service E (2033) or better during the morning and evening peak hour periods. Vehicle queuing on the Langdon Avenue approach is estimated at three vehicles during the peak hour periods.
- 4. The left-turn lane warrants analyses contained herein indicates that left-turn treatment is desirable for southbound vehicles turning left onto Langdon Avenue. Fortunately, there is adequate pavement width for through vehicles to travel around left-turning vehicles. This means the existing southbound shoulder area on South Main Street will continue to function adequately as a bypass lane.
- 5. The right-turn lane warrants analyses indicate that no special treatment is needed for northbound vehicles entering Langdon Avenue. This means that the existing northbound travel lane on South Main Street will function adequately as a shared through-right lane.
- 6. The minor-road approach geometry analysis indicates that one departure lane is sufficient on the Langdon Avenue approach to South Main Street through 2033 with the subject site fully occupied.
- 7. The proposed site driveways on Langdon Avenue should operate under STOP sign control (MUTCD R1-1) and be delineated with a 12 to 24-inch white stop line, and a short section of 4-inch double-yellow centerline to separate inbound and outbound vehicles.



- 8. STOP sign control should also be installed on the Langdon Avenue approach to South Main Street, along with similar pavement markings.
- 9. Ample sight distances currently exist looking left and right from the Langdon Avenue approach on South Main Street. Placement of any future signs and/or plantings in the vicinity of this intersection should not restrict the view of approaching vehicles on South Main Street.

With the installation of the recommended traffic control devices and maintaining clear "sight distance triangles" on the proposed site driveway approaches to Langdon Avenue, vehicular access and egress should be reasonably safe and efficient from a transportation engineering standpoint for the size and type of development that is proposed.



APPENDIX

Appendix A Comprehensive Development Plan

Appendix B Automatic Traffic Recorder Counts

Appendix C Intersection Turning Movement Counts

Appendix D Crash Data

Appendix E Adjustment Factors

Appendix F Site Generated Traffic Volumes / Trip Distribution

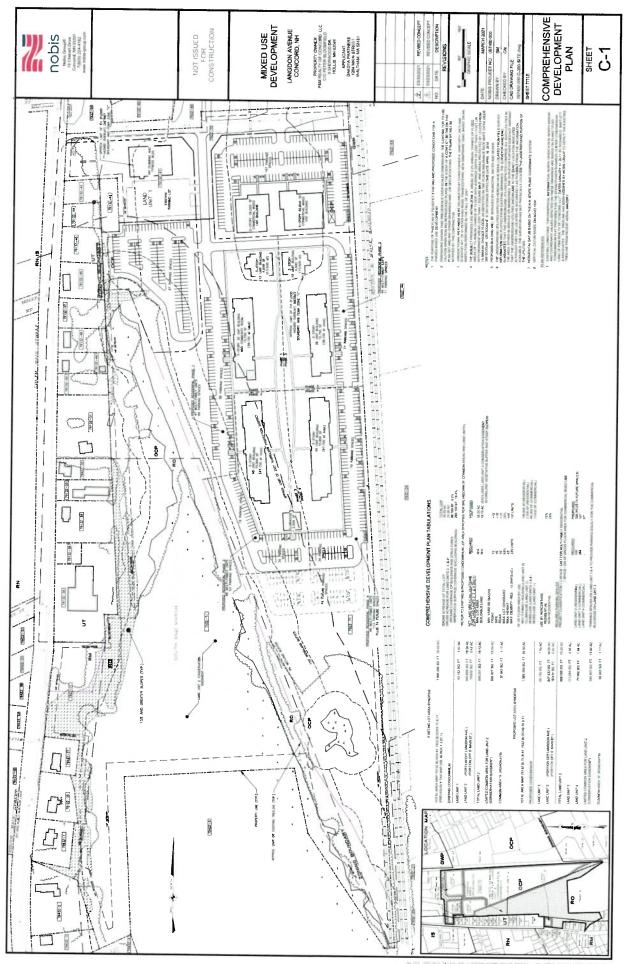
Appendix G Capacity and Level of Service Calculations – Unsignalized

Appendix H Auxiliary Turn Lane Analysis
Appendix I Sight Distance Photographs

Appendix A

Comprehensive Development Plan

Z089A



Appendix B

Automatic Traffic Recorder Counts





Transportation Data Management System



Excel Version

Weekly Volume Rep	oort		为于是我们的 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
Location ID:	82099073	Type:	SPOT
Located On:	S Main St		
Direction:	2-WAY		
Community:	CONCORD	Period:	Mon 6/18/2018 - Sun 6/24/2018
AADT:	7267		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph	
12:00 AM		24	35					30		0.4%
1:00 AM		15	22					19	-	0.2%
2:00 AM		8	13					1		0.1%
3:00 AM		22	19					2	-	0.2%
4:00 AM		57	29					43		0.5%
5:00 AM		170	138					154	-	1.8%
6:00 AM		259	247					253		3.0%
7:00 AM		669	633					651		7.8%
8:00 AM		592	580					586		7.0%
9:00 AM		454	449					452	and the second second second	5.4%
10:00 AM		477	434					456		5.4%
11:00 AM		549	512					531		6.3%
12:00 PM		561	590					576		6.9%
1:00 PM		566	559					563		6.7%
2:00 PM		525	505					515		6.2%
3:00 PM		654	659					657		7.9%
4:00 PM	-	854	793)				824		9.8%
5:00 PM		718	744	_				731		8.7%
6:00 PM		475	421					448		5.4%
7:00 PM		306	243					275		3.3%
8:00 PM	-n15	246	289					268		3.2%
9:00 PM		165	160					163		1.9%
10:00 PM		96	92					94		1.1%
11:00 PM		48	46					47		0.6%
Total	0	8,510	8,212	0	0	0	0			0.070
24hr Total		8510	8212					8,361		
AM Pk Hr		7:00	7:00							
AM Peak		669	633					651		
PM Pk Hr		4:00	4:00							
PM Peak		854	793					824		
% Pk Hr		10.04%	9.66%					9.85%		

Appendix C

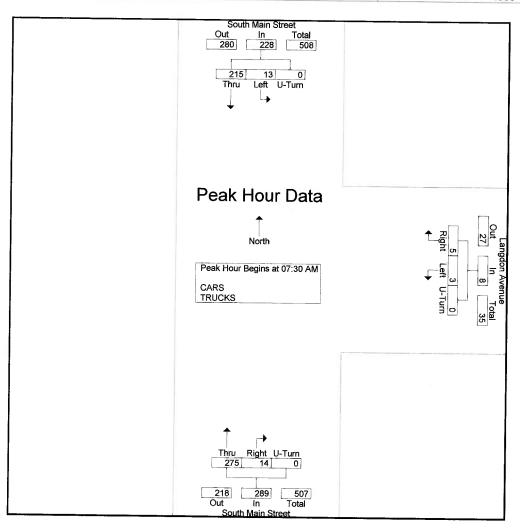
Intersection Turning Movement Counts

Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A_AM_&_PM_Wed Site Code : 2089A

Start Date : 4/14/2021 Page No : 2

Ota 4 T		From	lain Stree North			Langdon Avenue South Main Street From East From South						t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis I	From 07:00	O AM to (08:45 AM	- Peak 1 of 1				- pp - count	· ugiit	iniu	O Tarri	App. Total	III. TOtal
Peak Hour for Entire	Intersection	n Begins	s at 07:30	AM									
07:30 AM	54	4	0	58	0	٥	0	n l	2	67	•	00	407
07:45 AM	61	7	Ō	68	ž	1	Ô	0	2		Ü	69	127
08:00 AM	46	1	Õ				_	3	3	97	0	100	171
			U	47	7	U	0	1	6	61	0	67	115
08:15 AM	54	1	0	55	2	2	0	4	3	50	n	53	112
Total Volume	215	13	0	228	5	3	0	8	14	275	0		
% App. Total	94.3	5.7	0		62.5	37.5	0	0			U	289	525
PHF	.881	.464	.000	.838	.625	.375	.000	500	4.8	95.2	U		
			.000	.000	.020	.3/0	.000	.500	.583	.709	.000	.723	.768



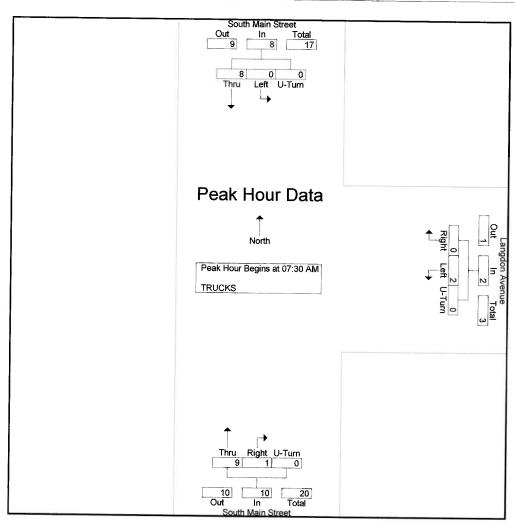
Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name: 2089A_INT_A__AM_&_PM_Wed

Site Code : 2089A Start Date : 4/14/2021

Page No : 2

0.		From	ain Street North			_	n Avenue n East	!			lain Stree	t	
Start Time	Thru	Left	U-Turn A	pp. Total	Right	Left	U-Turn	App. Tota	I Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis I	rom 07:30	AM to 0	8:15 AM - F	Peak 1 of 1	<u> </u>			·	i ingiic	Tilla	O-Tuill	App. Total	IIII. TOIAI
Peak Hour for Entire	Intersection	n Begins	at 07:30 Al	M									
07:30 AM	3	ŏ	0	3	0	0	0		1 4	2	^	0	•
07:45 AM	1	0	ñ	1	ñ	4	0		'		0	3	6
08:00 AM	3	ñ	ň	3	0	,	0	1	0	5	Ū	5	7
08:15 AM	1	0	0	3	0	U	Ū	· ·	0	0	0	0	3
		<u> </u>			U	1	0		0	2	0	2	4
Total Volume	8	0	0	8	0	2	0	2	1	9	0	10	20
% App. Total	100	0	0		0	100	0	_	10	90	n	10	20
PHF	.667	.000	.000	.667	.000	.500	.000	.500		.450	.000	.500	.714



Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

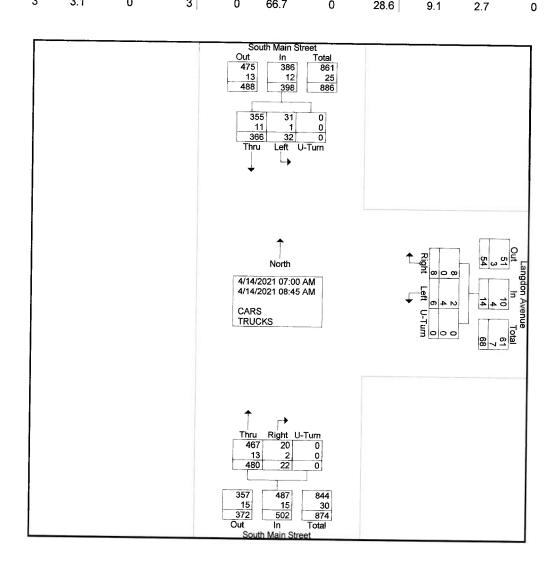
File Name: 2089A_INT_A__AM_&_PM_Wed

Site Code : 2089A Start Date : 4/14/2021

Page No : 1

_	Groups	Printed-	CARS -	TRUCKS

		Caudle BA	Latin Otto		C.oupo i i								
			lain Stree	t		-	n Avenue			South N	lain Stree	t	
Ot - 1 T			North			Fron	n East			From	South		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	34	3	0	37	0	0	0	0	0	33	0 10111	33	70
07:15 AM	45	0	0	45	0	0	Ó	ñ	1	55	ñ	56	
07:30 AM	54	4	0	58	0	Ō	Õ	ŏ	2	67	0	69	101
07:45 AM	61	7	0	68	2	1	ñ	3	2	97	0		127
Total	194	14	0	208	2	<u> </u>	0	3	6	252		100	171
					_	•	U	3	0	252	0	258	469
08:00 AM	46	1	0	47	1	0	0	4	6	C4	•		2
08:15 AM	54	1	Ō	55	2	2	0	1	6	61	Ü	67	115
08:30 AM	41	6	ñ	47	2	2		4	3	50	Ü	53	112
08:45 AM	31	10	n	41	1	4	0	4	3	63	0	66	117
Total	172	18	0	190	6		0	2	4	54	0	58	101
· otal	.,,_		U	190	6	5	0	11	16	228	0	244	445
Grand Total	366	32	0	398	8	6	^	441	00	400	_	1	
Apprch %	92	8	n	330	57.1	42.9	0	14	22	480	0	502	914
Total %	40	3.5	0	43.5			0		4.4	95.6	0		
CARS	355	31	0		0.9	0.7	0	1.5	2.4	52.5	0	54.9	
% CARS	97	96.9	•	386	8	2	0	10	20	467	0	487	883
TRUCKS	11	90.9	0	97	100	33.3	0_	71.4	90.9	97.3	0	97	96.6
% TRUCKS		2.4	0	12	0	4	0	4	2	13	0	15	31
1 INUCKS	3	3.1	0	3	0	66.7	0	28.6	9.1	2.7	0	3	3.4



Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

Total

Grand Total

Apprch %

Total %

5

11

91.7

1

1

8.3

0

0

0

6

12

0

0

0

File Name : 2089A_INT_A__AM_&_PM_Wed Site Code : 2089A

0

0

0

14

31

5

15

48.4

Start Date : 4/14/2021

Page No : 1

3

4

2

13.3

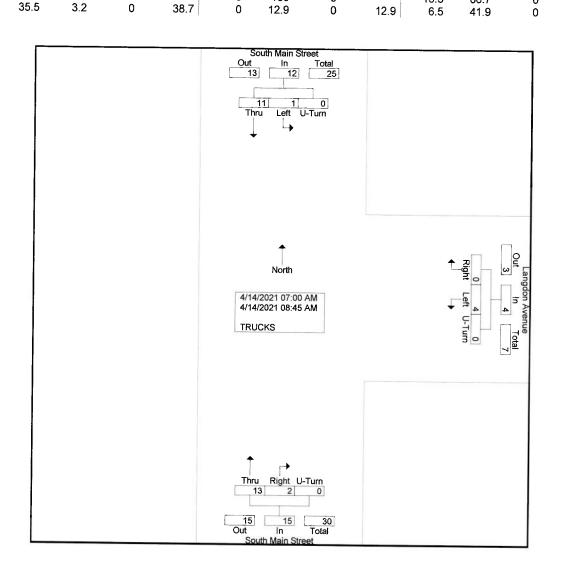
13

86.7

0

South Main Street From North From East From East From South Main Street From South			South M	lain Ctran		Олопро		- TRUCK						
O7:00 AM 0 1 0 1 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 0 1 0<			From	North										
07:00 AM	Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App Total	Right			Ann Total	Int. Total
07:30 AM 3 0 0 3 0 0 0 0 1 2 0 3 0 0 0 0 1 2 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	07:00 AM	0	0	0	0	0	0	0	7 ipp: 10tai	rtigitt	11114	0-14111	App. Total	III. Total
07:30 AM 3 0 0 3 0 0 0 0 1 2 0 3 0 0 0 0 1 2 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	07:15 AM	2	ñ	ň	2	ŏ	0	0	0	0		Ū	1	1
07:45 AM 1 0 0 1 0 1 0 1 0 5 0 5 Total 6 0 0 6 0 1 0 1 0 5 0 5 08:00 AM 3 0		2	Õ	ŏ	2	0	0	Ū	U	Ü	1	0	1	3
Total 6 0 0 6 0 1 0 1 0 5 0 5 0 5 0 5 0 0 0 0 0 0 0 0		3	0	0	3	Ū	U	O	0	1	2	0	3	6
08:00 AM 3 0 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			U	U	1	0	1	0	1	0	5	0	5	7
08:15 AM 1 0 0 1 0 1 0 2 0 2 0 2 0 08:30 AM 1 0 0 1 0 1 0 1 1 2 0 3	lotal	6	0	0	6	0	1	0	1	1	9	0	10	17
08:15 AM	08:00 AM	3	0	0	3	0	0	0	0.1	0	0	0	0.1	•
	08:15 AM	1	0	0	1	Õ	1	Õ	1	0	0	0	U	3
	08:30 AM	1	ñ	Õ	1	0	4	0	1	Ü		U	2	4
	08:45 AM	'n	4	0		0	!	U	1	1	2	0	3	5
Total 5 1 0 6 0 3 0 2 4 4 6		<u> </u>			1	0	1	0	1	0	0	0	0	2

100



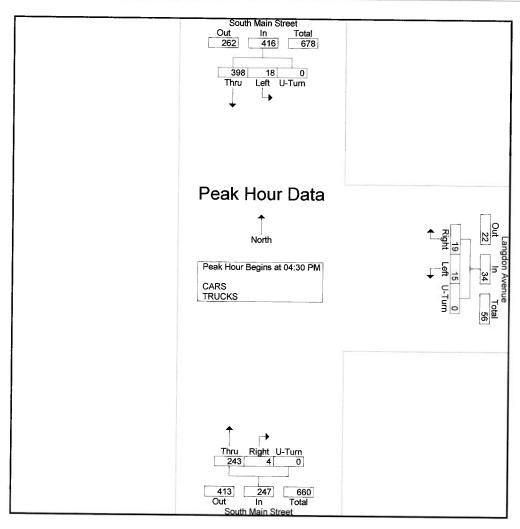
Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name: 2089A_INT_A_AM_&_PM_Wed

Site Code : 2089A Start Date : 4/14/2021

Page No : 3

		From	lain Stree n North	t			n Avenue n East	•			lain Stree	t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Tota
Peak Hour Analysis F	rom 03:0	0 PM to 0	05:45 PM	- Peak 1 of 1				, pp	rugin	111110	O Tuill	App. Total	III. Tota
Peak Hour for Entire	Intersection	n Beains	s at 04:30	PM									
04:30 PM	102	5	0	107	5	5	Λ	10	1	66	^	67	404
04:45 PM	87	6	Ō	93	2	9	ň	11	1		U	67	184
05:00 PM	119	1	ñ	123	-	3	0	'-	'	56	U	57	161
05:15 PM		7	0		0	ı	U	1	U	55	0	55	185
	90	3	0	93	6	0	0	6	2	66	0	68	167
Total Volume	398	18	0	416	19	15	0	34	4	243	ñ	247	697
% App. Total	95.7	4.3	0		55.9	44.1	Ö		1.6	98.4	0	247	097
PHF	.836	.750	.000	.846	.792	.417	.000	.773	.500	.920	.000	.908	.942

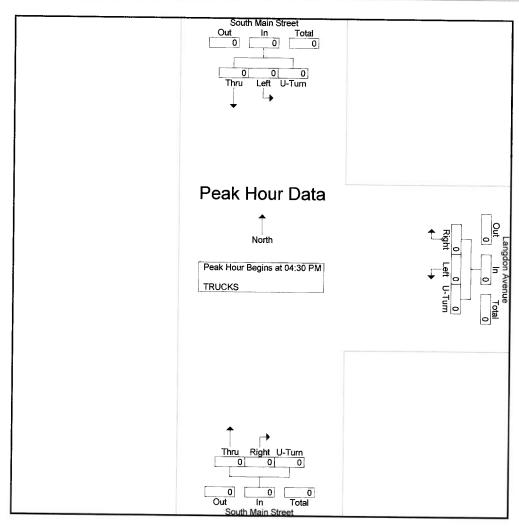


Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A__AM_&_PM_Wed Site Code : 2089A

Start Date : 4/14/2021 Page No : 2

			ain Stree North	t		-	n Avenue n East		South Main Street From South				
Start Time	Thru	Left	U-Turn		Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis i	From 04:3	0 PM to 0	5:15 PM	- Peak 1 of 1				ripp. rotar	ragin	iniu	O-Tuill	App. Total	IIII. TOTAL
Peak Hour for Entire	Intersection	on Begins	at 04:30	PM									
04:30 PM	0	0	0	0.1	n	٥	n	0	0	0	^	0	
04:45 PM	Ó	Õ	Õ	ő	n	Ô	0	0	0	0	Ü	0	0
05:00 PM	Ō	Õ	Õ	ő	n	0	0	0	0	U	Ü	0	0
05:15 PM	0	Ō	Õ	ñ	Õ	Ô	0	0	0	0	U	0	0
Total Volume	0	0	0	0	0	0				0		0	0
% App. Total	ñ	ñ	Õ	0	0	0	0	U	Ü	Ū	0	0	0
PHF	.000	.000	000	000	000	000	0		0	0	0		
FIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A__AM_&_PM_Wed Site Code : 2089A

Start Date : 4/14/2021
Page No : 1

Groups Printed- CARS - TRUCKS

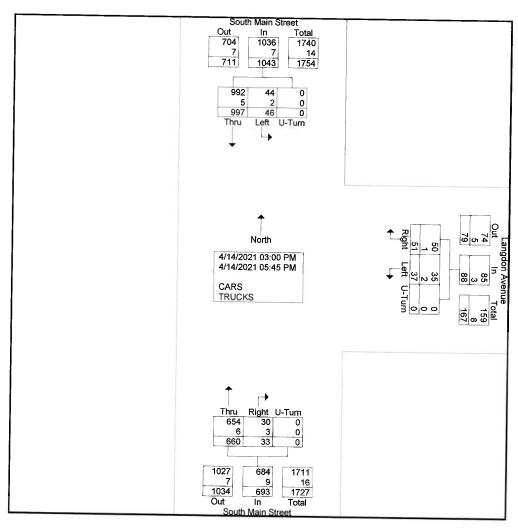
					Groups Pr								
		From	ain Stree North	t			n Avenue n East	•	South Main Street From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	75	4	0	79	1	3	0	4	4	46	0	50	133
03:15 PM	70	1	0	71	5	1	0	6	5	51	n	56	133
03:30 PM	71	3	0	74	5	1	0	6	3	49	ñ	52	132
03:45 PM	61	6	0	67	2	5	0	7	5	68	_ 0	73	147
Total	277	14	0	291	13	10	0	23	17	214	Ö	231	545
04:00 PM	108	5	0	113	7	5	0	12	5	54	0	59	184
04:15 PM	79	4	0	83	5	6	Ō	11	3	55	0	58	152
04:30 PM	102	5	0	107	5	5	Ō	10	1	66	0	67	184
04:45 PM	87	6	0	93	2	9	0	11	1	56	Ő	57	161
Total	376	20	0	396	19	25	0	44	10	231	0	241	681
05:00 PM	119	4	0	123	6	1	0	7	0	55	0	55	185
05:15 PM	90	3	0	93	6	0	Ō	6	2	66	0	68	167
05:30 PM	72	0	0	72	2	1	Ō	3	1	55	0	56	131
05:45 PM	63	5	0	68	5	0	ō	5	3	39	ő	42	115
Total	344	12	0	356	19	2	0	21	6	215	Ö	221	598
Grand Total	997	46	0	1043	51	37	0	88	33	660	0	693	1824
Apprch %	95.6	4.4	0		58	42	ō		4.8	95.2	ő	093	1024
Total %	54.7	2.5	0	57.2	2.8	2	ŏ	4.8	1.8	36.2	0	38	
CARS	992	44	0	1036	50	35	0	85	30	654	0	684	1805
% CARS	99.5	95.7	0	99.3	98	94.6	Ŏ	96.6	90.9	99.1	0	98.7	99
TRUCKS	5	2	0	7	1	2	Ö	3	3	6	0	90.7	19
% TRUCKS	0.5	4.3	0	0.7	2	5.4	ō	3.4	9.1	0.9	ő	1.3	19

Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A__AM_&_PM_Wed Site Code : 2089A

Site Code : 2089A Start Date : 4/14/2021

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Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

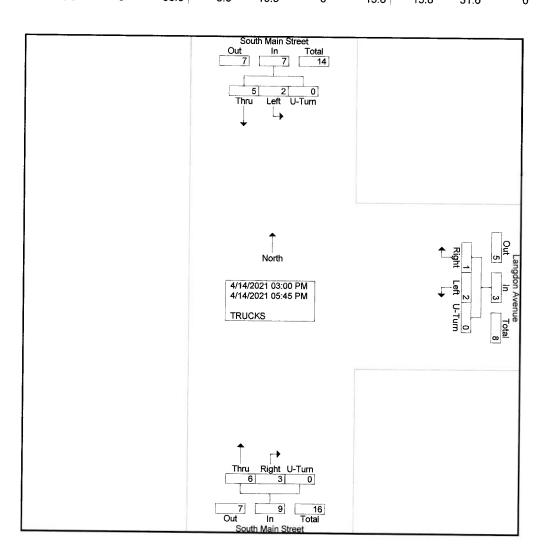
File Name : 2089A_INT_A__AM_&_PM_Wed Site Code : 2089A

