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1. EXECUTIVE SUMMARY

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the proposed Idlewild Road Mixed Use development to be located along Idlewild Road, east of I-485 in Matthews and Stallings, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development.

The site is proposed to be constructed in two phases. Phase 1 will consist of up to 127 multifamily low-rise homes, and 270 multifamily mid-rise homes. An additional 121 multifamily low-rise homes, a 120-room hotel, a 20,000 square foot medical office, 10,000 square feet of shopping center, and a 6,000 square foot sit-down restaurant will also be built in the 2020 Full Build scenario. The existing Rite Aid Driveway would provide access to Phase 1. One site access is expected to be built on Idlewild Road as a right-in / right-out with a left over. This access would be constructed after Phase 1. The site is expected to be fully built by the year 2020.

The study area for the TIS was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the Towns of Matthews and Stallings and consists of the following intersections:

1. Idlewild Road and Matthews-Mint Hill Road (roundabout)
2. Idlewild Road and Stallings Road
3. Idlewild Road and I-485 Southbound Ramps
4. Idlewild Road and I-485 Northbound Ramps
5. Idlewild Road and Marshall Hooks Road / Access A (right-in / right out / left-in)
6. Idlewild Road and Rite Aid Driveway
7. Idlewild Road and Stevens Mill Road
8. Idlewild Road and Crismark Drive
9. Idlewild Road and Rockwell Drive

Based on coordination with the NCDOT, the Town of Matthews, and the Town of Stallings no offsite developments were determined to have an impact on the project study area.

Several scenarios were analyzed using traffic analysis software. Traffic operations during the weekday AM and PM peak hours were modeled for each scenario. The results of each scenario were compared in order to determine impacts from background traffic growth and the proposed development. The following scenarios were modeled:

- 2018 Existing
- 2020 No-Build
- 2020 Phase 1
- 2020 Build
- 2040 No-Build
- 2040 Build

The following improvements are recommended to be done the developer:

Idlewild road and Matthews-Mint Hill Road

- No improvements are recommended.

Idlewild Road and Stallings Road

- No improvements are recommended.

Idlewild Road and I-485 Southbound Ramps

- No improvements are recommended.

Idlewild Road and I-485 Northbound Ramps

- No improvements are recommended.

Idlewild Road and Marshall Hooks Road / Access A

The following improvements should be implemented prior to Full Build construction:

- Construct Access A with one ingress lane and one egress lane (right only).
- Construct a concrete median to restrict access to right-in, right-out, left-in on both sides of Idlewild Road.
- Extend the westbound Idlewild Road left turn lane to provide 125 feet of storage and appropriate taper.
- Construct an eastbound Idlewild Road right turn lane with 100 feet of storage and appropriate taper.

Idlewild Road and Rite Aid Driveway

The following improvements should be implemented prior to Phase 1 construction:

- Construct a northbound right turn lane on the Rite Aid Driveway with 300 feet of storage and appropriate taper.
- Modify the signal as necessary.

The following improvements should be implemented prior to Full Build construction:

- Extend the northbound right turn lane on the Rite Aid Driveway to provide 500 feet of storage and appropriate taper.

Idlewild Road and Stevens Mill Road

The following improvements should be implemented prior to Phase 1 construction:

- Construct a northbound right turn lane on Stevens Mill Road with 175 feet of storage and appropriate taper.
- Modify the signal as necessary.
- Consideration should be given to the extent of improvements done by the developer due to the expected capacity issues without the proposed site trips and the future improvements planned as part of U-4913. Payment in lieu of roadway improvements by the developer should also be considered.

Idlewild Road and Crismark Drive

- No improvements are recommended.

Idlewild Road and Rockwell Drive

- No improvements are recommended.

The following improvements to the U-4913 design are recommended:

Idlewild road and Matthews-Mint Hill Road

- No improvements are recommended.

Idlewild Road and Stallings Road

- No improvements are recommended.

Idlewild Road and I-485 Southbound Ramps

- No improvements are recommended.

Idlewild Road and I-485 Northbound Ramps

- No improvements are recommended.

Idlewild Road and Marshall Hooks Road / Access A

- No improvements are recommended.

Idlewild Road and Rite Aid Driveway

- Provide 400 feet of storage on each of the northbound Rite Aid Driveway dual left turn lanes.
- Provide 300 feet of storage on the northbound Rite Aid Driveway right turn lane.

Idlewild Road and Stevens Mill Road

- Provide 425 feet of storage on the westbound Idlewild Road left turn lane.
- Construct dual left turn lanes instead of a single left turn lane on northbound Stevens Mill Road. The dual left turn lanes would need 225 feet of storage on each lane.

Idlewild Road and Crismark Drive

- No improvements are recommended.

Idlewild Road and Rockwell Drive

- No improvements are recommended.

2. INTRODUCTION

2.1. Purpose of Report

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the proposed Idlewild Road Mixed Use development to be located along Idlewild Road, east of I-485 in Matthews and Stallings, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development.

2.2. Study Objectives

The site is proposed to be constructed in two phases. Phase 1 will consist of up to 127 multifamily low-rise homes, and 270 multifamily mid-rise homes. An additional 121 multifamily low-rise homes, a 120-room hotel, a 20,000 square foot medical office, 10,000 square feet of shopping center, and a 6,000 square foot sit-down restaurant will also be built in the 2020 Full Build scenario. The existing Rite Aid Driveway would provide access to Phase 1. One site access is expected to be built on Idlewild Road as a right-in / right-out with a left over. This access would be constructed after Phase 1. The site is expected to be fully built by the year 2020.

Refer to Figure 1 in Appendix A for an illustration of the site location. Refer to Figure 2 for the preliminary site plan. The objective of this report is to determine what geometric improvements are necessary to mitigate traffic conditions on the transportation network surrounding the site with the proposed development fully built out.

3. AREA CONDITIONS

3.1. Transportation Network Study Area

3.1.1. Area Roadway System

The project study area for this TIS was determined through coordination with the North Carolina Department of Transportation (NCDOT), the Town of Matthews, and the Town of Stallings. Table 1 summarizes the characteristics of the roadways within the study area. The NCDOT Functional Class map was used to determine the classification of each road. Traffic Volume maps from NCDOT were used to find the average daily traffic (ADT) volumes in vehicles per day (vpd) for

the roadways. A field visit was conducted to verify the existing cross-sections and speed limits in mph.

TABLE 1
STUDY AREA ROADS

ROADWAY	CLASSIFICATION	CROSS-SECTION	ADT (vpd)	SPEED LIMIT (mph)
Idlewild Road	Minor Arterial	Two-Lane	27,000	45
Matthews-Mint Hill Road	Principal Arterial	Two-Lane	19,000	45
Stallings Road	Local	Two-Lane	N/A	45
I-485	Interstate	Two-Lane	69,000	70
Marshall Hooks Road	Local	Two-Lane	N/A	Not Posted
Stevens Mill Road	Major Collector	Two-Lane	8,300	45
Crismark Drive	Local	Two-Lane	N/A	25
Rockwell Drive	Local	Two-Lane	N/A	25

3.1.1.1. Existing Roadway Conditions

Existing lane configurations (number of traffic lanes on the intersection approach), storage capacities, and other intersection and roadway information within the study area was collected through field reconnaissance by Ramey Kemp and Associates, Inc. (RKA). Refer to Figure 3 for the existing lane configurations and traffic control at study intersections.

3.1.1.2. Future Roadway Conditions

The NCDOT STIP Project U-4913 was identified as an approved roadway project within the project study area. This project would widen Idlewild Road from Stallings Road to Stevens Mill Road. No preferred alternative had been identified for U-4913 at