Site Code : 2089A Start Date : 4/14/2021

Page No : 1

Groups Printed-TRUCKS

			lain Stree North		<u> </u>	Langdo	n Avenue n East		South Main Street From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru		App. Total	Int. Total
03:00 PM	0	1	0	1	0	1	0	1	0	0	O TUIN	ripp. Total	iii. Total
03:15 PM	1	0	0	1	0	0	Õ	ń	ŏ	ñ	0	0	4
03:30 PM	0	0	0	Ó	1	Õ	ñ	1	3	2	0	5	ļ
03:45 PM	0	0	0	Ö	Ó	1	Ŏ	1	Õ	0	0	5	1
Total	1	1	0	2	1	2	0	3	3	2	0	5	10
04:00 PM	2	0	0	2	0	0	0	0	0	1	0	1	2
04:15 PM	1	1	0	2	Ō	Õ	Õ	Õ	Õ	2	0	2	3
04:30 PM	0	0	0	0	Ō	Õ	ñ	n	Õ	<u>ر</u> م	0	2	4
04:45 PM	0	0	0	0	0	Ō	ŏ	0	ŏ	ň	0	0	0
Total	3	1	0	4	0	0	0	0	0	3	0	3	7
05:00 PM	0	0	0	0	0	0	0	0	0	n	0	0	0
05:15 PM	0	0	0	0	Ō	Ō	ñ	ŏ	ň	ň	0	0	0
05:30 PM	1	0	0	1	Õ	Õ	ň	ŏ	ñ	0	0	0	1
05:45 PM	0	0	0	0	Ō	Ö	ŏ	ŏ	ŏ	1	0	1	1
Total	1	0	0	1	0	Ö	ō	0	0	1	0	1	2
Grand Total	5	2	0	7	1	2	0	3	3	6	0	9	19
Apprch %	71.4	28.6	0		33.3	66.7	Ŏ		33.3	66.7	0	9	19
Total %	26.3	10.5	0	36.8	5.3	10.5	Ő	15.8	15.8	31.6	ő	47.4	

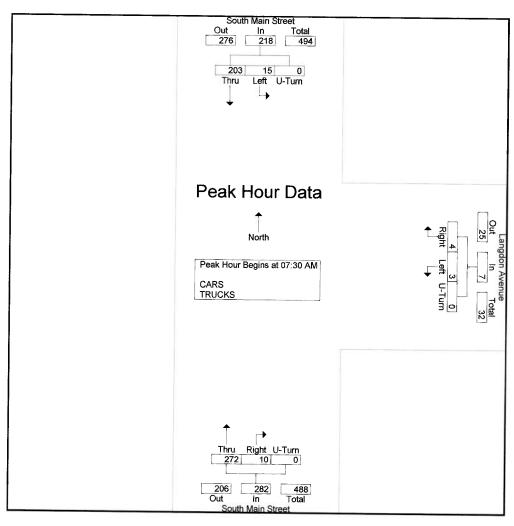


Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name: 2089A_INT_A_AM_&_PM_Thurs

Site Code : 2089A Start Date : 4/15/2021 Page No : 2

			ain Stree North	t			n Avenue n East				lain Stree	t	
Start Time	Thru	Left	U-Turn		Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Tota
eak Hour Analysis f	rom 07:00	AM to 0	08:45 AM	- Peak 1 of 1				, ipp, . ota.	rugine	Tinu	O Tuill	App. Total	IIII. TOla
eak Hour for Entire	Intersection	n Beains	at 07:30	AM									
07:30 AM	52	3	0	55	1	٥	Λ	1	1	55	0	EC	446
07:45 AM	64	5	0	69	'n	ñ	ñ	ó			0	56	112
08:00 AM	47	5	ñ	52	1	2	0	4	5	104	U	109	178
08:15 AM	40	2	ŏ	V-00-1-1-1		S .	U	4	4	57	0	61	117
			U	42	2	U	0	2	0	56	0	56	100
Total Volume	203	15	0	218	4	3	0	7	10	272	0	282	507
% App. Total	93.1	6.9	0		57.1	42.9	0		3.5	96.5	Ô	202	307
PHF	.793	.750	.000	.790	.500	.250	.000	.438	.500	.654	.000	.647	.712



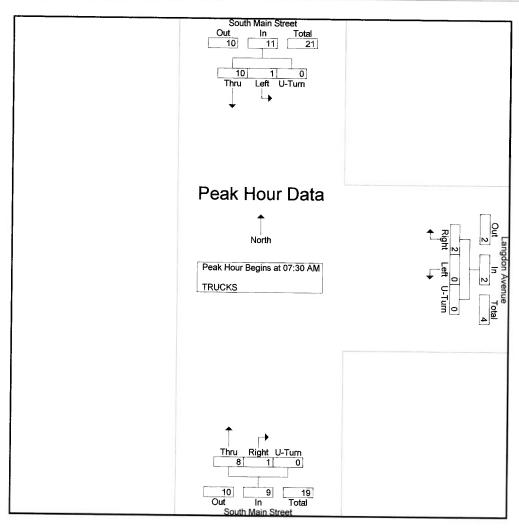
Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A_AM_&_PM_Thurs Site Code : 2089A

Start Date : 4/15/2021

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		From					n Avenue n East				lain Street South		
Start Time	Thru		U-Turn .	App. Total	Right	Left	U-Turn	App. Total	Right	Thru		App. Total	Int. Total
eak Hour Analysis	From 07:30	AM to 0	8:15 AM -	Peak 1 of 1				ipp otal [rugine	11110	O-Tuili /	tpp. Total	int. Total
eak Hour for Entire	Intersection	n Begins	at 07:30 A	AM									
07:30 AM	3	Ŏ	0	3	Ω	0	0	0.1	^	•	0	• 1	
07:45 AM	2	1	ñ	3	ñ	ň	0	0	4	3	U	3	6
08:00 AM	4	'n	Õ	4	4	0	0	U	1	2	Ō	3	6
08:15 AM	7	0	0	4	1	U	U	1	0	2	0	2	7
		U	0	1	1	0	0	1	0	1	0	1	3
Total Volume	10	1	0	11	2	0	0	2	1	8			22
% App. Total	90.9	9.1	0		100	ñ	0	-	11.1	88.9	0	9	22
PHF	.625	.250	.000	.688	.500	.000	.000	.500	.250	.667	.000	.750	.786



Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

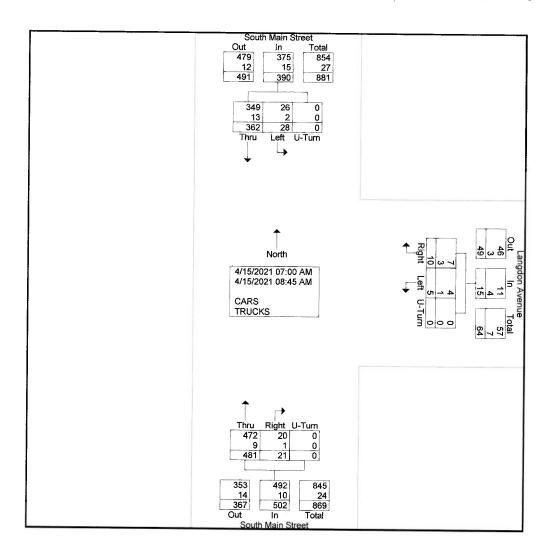
File Name : 2089A_INT_A__AM_&_PM_Thurs Site Code : 2089A

Site Code : 2089A Start Date : 4/15/2021

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Groups Printed- CARS - TRUCKS

					Groups Pr	miea- CA	180 - IRU	JUKS					
		From	lain Stree North				n Avenue n East				Main Stree า South	t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	36	1	0	37	0	0	0	0	0	40	0	40	77
07:15 AM	43	0	0	43	0	0	0	0	Ô	56	n	56	99
07:30 AM	52	3	0	55	1	0	Ō	1	1	55	ñ	56	112
07:45 AM	64	5	0	69	0	0	Ŏ	Ö	5	104	0	109	178
Total	195	9	0	204	1	0	0	1	6	255	0	261	466
MA 00:80	47	5	0	52	1	3	0	4	4	57	0	61	117
08:15 AM	40	2	0	42	2	0	0	2	ó	56	ñ	56	100
08:30 AM	47	6	0	53	2	1	Ō	3	5	47	ñ	52	108
08:45 AM	33	6	0	39	4	1	ō	5	6	66	0	72	116
Total	167	19	0	186	9	5	0	14	15	226	Ö	241	441
Grand Total	362	28	0	390	10	5	0	15	21	481	0	502	907
Apprch %	92.8	7.2	0		66.7	33.3	0		4.2	95.8	ñ	302	001
Total %	39.9	3.1	0	43	1.1	0.6	0	1.7	2.3	53	ő	55.3	
CARS	349	26	0	375	7	4	0	11	20	472	0	492	878
% CARS	96.4	92.9	0	96.2	70	80	ō	73.3	95.2	98.1	Ô	98	96.8
TRUCKS	13	2	0	15	3	1	0	4	1	9	0	10	29
% TRUCKS	3.6	7.1	0	3.8	30	20	Ö	26.7	4.8	1.9	0	2	3.2



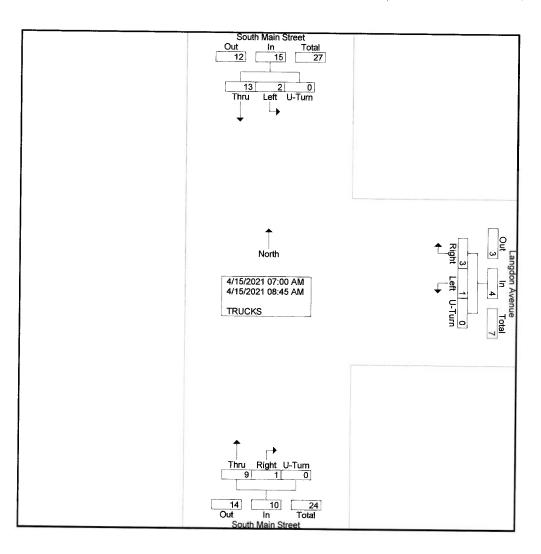
Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name: 2089A_INT_A__AM_&_PM_Thurs

Site Code : 2089A Start Date : 4/15/2021 Page No : 1

Groups Printed-TRUCKS

		From	lain Stree North				n Avenue n East				lain Stree South	t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	ripp. Total	nit. Total
07:15 AM	1	0	0	1	Ō	0	ñ	Õ	0	0	0	0	U
07:30 AM	3	0	0	3	ñ	Õ	ő	0	0	9	0	0	1
07:45 AM	2	1	0	3	ñ	n	ő	0	0	ა ე	Ū	3	6
Total	6	1	0	7	ő	0	0	0	1	5	0	6	6 13
08:00 AM	4	0	0	4	1	0	0	1	0	2	0	2	7
08:15 AM	1	0	0	1	1	0	Ō	1	ň	1	ñ	1	,
08:30 AM	0	1	0	1	0	1	ñ	i	ň	'n	0		3
08:45 AM	2	0	0	2	1	Ó	ň	i	0	1	0	1	4
Total	7	1	0	8	3	1	0	4	0	4	0	4	16
Grand Total	13	2	0	15	3	1	0	4	1	9	n	10	29
Apprch %	86.7	13.3	0	Í	75	25	Ō	·	10	90	ñ	10	25
Total %	44.8	6.9	0	51.7	10.3	3.4	Ö	13.8	3.4	31	0	34.5	



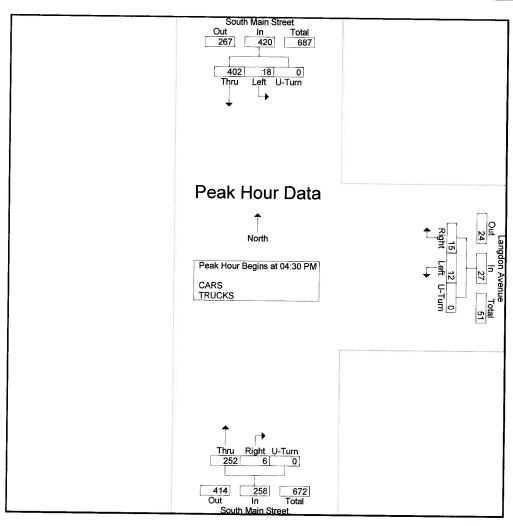
Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A__AM_&_PM_Thurs Site Code : 2089A

Start Date : 4/15/2021

Page No : 3

		From				-	n Avenue n East				ain Street South		
Start Time	Thru		U-Turn A	pp. Total	Right	Left	U-Turn A	pp. Total	Right	Thru		App. Total	Int. Total
Peak Hour Analysis	From 03:00	PM to 0	5:45 PM - F	eak 1 of 1				pp otal	rugin	11114	O-Tuill	App. Total	III. Total
Peak Hour for Entire	Intersection	n Begins	at 04:30 PI	VI									
04:30 PM	106	7	0	113	2	5	0	7	2	54	0	F7 !	477
04:45 PM	86	3	0	89	3	Ž	0	7	3	74	0	57	177
05:00 PM	118	6	Ŏ	124	6	7	0		1	71	Ū	72	168
05:15 PM	92	2	ŏ		•		Ū	8	U	55	0	55	187
				94	4	1	0	5	2	72	0	74	173
Total Volume	402	18	0	420	15	12	0	27	6	252	0	258	705
% App. Total	95.7	4.3	0		55.6	44.4	Ō		2.3	97.7	ñ	250	705
PHF	.852	.643	.000	.847	.625	.600	.000	.844	.500	.875	.000	.872	.943

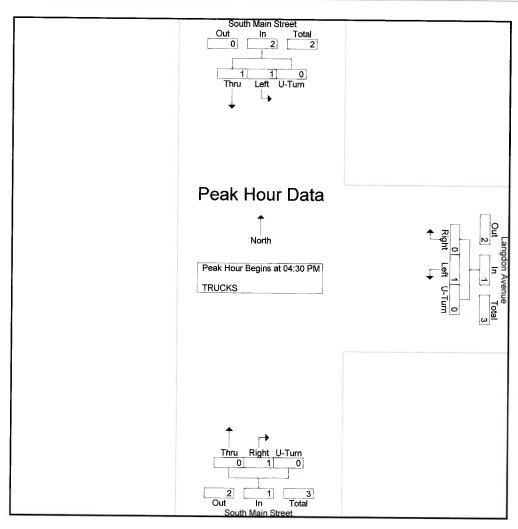


Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A__AM_&_PM_Thurs

Site Code : 2089A Start Date : 4/15/2021 Page No : 2

		(500)	ain Stree North	t			n Avenue n East				fain Stree	t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Tota	Right	Thru	U-Turn	App. Total	Int. Tota
Peak Hour Analysis F	rom 04:30	PM to (5:15 PM	- Peak 1 of 1				1 1 1 1 1 1 1 1	19	11114	o ram	ripp. Total	IIIC. TOta
Peak Hour for Entire	Intersectio	n Begins	at 04:30	PM									
04:30 PM	0	1	0	1	٥	1	n	1	1	0	0	4	
04:45 PM	0	0	Ō	Ö	Õ	ò	ñ	·		0	0	'n	3
05:00 PM	1	0	Ó	1	Õ	ň	ñ	č	0	0	0	0	
05:15 PM	0	0	Ō	Ó	Ô	ñ	ñ	0	0	0	0	0	,
Total Volume	1	1	0	2	0	1	0	1	1			1	
% App. Total	50	50	Ō	-	Ô	100	ñ	'	100	0	0	Į.	4
PHF	.250	.250	.000	.500	.000	.250	.000	.250	.250	.000	.000	.250	.333



Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A_AM_&_PM_Thurs Site Code : 2089A

Start Date : 4/15/2021 Page No : 1

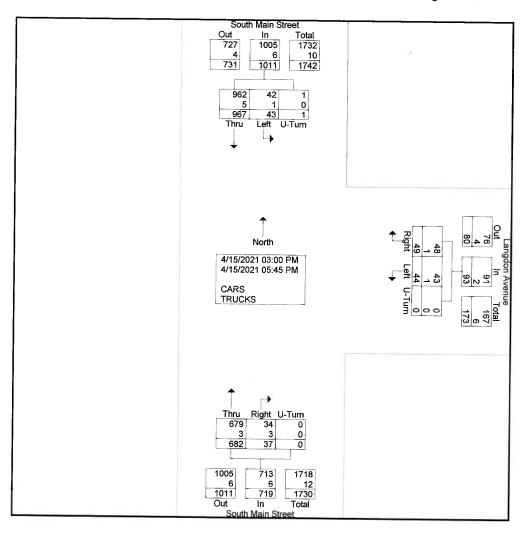
Groups Printed- CARS - TRUCKS

		From	lain Stree North	t	Groups Pr	Langdo	n Avenue n East				lain Stree South	t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	57	5	0	62	5	4	0	9	3	37	0	40	111
03:15 PM	68	4	0	72	5	2	0	7	3	64	ñ	67	146
03:30 PM	72	4	0	76	5	4	0	9	6	68	Õ	74	159
03:45 PM	50	2	0	52	5	5	0	10	6	57	ñ	63	125
Total	247	15	0	262	20	15	0	35	18	226	0	244	541
04:00 PM	95	2	0	97	4	7	0	11	5	61	0	66	174
04:15 PM	84	6	1	91	2	7	ō	9	4	40	n	44	144
04:30 PM	106	7	0	113	2	5	ō	7	3	54	Ô	57	177
04:45 PM	86	3	0	89	3	4	Ö	7	1	71	0	72	168
Total	371	18	1	390	11	23	0	34	13	226	ő	239	663
05:00 PM	118	6	0	124	6	2	0	8	0	55	0	55	187
05:15 PM	92	2	0	94	4	1	Ō	5	2	72	n	74	173
05:30 PM	71	1	0	72	4	3	0	7	2	56	n	58	137
05:45 PM	68	1	0	69	4	0	Ō	4	2	47	ő	49	122
Total	349	10	0	359	18	6	0	24	6	230	0	236	619
Grand Total	967	43	1	1011	49	44	0	93	37	682	0	719	1823
Apprch %	95.6	4.3	0.1		52.7	47.3	Ö		5.1	94.9	n	713	1023
Total %	53	2.4	0.1	55.5	2.7	2.4	0	5.1	2	37.4	ő	39.4	
CARS	962	42	1	1005	48	43	0	91	34	679	0	713	1809
% CARS	99.5	97.7	100	99.4	98	97.7	0	97.8	91.9	99.6	0	99.2	99.2
TRUCKS	5	1	0	6	1	1	0	2	3	3	0	6	14
% TRUCKS	0.5	2.3	0	0.6	2	2.3	Ŏ	2.2	8.1	0.4	0	0.8	0.8

Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name: 2089A_INT_A__AM_&_PM_Thurs

Site Code : 2089A Start Date : 4/15/2021 Page No : 2



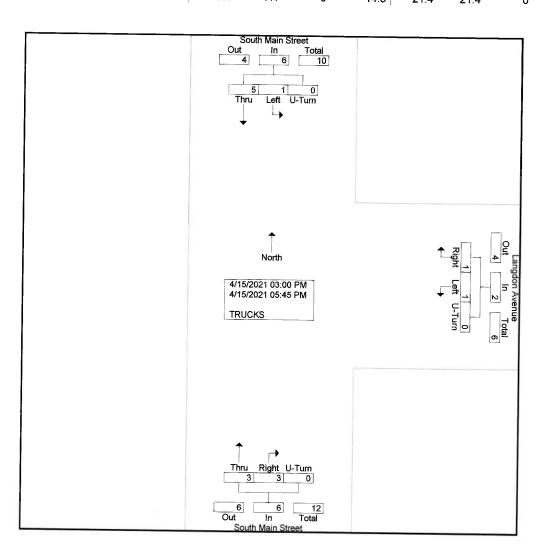
Weather: Clear Collected By: MV Job Number: 2089A Town/State: Concord, NH

File Name : 2089A_INT_A_AM_&_PM_Thurs Site Code : 2089A

Start Date : 4/15/2021 Page No : 1

Groups	Printed-	TRUCKS	

			ain Stree North	t		Langdo	n Avenue n East				Main Stree	t	
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Tota	l Right	Thru	U-Turn	App. Total	Int Tatal
03:00 PM	0	0	0	0	0	0	0	ripp. rota) (digit	111114	0-14111	App. Total	Int. Total
03:15 PM	0	0	0	0	Õ	ñ	ñ	č		1	0	U	0
03:30 PM	1	0	0	1	1	ñ	ñ	1	, ,	1	Ü	1	1_
03:45 PM	0	0	0	0	'n	ñ	ň	Ċ	2	1	Ü	3	5
Total	1	0	0	1	1	Ö	0	1	2	2	0	4	6
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	n i	0
04:15 PM	1	0	0	1	0	0	0	Ô	ı ö	ñ	n	0	1
04:30 PM	0	1	0	1	0	1	Ō	1	1	ň	0	1	1
04:45 PM	0	0	0	0	0	0	Ö	'n	0	ő	0	,	3
Total	1	1	0	2	0	1	Ö	1	1	0	0	1	4
05:00 PM	1	0	0	1	0	0	0	0	_ n	0	0	0.1	4
05:15 PM	0	0	0	0	0	Ō	ñ	n	ŏ	0	0	0	1
05:30 PM	1	0	0	1	Ō	ō	Õ	n	0	1	0	0	0
05:45 PM	1	0	0	1	Õ	ñ	Ö	o O	ő		0		2
Total	3	0	0	3	0	0	Ö	0		1	0	1	4
Grand Total	5	1	0	6	1	1	0	2	3	3	0	6	4.4
Apprch %	83.3	16.7	0		50	50	ŏ	_	50	50	0	0	14
Total %	35.7	7.1	0	42.9	7.1	7.1	ő	14.3		21.4	0	42.9	



Appendix D

Crash Data



Concord Police Department From: 01/01/2018 Thru: 04/12/2021

Page: 1

Jurisdictions: ALL

Location: ALL

Street: CON > S MAIN ST
Intersecting Street: CON > LANGDON ST
Zones: ALL

Accident Statistics By Time of Day

		SUN	MON	TUE	WED	THR	<u>FRI</u>	SAT	TOTALS
1	AM		0 (0	0	0	0	0	0
2	AM		0 (0	Õ	0	0	0	0
3	AM		0 (0 0	0	Ö	0	Ö	0
4	AM		0 (0	0	Ö	Ő	ő	0
5	AM		0 (0	0	0	Õ	0	0
6	AM		0 (0	Ō	Õ	Ő	0	0
7	AM		0 (0	0	0	0	Ö	0
8	AM		0 (0	0	0	Ō	0	0
9	AM	1	0 1	L 0	0	0	0	0	1
10	AM	1	0 (0	0	0	0	Ô	Ō
11	AM	1	0 (0	0	0	0	0	0
12	PM	+	0 (0	0	1	0	0	1
1	PM	(0 (0	0	0	0	0	0
2	PM	(0 (0	0	0	0	0	0
3	PM	1	0 () 0	0	0	0	0	0
4	PM	(0 0	0	0	0	0	0	Ö
5	PM	(0 0	0	0	0	0	0	0
6	PM	() C) 0	0	0	0	0	0
7	PM	() (0	0	0	0	0	0
8	PM	() (0	0	0	0	0	0
9	PM	() (0	0	0	0	0	Ō
10	PM	() (0	0	0	0	0	0
11	PM	() (0	0	0	0	0	0
12	AM	(0	0	0	0	0	0	0
TO	OTALS		<u> </u>	0	0	1			 2

Accident Particulars

	Occurrence(s)	Percentage
Average posted speed at the accident scene		30 MPH
Occurred at On-ramps	0	0.0
Occurred at Off-ramps	0	0.0
Occurred at an intersection	1	50.0
Occurred at a rotary	0	0.0
Occurred on a one lane road/highway	0	0.0
Occurred on a two lane road/highway	0	0.0
Occurred on a three lane road/highway	0	0.0
Occurred on a four lane road/highway	0	0.0
Occurred on other number of lanes	2	100.0
Involved OUI violation(s)	ñ	0.0
Photos were taken	0	0.0

Concord Police Department From: 01/01/2018 Thru: 04/12/2021

Page: 2

Measurements were t Investigation took Involved Injuries Involved Fatalities	place			0 0.0 1 50.0 0 0.0 0 0.0								
	A	ge and Se	x Breakd	own of Or	erators							
	<u> </u>	19-21	22-25	<u>26-35</u>	<u>36-45</u>	46-60	<u>> 60</u>	TOTALS				
Male	0	0	1	0	1	0	0	2				
Female	0	0	0	0	0	1	1	2				
Non-Binary	0	0	0	0	0	0	0	0				
Unknown	0	0	0	0	0	0	0	0				
TOTALS	0	0	1	0	1	1	1	4				
				Occu:	rrence(s)		P	ercentage				
Number of out of st Number of operators	ate operat who were	ors cited			0			0.0				
		Road Sur	face (pri	or to 4.	6.19)							
			-	Occus	rrence(s)		P	ercentage				
DRY					2		•	100.0				
Total Occurrences					2			100.0 %				
	Veh. Acti	lon Prior	To Acci	dent (pri	or to 4.	6.19)						
				Occur	rence(s)		Pe	ercentage				
FOLLOWING ROADWAY MAKING LEFT TURN STOPPED IN TRAFFIC					2 1 1			50.0 25.0 25.0				
Total Occurrences					4			100.0 %				
	Apparent	Contribu	ting Fact	ors (pri	or to 4.6	5.19)						
				Occur	rence(s)		P€	ercentage				

Concord Police Department From: 01/01/2018 Thru: 04/12/2021

Page: 3

DDIVED INTERPRETARION (DIGED SETON		
DRIVER INATTENTION/DISTRACTION NO IMPROPER DRIVING FOLLOWING TOO CLOSE	1 2	25.0 50.0
LONDOWING TOO CHOSE	1	25.0
Total Occurrences	4	100.0 %
Vehicle	Defects (prior to 4.6.19)	
	Occurrence(s)	Percentage
NO APPARENT DEFECTS	4	100.0
Total Occurrences	4	100.0 %
Hazardous Ma	aterial Code (prior to 4.6.19)	
	Occurrence(s)	Percentage
N - Not On File	4	100.0
Total Occurrences	4	100.0 %
Point Of	Impact (prior to 4.6.19)	
·	Occurrence(s)	Percentage
CENTER FRONT CENTER REAR	2	50.0
CHIEN REAR	2	50.0
Total Occurrences	4	100.0 %
Ejectio	on Code (prior to 4.6.19)	
	Occurrence(s)	Percentage
NOT EJECTED	5	100.0
Total Occurrences	5	100.0 %
<u>Injury</u> <u>S</u>	everity (prior to 4.6.19)	
	Occurrence(s)	Percentage

Concord Police Department From: 01/01/2018 Thru: 04/12/2021 Page: 4

NO APPARENT INJURY	5	100.0
Total Occurrences	5	100.0 %
Restraint S	ystem (prior to 4.6.19)	
	Occurrence(s)	Percentage
AIR BAG & SEAT RESTRAINT USED RESTRAINT INSTALLED-USED	1 4	20.0
Total Occurrences	5	100.0 %
<u>Vehicle</u> Occu	upied (prior to 4.6.19)	
	Occurrence(s)	Percentage
USE UNIT (VEHICLE) NUMBER	5	100.0
,		
Total Occurrences	5	100.0 %
Total Occurrences	5 Evere Injury (prior to 4.6.19)	100.0 %
Total Occurrences	•	100.0 %
Total Occurrences Location Of Most Se	evere Injury (prior to 4.6.19)	
Total Occurrences	Occurrence(s)	Percentage
Total Occurrences Location Of Most Se	Occurrence(s)	Percentage 100.0
Total Occurrences Location Of Most Se	Occurrence(s) 5	Percentage 100.0
Total Occurrences Location Of Most Se	Occurrence(s) 5 in Vehicle (prior to 4.6.19)	Percentage 100.0
Total Occurrences Location Of Most Se NONE Total Occurrences Injured Position :	Occurrence(s) 5 in Vehicle (prior to 4.6.19) Occurrence(s)	Percentage 100.0 % Percentage 80.0
Location Of Most Se Location Of Most Se NONE Total Occurrences Injured Position : DRIVER PASSENGER - FRONT RIGHT Total Occurrences	Occurrence(s) 5 in Vehicle (prior to 4.6.19) Occurrence(s)	Percentage 100.0 % Percentage 80.0 20.0

Page: 5

OTHER MOTOR VEHICLE		
OTHER MOTOR VEHICLE	2	100.0
Total Occurrences	2	100.0 %
Tr	raffic Controls (prior to 4.6.19)	
	Occurrence(s)	Percentage
NONE LANE CONTROL	1 1	50.0 50.0
Total Occurrences	2	100.0 %
Ro	oad Conditions (prior to 4.6.19)	
	Occurrence(s)	Percentage
NORMAL	2	100.0
Total Occurrences	2	100.0 %
Lig	ght Conditions (prior to 4.6.19)	
	Occurrence(s)	Percentage
DAYLIGHT	2	100.0
Total Occurrences	2	100.0 %
Weat	ther Conditions (prior to 4.6.19)	
	Occurrence(s)	Percentage
CLEAR	2	100.0
Total Occurrences	2	100.0 %
Ro	oad Alignment (prior to 4.6.19)	
	Occurrence(s)	Percentage

Page: 6

STRAIGHT AND UPGRADE STRAIGHT AT HILLCREST	1 1	50.0 50.0
Total Occurrences	2	100.0 %
Road Desig	n (prior to 4.6.19)	
	Occurrence(s)	Percentage
NOT PHYSICALLY DIVIDED (2-WAY)	2	100.0
Total Occurrences	2	100.0 %
Apparant Roadway	Features (prior to 4.6.19)	
	Occurrence(s)	Percentage
NOT APPLICABLE	2	100.0
Total Occurrences	2	100.0 %
Location First Harm	nful Event (prior to 4.6.19)	
	Occurrence(s)	Percentage
AT INTERSECTION INTERSECTION RELATED	1 1	50.0 50.0
Total Occurrences	2	100.0 %
Apparent Physical (Condition (prior to 4.6.19)	
	Occurrence(s)	Percentage
APPARENTLY NORMAL	4	100.0
Total Occurrences	4	100.0 %
Vision Obscure	ment (prior to 4.6.19)	
	Occurrence(s)	Percentage

Concord Police Department From: 01/01/2018 Thru: 04/12/2021

Page: 7

NO APPARENT OBSCUREMENT 4 100.0

Total Occurrences 4 100.0 %

Appendix E

Adjustment Factors

Seasonal Adjustment Factors NHDOT Group 4 (Urban Highways)

Year 2019 Monthly Data - Urban

		Adjustment to			
Month	ADT	Average	Peak		
Jan	11,431	1.12	1.23		
Feb	11,848	1.08	1.18		
Mar	12,141	1.06	1.15		
Apr	12,860	1.00	1.09		
May	13,551	0.95	1.03		
Jun	13,785	0.93	1.02		
Jul	13,942	0.92	1.01		
Aug	14,016	0.92	1.00		
Sep	13,379	0.96	1.05		
Oct	13,339	0.96	1.05		
Nov	12,265	1.05	1.14		
Dec	11,496	1.12	1.22		

Year 2018 Monthly Data - Urban

		Adjustment to			
<u>Month</u>	ADT	Average	Peak		
Jan	11,282	1.13	1.24		
Feb	11,848	1.08	1.18		
Mar	11,828	1.08	1.18		
Apr	12,491	1.02	1.12		
May	13,587	0.94	1.03		
Jun	13,911	0.92	1.00		
Jul	13,765	0.93	1.01		
Aug	13,945	0.92	1.00		
Sep	13,168	0.97	1.06		
Oct	13,367	0.96	1.04		
Nov	12,215	1.05	1.14		
Dec	11,963	1.07	1.17		

Year 2017 Monthly Data - Urban

		Adjustment to				
<u>Month</u>	ADT	Average	Peak			
Jan	12254	1.21	1.33			
Feb	13494	1.10	1.21			
Mar	14,335	1.03	1.14			
Apr	15004	0.99	1.09			
May	15547	0.95	1.05			
Jun	16310	0.91	1.00			
Jul	15523	0.95	1.05			
Aug	15974	0.93	1.02			
Sep	15546	0.95	1.05			
Oct	15104	0.98	1.08			
Nov	14,544	1.02	1.12			
Dec	14151	1.05	1.15			



STEPHEN G. PERNAW & COMPANY, INC.

PROJECT:

Proposed Mixed-Use Development, Concord, New Hampshire

NUMBER:

2089A

COUNT STATION:

82099073

HISTORICAL GROWTH CALCULATIONS

LOCATION:

NH3A (North of Maitland Street) - Concord, NH

CASE:

AADT

ARITHMETIC PROJECTIONS

YEAR	AADT				PROJEC	TIONS
			Regression Ou	utput:		
2016	7140		Constant	-119034.5	2021	7480
2017	7283		Std Err of Y Est	45.91405	2022	7543
2018	7267		R Squared	0.8229231	2023	7605
2019	7354		No. of Observations	4	2024	7668
2020	6207	DNU	Degrees of Freedom	2	2025	7731
					2026	7793
			X Coefficient	62.6	2027	7856
			Std Err of Coef.	17.782435	2028	7918
					2029	7981
					2030	8044
					2031	8106

RATE = 63 VPD/YEAR

GEOMETRIC PROJECTIONS

YEAR	AADT	Ln AADT			PROJEC	TIONS
			Regression Or	utput:		
2016	7140	8.87347	Constant	-8.54008	2021	7483
2017	7283	8.89330	Std Err of Y Est	0.0063634	2022	7548
2018	7267	8.89110	R Squared	0.8216943	2023	7614
2019	7354	8.90300	No. of Observations	4	2024	7680
2020	6207	DNU	Degrees of Freedom	2	2025	7747
					2026	7814
			X Coefficient	0.0086396	2027	7882
			Std Err of Coef.	0.0028458	2028	7950
					2029	8019
					2030	8089
					2031	8159

CONCLUSION: Use 1% per year

RATE = 0.9 % / YEAR





Transportation Data Management System

List View All DIRs

Location ID	82099073	MPO ID	
Туре	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	S0000003A_	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	NH 3A
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	S Main St		
Loc On Alias	NH 3A (SOUTH MAIN ST) NORTH OF MAITLAND ST		
More Detail			

Directions: 2-WAY @

AADT ②								
	Year	AADT	DHV-30	K %	D %	PA	ВС	Src
2	2020	6,207 ³		12		5,650 (91%)	557 (9%)	Grown from 2019
2	2019	7,354 ³		12		6,737 (92%)	617 (8%)	Grown from 2018
2	2018	7,267	854	12		6,699 (92%)	568 (8%)	
2	2017	7,283 ³				6,759 (93%)	524 (7%)	Grown from 2016
2	016	7,140 ³				6,511 (91%)	629 (9%)	Grown from 2015
<< <		> >>	1-5 of 13	1				

Travel	Demand	Model				A SHOW		1000		
	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

	Date	int	Total
100	Wed 6/20/2018	60	8,212
1	Tue 6/19/2018	60	8,510
40	Thu 6/18/2015	60	8,177
*	Wed 6/17/2015	60	8,224
45	Tue 6/16/2015	60	8,094
45	Thu 6/14/2012	60	9,032
100	Wed 6/13/2012	60	8,729
1	Tue 6/12/2012	60	8,591
*	Sun 5/17/2009	60	3,912

VOLUME TR	END ②
Year	Annual Growth
2020	-16%
2019	1%
2018	0%
2017	2%
2016	2%
2015	-2%
2012	-2%
2009	1%
2006	60%

CALCULATION SHEET



Project:	Mixed-Use Dev.	Job Number:	2089A
Calculated By:	SP	Date:	4/27/2021
Checked By:	CA	Date:	4/27/2021
Sheet No:	1	Of:	11
Subject:	Covid-19 Adjustment Fa	ctor	

Give	ş:	
	IHDOT count station on S. Main Street (north of Maitland Ave)	
+	1. June 2018 average AM peak hour = 651 vehicles (see Appendix B) during pre-pandemic conditions.	
+	2. June 2018 average PM peak hour = 824 vehicles (see Appendix B) during pre-pandemic conditions.	
-	3. April 2021 AM peak hour 508 vehicles south of Maitland Avenue (see Figure 2) during pandemic conditions.	
-	4. April 2021 PM peak hour 678 vehicles south of Maitland Avenue (see Figure 2) during pandemic conditions.	
+	5. Traffic volume north of Maitland Avenue = +0 (AM) and +6 (PM) per supplemental count at Maitland Avenue.	
В. І	eak-month seasonal adjustment factor for June = 1.01 (average three years), for April = 1.10 (average three years) per Appendix E	.
C.	Historical growth rate = 1.0% per year, compounded annually (see Appendix E)	
Calc	late 2021 peak-month volumes north of Maitland Avenue based on June 2018 pre-pandemic conditions	
Α. /	M = 651 x 1.01 ³ x 1.01 = 677 vehicles	
В. І	M = 824 x 1.01 ³ x 1.01 = 857 vehicles	
Calc	ulate 2021 peak-month volumes north of Maitland Avenue based on April 2021 pandemic conditions	
	M = (508+0) x 1.10 = 559 vehicles	
-	M = (678+6) x 1.10 = 752 vehicles	-
	TO TO THE THE WINDOW	
Cale	ulate Covid-19 Adjustment Factors	
T		
-	M Covid-19 factor = 677 / 559 = 1.21	
B, F	M Covid-19 factor = 857 / 752 = 1.14	
-		
		-
+		





Transportation Data Management System

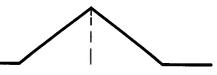


Excel Version

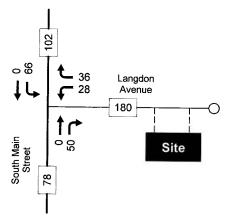
y Volume Re _l	port		
Location ID:	82099073	Type:	SPOT
Located On:	S Main St		
Direction:	2-WAY	. T	
Community:	CONCORD	Period:	Mon 6/18/2018 - Sun 6/24/2018
AADT:	7267		32.02

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		24	35					-	0.4
1:00 AM		15	22					19	
2:00 AM		8	13					1.	<u> </u>
3:00 AM		22	19					2	
4:00 AM		57	29					43	
5:00 AM		170	138					154	Total Control
6:00 AM		259	247					253	
7:00 AM		669	633					651	
8:00 AM		592	580					586	
9:00 AM		454	449				_	452	
10:00 AM		477	434					452	
11:00 AM		549	512						
12:00 PM		561	590					531	
1:00 PM		566	559					576	THE REAL PROPERTY.
2:00 PM		525	505					563	
3:00 PM								515	
4:00 PM		654	659					657	7.9
5:00 PM		854	793)				824	9.8
		718	744					731	8.7
6:00 PM		475	421					448	5.4
7:00 PM		306	243					275	3.3
8:00 PM		246	289					268	3.2
9:00 PM		165	160					163	1.9
10:00 PM		96	92					94	1.1
11:00 PM		48	46					47	0.6
Total	0	8,510	8,212	0	0	0	0		
24hr Total		8510	8212					8,361	
AM Pk Hr		7:00	7:00						
AM Peak		669	633					651	
PM Pk Hr		4:00	4:00						
PM Peak		854	793					824	
% Pk Hr		10.04%	9.66%					9.85%	

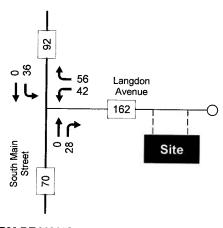
Appendix F Site Generated Traffic Volumes / Trip Distribution



Pernaw & Company, Inc



AM PEAK HOUR



PM PEAK HOUR

Trip Generation Summary

Alternative: Alternative 1

Phase:

Project:

밀

221

710

2089A Gen

Weekday PM Peak Hour of Adjacent Street Traffic Weekday AM Peak Hour of Adjacent Street Traffic Weekday Average Daily Trips

Open Date: 4/21/2021

4/21/2021

Analysis Date:

Total

Exit 32

Enter 51

*

Total

65

83

22

9

4

43

57

84

တ

72

EX 9 84 ဖ Enter 17 62 37 * Total 1045 201 521 EX: 522 100 260 Enter 523 101 261 * 1000 Sq. Ft. GFA **Dwelling Units** OFFICEGENERAL 2 **OFFICEGENERAL 1** MID-RISE 1 Land Use 192 18

1767 1767 0 0 882 0 0 885 885 0 0 Volume Added to Adjacent Streets Internal Capture Trips **Unadjusted Volume** Pass-By Trips

1000 Sq. Ft. GFA

84

710

158

96

178

63

115

0

0

4 0

2 0 62

0 7

162

8 0 0

8

8

8

116

Total Weekday Average Daily Trips Internal Capture = 0 Percent

Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 1 Percent

Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 2 Percent

Custom rate used for selected time period.



Project Location: Concord, NH Project Number: 2089A

TRIP DISTRIBUTION ANALYSIS

TMC Patterns at South Main Street/Langdon Avenue Intersection

		vvec	inesd	ay, A	April 14,	2021		Thu	ırsda	y, Ap	oril 15, 2	021
Combined (5 hrs)												
To/From North =	78	+	59	=	137	58%	71	+	59	=	130	55%
To/From South =	43	+	55	=	<u>98</u>	42%	49	+	58	=	<u>107</u>	45%
					235	100%					237	100%
Combined Both Days												
Combined Both Days						<u>USE</u>						
To/From North =	137	+	130	=	267	57%						
To/From South =	98	+	107	=	<u>205</u>	43%						
					472	100%						

Appendix G Capacity and Level of Service Calculations – Unsignalized

1: South Main Street & Langdon Avenue

Intersection		S/4/230				1999-1
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y	TYDI		NDK	ODL	
Traffic Vol, veh/h		/ =	275	/11	/10	4
	3			-		
Future Vol, veh/h	3	5	275	14	13	215
Conflicting Peds, #/hr	0	0	_ 0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	9,# 0		0			0
Grade, %	0	_	0	_	_	0
Peak Hour Factor	50	50	72	72	84	84
Heavy Vehicles, %	0	67	3	7	04	
Mymt Flow	6	10				4
INTALLIC LOSA	0	10	382	19	15	256
Major/Minor 1	Minor1		Major1	100	Major2	LUG-TES
Conflicting Flow All	678	392	0	0	401	^
Stage 1	392	392		U	401	0
Stage 2			-			-
	286	-	_	_	-	-
Critical Howy	6.4	6.87	-	-	4.1	
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	319.4.3	1
Follow-up Hdwy	3.5	3.903	-	_	2.2	_
Pot Cap-1 Maneuver	421	536		NIE KO	1169	7.12 L
Stage 1	687		_	_	1100	_
Stage 2	767					
Platoon blocked, %	101		-	-	1000	-
	4		-	<u>-</u>		_
Mov Cap-1 Maneuver	415	536	-	-	1169	M 4-9.
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	687	-			1990	
Stage 2	755	-	-	_	_	_
Approach	WB		NB	B. Barrie	SB	Service S
HCM Control Delay, s	12.7		0		0.5	317 25 41
HCM LOS	В					
SELECTION OF THE PARTY OF THE						
		MILES !				
Minor Lane/Major Mvmt		NBT	NBRW	BLn1	SBL	SBT
Capacity (veh/h)					1169	-
HCM Lane V/C Ratio		_	- (0.033 (
HCM Control Delay (s)						-
		-	I STA	12.7	8.1	0
HCM CENT NAME OF THE			-	В	Α	Α
HCM 95th %tile Q(veh)			A 17-11	0.1	0	

1: South Main Street & Langdon Avenue

Intersection				E CHIEFE ST	NATELY A	SHALL SELECTION OF THE PARTY OF
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		1		ODL	अव
Traffic Vol, veh/h	4				/ 16	292 L
Future Vol, veh/h	4	6	373	17	16	292
Conflicting Peds, #/hr	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	0
RT Channelized	otop -	None				Free
Storage Length	0	NOH O	-		A 18 - 5	None
Veh in Median Storage			-	_	-	-
	•	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	72	72	84	84
Heavy Vehicles, %	0	67	3	7	0	4
Mvmt Flow	8	12	518	24	19	348
Major/Minor N	linor1	070.54	Major1	UNGLES.	Major2	SCE S
Conflicting Flow All	916	530	0		542	0
Stage 1	530			0		0
Stage 2	386	- ,	-	-	-	•
-		- 0.07	_	_		-
Critical Hdwy	6.4	6.87	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	- Y	-	-
Follow-up Hdwy		3.903	-	-	2.2	_
Pot Cap-1 Maneuver	305	441		N (all V	1037	
Stage 1	594	-	-	-	-	-
Stage 2	691	-	_			3 8 5
Platoon blocked, %			_	_		_
Mov Cap-1 Maneuver	298	441			1037	
Mov Cap-2 Maneuver	298		_		1007	
Stage 1	594	E6324E	a White and			
Stage 2	675	-			•	(4) (1) - [
Staye 2	0/0	-	-		-	-
Approach	WB	A 10 TO	NB	2306	SB	
HCM Control Delay, s	15.3		0	PERMIT	0.4	JI STEEL
HCM LOS	С		•		0.4	
Minor Lane/Major Mvmt		NBT	NBRW		SBL	SBT
Capacity (veh/h)		-	-	370	1037	
		-	-	0.054	0.018	-
HCM Lane V/C Ratio				450	8.5	0
HCM Control Delay (s)		- 1	-	15.3	0.0	U
HCM Control Delay (s) HCM Lane LOS		-	-	15.3 C		
HCM Control Delay (s)			-		0.5 A 0.1	A -

			·			
Intersection	ES PER	S. CESTO	# E E E	5503312	100000	V/938E
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	CDT
Lane Configurations		MOL		NDR	ODL	SBT
_	33	10	1272	107	/00	4
Traffic Vol, veh/h	32					
Future Vol, veh/h	32	42	373	67	82	292
Conflicting Peds, #/hr		0	_ 0	_ 0	_ 0	_ 0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	_	-	-
Veh in Median Storage	•	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	72	72	84	84
Heavy Vehicles, %	0	67	3	7	0	4
Mvmt Flow	64	84	518	93	98	348
M-104:-						
	Minor1		Major1		/lajor2	0000
Conflicting Flow All	1109	565	0	0	611	0
Stage 1	565	-	-			
Stage 2	544	_	-	-	-	-
Critical Hdwy	6.4	6.87		10 110	4.1	
Critical Hdwy Stg 1	5.4	-	-	-	_	_
Critical Hdwy Stg 2	5.4	+ 30 _	(Q_2)			
Follow-up Hdwy		3.903	_	_	2.2	_
Pot Cap-1 Maneuver	234	420	-	N	978	
Stage 1	573	-120			3/0	-
Stage 2	586	64484				
Platoon blocked, %	500	y // ()	2020 - S		-	-
Mov Cap-1 Maneuver	205	420	_		070	-
		420	-	Ta III	978	-
Mov Cap-2 Maneuver	205	-			_	_
Stage 1	573	7			\\ -	
Stage 2	513	_	-	-	-	-
Approach	WB		NB		SB	E00403-00
						1011 42
HCM Control Delay, s			0		2	
HCM LOS	D					
Minor Lane/Major Mvm	t	NBT	NBRW	/RI n1	SBL	SBT
Capacity (veh/h)		1401	MOIM	289	978	Mark St.
HCM Lane V/C Ratio			-	289 0.512		•
HCM Control Delay (s)		ugasimi ili			0.1	-
HCM Lane LOS		-		29.8	9.1	0
HCM 95th %tile Q(veh)		1010	-	D	A	Α
HOW SOME WIVEN		N		2.7	0.3	

Intersection	2 - 2 2		2551263	S S S S	22/12/0	
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	N/	* * * * * * * * * * * * * * * * * * *	1	INDI	ODL	<u>- 4</u>
Traffic Vol, veh/h	4	6	/	17	16	-
Future Vol, veh/h	4	6	412	17	-	323
Conflicting Peds, #/hr		0	0	0		0
Sign Control	Stop	Stop	Free	Free	-	Free
RT Channelized		None			- 100	None
Storage Length	0	-	_	-	_	-
Veh in Median Storag	e,# 0		0	_		0
Grade, %	0	-	0	_		0
Peak Hour Factor	50	50	72	72	84	84
Heavy Vehicles, %	0	67	3	7	0	4
Mvmt Flow	8	12	572	24	19	385
		-				000
Major/Minor	Minort		Aniand	0.5500	M .: 0	No.
	Minor1		Major1		Major2	
Conflicting Flow All	1007	584	0	0	596	0
Stage 1	584	-	-	-		-
Stage 2	423	0.07	-		-	_
Critical Howy	6.4	6.87	7 - ·	-	4.1	-
Critical Howy Stg 1	5.4	-	-	-	_	_
Critical Howy Stg 2	5.4	2.002	•	-	-	-
Follow-up Hdwy		3.903		_	2.2	-
Pot Cap-1 Maneuver	269	408		-	990	-
Stage 1	561	_	_	-	-	_
Stage 2	665	-	-	-	-	
Platoon blocked, %	000	40.0	-	_		-
Mov Cap-1 Maneuver	263	408	45 - T	-	990	-
Mov Cap-2 Maneuver	263	_	-	-	-	-
Stage 1	561	100		17 K.		-
Stage 2	649	_	-	-	-	-
Approach	WB		NB	US COLUMN	SB	
HCM Control Delay, s			0		0.4	
HCM LOS	С		•		V. 1	
	34143					
Minor Long/Maior M.		MOT	MIDDLE	IDI .	00:	
Minor Lane/Major Mym	L	NBT	NBRW		SBL	SBT
Capacity (veh/h)		-	- 4	334	990	-
HCM Lane V/C Ratio			_		0.019	-
HCM Long LOS		16.97	-	16.5	8.7	0
HCM Lane LOS		_	_	C	A	Α
HCM 95th %tile Q(veh)		•		0.2	0.1	-

Intersection		612650		- Marie	A B 181	all Sales
Int Delay, s/veh	4.8					
Movement	WBL	MIDD	NIDT	NDD	CDI	COT
Lane Configurations		WBR		NBR	SBL	SBT
Traffic Vol, veh/h	32	/ 42	412	67	/ 02	4 ↑
Future Vol, veh/h	32	42 42	412	67		323
Conflicting Peds, #/hr	0	42	0	0	82	323
Sign Control	Stop	Stop	Free	Free	0 Free	0
RT Channelized	Stop -	None	riee -			Free None
Storage Length	0	NONE		NONE	-	None
Veh in Median Storage			0		_	-
Grade, %	•	4.6 · •		1311	-	0
Peak Hour Factor	0 50	- E0	0	70	- 04	0
		50	72	72	84	84
Heavy Vehicles, %	0	67	3	7	0	4
Mvmt Flow	64	84	572	93	98	385
Major/Minor I	Minor1	16696	Major1		Major2	Mark Street
Conflicting Flow All	1200	619	0	0	665	0
Stage 1	619					SKALL
Stage 2	581	-	_	_	_	-
Critical Hdwy	6.4	6.87	18 7 24		4.1	
Critical Hdwy Stg 1	5.4	_	_	_	-	_
Critical Hdwy Stg 2	5.4			10-81		Saylin.
Follow-up Hdwy		3.903	_	-	2.2	_
Pot Cap-1 Maneuver	206	389		16964	934	
Stage 1	541	-	_	_		-
Stage 2	563					
Platoon blocked, %			-	-		_
Mov Cap-1 Maneuver	179	389			934	
Mov Cap-2 Maneuver	179	-	_	-	-	_
Stage 1	541	ALL Y.			118004	
Stage 2	488	-	_		-	_
Annuach	1815	Charles and	115	and the later of t		
Approach	WB	SEE SEE	NB	Manage	SB	NAME OF TAXABLE PARTY.
HCM Control Delay, s			0		1.9	
HCM LOS	E					
Minor Lane/Major Mvm	t	NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)				258	934	-
HCM Lane V/C Ratio		_		0.574		-
HCM Control Delay (s)		A CHILL		36.2	9.3	0
HCM Lane LOS		-		E	Α	A
HCM 95th %tile Q(veh)			NA DE	3.3	0.3	
				-10	0,0	

Intersection		123200	NAME OF THE OWNER,	80/19959		
Int Delay, s/veh	0.9	1100		N/S N/S		
		14/55			4	
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y	100	4	1	1	भ
Traffic Vol, veh/h	15		243	•	/ 18	
Future Vol, veh/h	15	19	243	4		398
Conflicting Peds, #/hr	0	0	_ 0	_ 0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	,#0	-	0			0
Grade, %	0	-	0	_	-	0
Peak Hour Factor	77	77	91	91	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	25	267	4	21	468
				•	Am 1	100
Main-//Min						
	/linor1		Major1		Major2	
Conflicting Flow All	779	269	0	0	271	0
Stage 1	269		-	-		-
Stage 2	510	-	-	-	-	_
Critical Hdwy	6.4	6.2			4.1	AT YOU
Critical Hdwy Stg 1	5.4	-	_	-	-	_
Critical Hdwy Stg 2	5.4	enrow?		13502		391.1910
Follow-up Hdwy	3.5	3.3	_	_	2.2	_
Pot Cap-1 Maneuver	367	775			1304	
Stage 1	781	.,,			1304	-
Stage 2	607			le serios		
Platoon blocked, %	007	-	4764	•	•	-
	250	775		-	1001	_
Mov Cap-1 Maneuver	359	775	-	-	1304	Tools !
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	781	-	-	10 J.	-	
Stage 2	594	-	-	-	-	-
Approach	WB		NB	395000	SB	5/8/2000
HCM Control Delay, s	12.7			22/9/2012/03		THE PARTY OF
HCM LOS			0		0.3	
HOW LOS	В					
Minor Lane/Major Mvmt		NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)					1304	
HCM Lane V/C Ratio		_	- 1	0.086		_
HCM Control Delay (s)				12.7	7.8	0
HCM Lane LOS		_		В	Α.	A
HCM 95th %tile Q(veh)				0.3	0.1	A .
				0.0	0.1	

Intersection	HARRIS	1000		25/81		1683
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	11011	1	IVE	ODL	4
Traffic Vol, veh/h	17,	/ 22.	/311	/ 5	121	509
Future Vol, veh/h	17	22	311	5		509
Conflicting Peds, #/hr		0	0	0	0	0
Sign Control	Stop	Stop	Free	Free		Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storag	e,# 0	-	0		5 BV 3	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	91	91	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	22	29	342	5	25	599
Major/Minor	Minor1	N	Major1	100	Major	VENDOUS DE
Conflicting Flow All	994	345			Major2	^
Stage 1	345		0	0	347	0
Stage 2	649	-	-	-	- 15 - 15 - 15 - 15 - 15 - 15 - 15 - 15	1 5 × -/
Critical Howy	6.4	6.2	_	_	- 11	
Critical Hdwy Stg 1	5.4		-		4.1	-
Critical Hdwy Stg 2	5.4	_	_	-	_	-
Follow-up Hdwy	3.5	3.3		-	2.2	
Pot Cap-1 Maneuver	274	702		_	2.2	
Stage 1	722	102	-	-	1223	-
		12010-0	_	_		
Stage 2	524	-	-	-	-	-
Platoon blocked, %	200	700			4000	-
Mov Cap-1 Maneuver	266	702	-	-	1223	-
Mov Cap-2 Maneuver	266	_	-	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	508	_	_	_	_	-
Approach	WB	19/1/2	NB	3000	SB	1000
HCM Control Delay, s	15		0	REVER	0.3	
HCM LOS	С					
Minor Lane/Major Mvm	ıt	NBT	NBRW	Rin1	SBL	CDT
Capacity (veh/h)						SBT
HCM Lane V/C Ratio		-	-	409	1223	-
HCM Control Delay (s)		_	- (0.124	0.02	-
HCM Lane LOS		-		15	8	0
HCM 95th %tile Q(veh)			_	C	A	Α
TOM JOHN JOHN CALABIT		-	-	0.4	0.1	•

Intersection			O TOWN	20000		NAME OF
Int Delay, s/veh	4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥	_	4			स
Traffic Vol, veh/h	59,	78	311.	/ 33	/ 57,	
Future Vol, veh/h	59	78	311	33		509
Conflicting Peds, #/hr	0	0	0	0		0
Sign Control	Stop	Stop	Free	Free		Free
RT Channelized		None		None		
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e, # 0		0	-		0
Grade, %	0	-	0	_	-	0
Peak Hour Factor	77	77	91	91	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	77	101	342	36	67	599
Major/Minor I	Minort		Aninad	NAME OF TAXABLE PARTY.	M-: 0	DESCRIPTION OF THE PARTY OF THE
	Minor1		Major1		Major2	_
Conflicting Flow All	1093	360	0	0	378	0
Stage 1 Stage 2	360			-	-	-
~	733	- 00		_	_	_
Critical Howy	6.4	6.2	Savara	-	4.1	-
Critical Hdwy Stg 1	5.4	_	_	_	_	-
Critical Hdwy Stg 2	5.4	-		1995 -	-	-
Follow-up Hdwy	3.5	3.3	_	-	2.2	-
Pot Cap-1 Maneuver	239	689	-		1192	
Stage 1	710	_	-	-	-	-
Stage 2	479		62		-	-
Platoon blocked, %			_	-		-
Mov Cap-1 Maneuver	219	689			1192	-
Mov Cap-2 Maneuver	219	-	-	-	-	-
Stage 1	710		-	-	40	-
Stage 2	439	-	-	-	-	-
Approach	WB		NB	0/45/58	SB	Owne.
HCM Control Delay, s	24.6		0		0.8	
HCM LOS	C		v		0.0	
M: 1						
Minor Lane/Major Mvm	T.	NBT	NBRW		SBL	SBT
Capacity (veh/h)			-	358	1192	
HCM Lane V/C Ratio		-	-	0.497		-
HCM Control Delay (s)		-	-	24.6	8.2	0
HCM Lane LOS		-	_	С	Α	Α
HCM 95th %tile Q(veh)		-01-	-	2.7	0.2	

Movement WBL WBR NBT NBR SBL SBT					-		
Movement	Intersection	3000	2 24		DE DE		100
Traffic Vol, veh/h	Int Delay, s/veh	0.9					THE REAL PROPERTY.
Traffic Vol, veh/h	Movement	WRI	WRP	NRT	NRP	CDI	CDT
Traffic Vol, veh/h Future Vol,			AADIX		NDK	ODL	
Future Vol, veh/h Conflicting Peds, #/hr O O O O O O O O O O O O O O O O O O O			/ 22		/5	/21	1500
Conflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0							
Sign Control Stop RT Channelized Stop None Free Free Free Free None Free None Free None Free None RT Channelized None No							
RT Channelized - None - None - None Storage Length 0 - 0 - 0 - 0 - 0 - 0 Grade, % 0 - 0 - 0 - 0 - 0 - 0 Grade, % 0 - 0 - 0 - 0 - 0 - 0 Grade, % 0 - 0 0 - 0 - 0 0 - 0 Grade, % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0							
Storage Length							
Weh in Median Storage, # 0 - 0 - - 0 Grade, % 0 - 0 - - 0 Peak Hour Factor 77 77 91 91 85 85 Heavy Vehicles, % 0 0 0 0 0 0 0 Mover Flow 22 29 378 5 25 661 Major/Minor Minor1 Major1 Major2 Major2 Major2 Conflicting Flow All 1092 381 0 383 0 Stage 1 381 - - - - Stage 2 7111 - - - - Critical Howy Stg 1 5.4 - <td< td=""><td></td><td></td><td></td><td>_</td><td></td><td></td><td>NONE</td></td<>				_			NONE
Grade, %			S1613	0			n
Peak Hour Factor 77 77 91 91 85 85 Heavy Vehicles, % 0 0 0 0 0 0 0 Mymt Flow 22 29 378 5 25 661 Major/Minor Minor1 Major1 Major2 Conflicting Flow All 1092 381 0 0 383 0 Stage 1 381 -							
Heavy Vehicles, %							
Major/Minor Minor1 Major1 Major2 Conflicting Flow All 1092 381 0 0 383 0 Stage 1 381 Stage 2 711 Critical Hdwy 6.4 6.2 - 4.1 - Critical Hdwy Stg 1 5.4 Critical Hdwy Stg 2 5.4							
Major/Minor Minor1 Major1 Major2 Conflicting Flow All 1092 381 0 0 383 0 Stage 1 381 -	Mvmt Flow						
Stage 1 381 0 0 383 0 Stage 1 381 Stage 2 711 Stage 2 5.4 Stage 1 5.4 Stage 2 5.4 Stage 1 695 Stage 2 490 Stage 2 490 Stage 2 490 Stage 2 490 Stage 1 695 Stage 1 695 Stage 1 695 Stage 2 474			20	0,0	J	2.0	001
Stage 1 381 0 0 383 0 Stage 1 381 Stage 2 711 Stage 1 5.4 Stage 1 5.4 Stage 2 5.4 Stage 1 695 Stage 2 490 Stage 2 490 Stage 2 490 Stage 1 695 Stage 1 695 Stage 1 695 Stage 2 474	14 - 1 - 1						
Stage 1 381 - -							1000
Stage 2	Conflicting Flow All		381	0	0	383	0
Critical Hdwy Stg 1 5.4 4.1 - Critical Hdwy Stg 1 5.4	-		146-	13-			
Critical Holwy Stg 1 5.4				-	-		-
Critical Hdwy Stg 2 5.4 -	Critical Hdwy		6.2	-	35 -	4.1	
Follow-up Hdwy 3.5 3.3 - 2.2 - Pot Cap-1 Maneuver 240 671 - 1187 - Stage 1 695 Stage 2 490 Platoon blocked, % 1187 - Mov Cap-1 Maneuver 232 671 - 1187 - Mov Cap-2 Maneuver 232 Stage 1 695 Stage 2 474 Stage 2 474 Pipproach WB NB SB ICM Control Delay, s 16.3 0 0.3 ICM LOS C Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT Rapacity (veh/h) - 368 1187 - CM Lane V/C Ratio - 0.138 0.021 - ICM Control Delay (s) - 16.3 8.1 0 ICM Control Delay (s) - 16.3 8.1 0 ICM Control Delay (s) - C A A			-	-	-	-	-
Stage 1	Critical Hdwy Stg 2			A VIII			
Stage 1 695 -	Follow-up Hdwy			-	-		_
Stage 2	Pot Cap-1 Maneuver		671	Silve		1187	
Platoon blocked, %			-	-	-	-	-
Mov Cap-1 Maneuver 232 671 1187 - Mov Cap-2 Maneuver 232 Stage 1 695 Stage 2 474 Stage 2 474 Stage 2 474 Stage 3 695 Stage 4 695 Stage 5 474 Stage 6 474 Stage 7 474 Stage 8 187 - Stage 9 474 Stage 9 474 Stage 1 695 Stage 1 695 Stage 2 474		490	-	100		-	
Stage 1	Platoon blocked, %			-	-		-
Stage 1 695 -	Mov Cap-1 Maneuver		671		-	1187	
Stage 2	Mov Cap-2 Maneuver		-	-	_	-	-
CM Control Delay, s 16.3 0 0.3	Stage 1	695					
CM Control Delay, s 16.3 0 0.3	Stage 2	474	-	-	-	-	
CM Control Delay, s 16.3 0 0.3							
CM Control Delay, s 16.3 0 0.3	Annroach	MP	734000	ND		CD	Sarphase.
CM LOS C		- ATTACHED			Total post		A COLUMN
SBL SBT SBL SBT SBL SBT SBL SBT SBC SBT SBC SBT SBC SBT SBC SBT SBC SBT SBC				U		0.3	
Japacity (veh/h) - - 368 1187 - CM Lane V/C Ratio - - 0.138 0.021 - CM Control Delay (s) - - 16.3 8.1 0 CM Lane LOS - C A A	FIGHT LOG						
Japacity (veh/h) - - 368 1187 - CM Lane V/C Ratio - - 0.138 0.021 - CM Control Delay (s) - - 16.3 8.1 0 CM Lane LOS - C A A				30 DAY			
CM Lane V/C Ratio - - 0.138 0.021 - - ICM Control Delay (s) - - 16.3 8.1 0 0 CM Lane LOS - C A A	Minor Lane/Major Mvm	it	NBT	NBRW	/BLn1	SBL	SBT
CM Control Delay (s) - - 16.3 8.1 0 CM Lane LOS - - C A A	Capacity (veh/h)				368	1187	
CM Lane LOS C A A	HCM Lane V/C Ratio		-	- 1	0.138	0.021	-
CM Lane LOS C A A	HCM Control Delay (s)		1		16.3	8.1	0
	HCM Lane LOS		-	-	С	Α	Α
	HCM 95th %tile Q(veh)			\	0.5		

Note	Interception	THE STATE OF THE S		RESERVED IN	20022000000		
WBL WBR NBT NBR SBL SBT MBR SBL SBT STATE	Intersection	4 4		STATE OF STREET		OTTO HE	MARKET S
ane Configurations raffic Vol, veh/h 59 78 344 33 57 562 onflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-	4.4					
raffic Vol, veh/h uture Vol, veh/h 59 78 344 33 57, 562 uture Vol, veh/h 59 78 344 33 57, 562 onflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Movement		WBR	NBT	NBR	SBL	SBT
raffic Vol, veh/h uture Vol, veh/h 59	Lane Configurations	Υ	/	1		,	
uture Vol, veh/h onflicting Peds, #/hr officing Peds, #/hr officin	Traffic Vol, veh/h	59	/ 78,		/ 33	V 57,	/ 562
Stop Stop Free Free Free Free Free Tree	Future Vol, veh/h	59	78	344	33		
T Channelized	Conflicting Peds, #/hr	0	0	0	0	0	0
T Channelized	Sign Control	Stop		Free	Free	Free	
torage Length 0 - 0 - 0 - 0 - 0 rade, % 0 - 0 - 0 - 0 rade, % 0 - 0 - 0 - 0 rade, % 0 - 0 - 0 - 0 rade, % 0 - 0 0 - 0 0 rade, % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RT Channelized		None	Mara	None		None
rade, % 0 - 0 - 0 - 0 0 0 0 0 0 0 0 0 0 0 0 0	Storage Length	0	-	-	-	-	_
rade, % 0 - 0 - 0 - 0 0 0 0 0 0 0 0 0 0 0 0 0	Veh in Median Storage	,# 0		0			0
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eavy Vehicles, % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Peak Hour Factor		77				
April							
Agior/Minor Minor1 Major1 Major2							
Stage 1 396 Stage 2 795	MANUEL IOM	11	101	3/0	30	0/	661
Stage 1 396 Stage 2 795							
Stage 1 396		/linor1	1	Major1	6906	Major2	YAS IN
Stage 1 396	Conflicting Flow All	1191					0
Stage 2 795							
itical Hotwy Stg 1 5.4	Stage 2		_	_	-	_	_
itical Howy Stg 1 5.4	Critical Hdwy		6.2			41	100
itical Howy Stg 2 5.4				_	_	7.1	
Stage 1							
Stage 1 684							
Stage 1 684				_			
Stage 2 448			000	-	() ·	1156	•
atoon blocked, % DV Cap-1 Maneuver 190 658 1156 - DV Cap-2 Maneuver 190			_	_	-	-	_
Ov Cap-1 Maneuver 190 658 - - 1156 - Ov Cap-2 Maneuver 190 -		448	-	-	-	-	
Stage 1 684				-	-		-
Stage 1 684 -			658	-	SEL P	1156	
Stage 2 407	Mov Cap-2 Maneuver	190	-	-	-	-	-
Description	Stage 1	684					-
CM Control Delay, s 29.6	Stage 2	407	-	-	_	_	-
CM Control Delay, s 29.6							
CM Control Delay, s 29.6	Anna L	ME	-		al Terror arrange		******
CM LOS D nor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT pacity (veh/h) - 319 1156 - EM Lane V/C Ratio - 0.558 0.058 - EM Control Delay (s) - 29.6 8.3 0 0 EM Lane LOS - D A A					of Feed		
nor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT pacity (veh/h) - 319 1156 - CM Lane V/C Ratio - 0.558 0.058 - CM Control Delay (s) - 29.6 8.3 0 CM Lane LOS - D A A				0		0.8	
pacity (veh/h) - - 319 1156 - M Lane V/C Ratio - - 0.558 0.058 - M Control Delay (s) - - 29.6 8.3 0 M Lane LOS - D A A	HCM LOS	D					
pacity (veh/h) - - 319 1156 - M Lane V/C Ratio - - 0.558 0.058 - M Control Delay (s) - - 29.6 8.3 0 M Lane LOS - D A A							
pacity (veh/h) - - 319 1156 - M Lane V/C Ratio - - 0.558 0.058 - M Control Delay (s) - - 29.6 8.3 0 M Lane LOS - D A A	Minor Lane/Major Mymt		NRT	NRRW	/RI n1	SRI	SPT
M Lane V/C Ratio - 0.558 0.058 - M Control Delay (s) - 29.6 8.3 0 M Lane LOS - D A A		NAME OF TAXABLE PARTY.	The second	INDIAN			
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M Lane LOS D A A				_			
				-			
- 3.2 0.2 - 3.2 o.2 -							Α
	101vi 95th %tile Q(veh)		- L		3.2	0.2	-

Appendix H

Auxiliary Turn Lane Analysis



Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

2-lane roadway (English) INPUT

	Value
85 th percentile speed, mph:	30
Percent of left-turns in advancing volume (V _A), %:	2%
Advancing volume (V_A) , veh/h:	308
Opposing volume (V _O), veh/h:	390
Variable	Value
Limiting advancing volume (V _A), veh/h:	562
Guidance for determining the need for a major-road left-turn bay:	bay:
Left-turn treatment NOT warranted.	

Variable	Value
Limiting advancing volume (V _A), veh/h:	562
Guidance for determining the need for a major-road left-turn bay:	bay:
Left-turn treatment NOT warranted.	

Left-turn treatment warranted. Advancing Volume (V_A), veh/h Left-turn treatment not warranted.

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane. s:	6,



Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

2-lane roadway (English) INPUT

Variable	Value
5th percentile speed, mph:	30
ercent of left-turns in advancing volume (V _A), %:	4%
dvancing volume (V _A), veh/h:	530
pposing volume (V _O), veh/h:	316

OUTPUT

Variable	Value
Limiting advancing volume (V _A), veh/h:	689
Guidance for determining the need for a major-road left-turn bay:	oay:
off-tury TON treatment NO I	

Left-turn treatment NO | warranted.

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	0.1

	700
Left-turn treatment warranted.	009
Left-turn tr	500 , veh/h
	400 me (V_A)
	200 300 400 500 Advancing Volume (V _A), veh/h
-	200 \dvanci
Left turn treatment not warranted.	100
800 600 600 500 100 100	0
A'Aəv ,(مV) əmuloV gnizoqqC)



Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

2-lane roadway (English)

Variable	Value
85 th percentile speed, mph:	30
Percent of left-turns in advancing volume (V _A), %:	22%
Advancing volume (V _A), veh/h:	374
Opposing volume (V _O), veh/h:	440

OUTPUT

Variable	Value
Limiting advancing volume (V _A), veh/h:	286
Guidance for determining the need for a major-road left-turn bay:	bay:
Left-turn treatment warranted.	

Left-turn treatment warranted. Advancing Volume (VA), veh/h Left-turn treatment not warranted. Opposing Volume (V_O), veh/h

י מוכם	0.000
3.0	Average time for making left-turn, s:
5.0	Critical headway, s:
2	ritical headway, s:



Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

2-lane roadway (English)

7 6	Variable	Value
1	35 th percentile speed, mph.	30
	Percent of left-turns in advancing volume (V _A), %:	10%
	Advancing volume (V _A), veh/h:	566
	Opposing volume (V _c) veh/h	ACC

OUTPUT

Variable	Value
Limiting advancing volume (V _A), veh/h:	439
Guidance for determining the need for a major-road left-turn bav:	
Left-turn treatment warranted	

Left-turn treatment warranted. Advancing Volume (VA), veh/h Left-turn treatment not warranted. Opposing Volume (V_O), veh/h

	Value	Valiable Oldala
Average time for making left-turn, s:	3.0	verage time for making left-turn, s:
ritical headway, s:	50	ritical headway, s:



Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

2-lane roadway ▼	
Variable	Value
Major-road speed, mph:	30
Major-road volume (one direction), veh/h:	479
Right-turn volume, veh/h:	67

OUTPUT	
Variable	Value
Limiting right-turn volume, veh/h:	678
Guidance for determining the need for a major-road	
right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bav.	

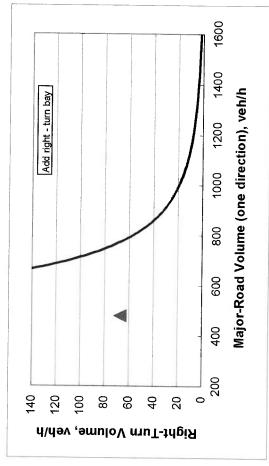




Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT		
2-lane roadway ▼		
Variable	Value	140
Major-road speed, mph:	30	/ प :
Major-road volume (one direction), veh/h:	377	
turn volume, veh/h:	33	100 'au
		08 unjo
		ν۸

OUTPUT	
Variable	Value
Limiting right-turn volume, veh/h:	2150
Guidance for determining the need for a major-road	
right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

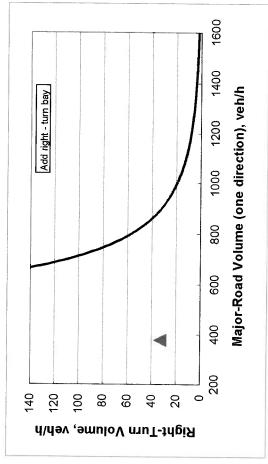




Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

L oile/		(uo	ito	aire dive	300 4/\p	Value	250 200		80
Variable	Major-road volume (total of both directions), veh/h:	Percentage of right-turns on minor road, %:	Minor-road volume (one direction), veh/h:		OUTPUT	Variable	Limiting minor-road volume (one direction), veh/h:	Guidance for determining minor-road approach geometry:	ONE approach lane is o.k.

Consider two approach lanes

ואוווסו ואסמת	Critical gap, s:	Critical gap, s: Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

^{*} according to Table 17 - 5 of the HCM

I^{-}	2000	
1	1800	veh/h
	1600	ions).
	1400	direct
	1200	Major-Road Volume (total of both directions). veh/h
	1000	totalo
s o.k.		ume (1
ch lane i		lo Vol
e approa	400	or-Ro
	200	Maj
	One approach lane is o.k.	O 200 400 600 800 1000 1200 1400 1600 1800 2000



Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

	200			400	(300		200		5	3		0
	'(uoi	106	ərik	ə əu		цə, шn		Λp	BO	Я	Iou	ŀΜ
Auley	966	57%	137				Value	221					
Variable	Major-road volume (total of both directions), veh/h:	Percentage of right-turns on minor road, %:	Minor-road volume (one direction), veh/h:			OUTPUT	Variable	Limiting minor-road volume (one direction), veh/h:	Guidance for determining minor-road approach geometry:	ONE approach lane is o.k.			

Consider two approach lanes

Variable	Value
Limiting minor-road volume (one direction), veh/h:	221
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS		
Minor Road	Critical gap, s.	Critical gap, s. Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0
* according to Table 17 - 5 of the HCM		

800

900

200

One approach lane is o.k.

Major-Road Volume (total of both directions), veh/h

Appendix I Sight Distance Photographs



Pernaw & Company, Inc

Looking Left



Looking Right



Appendix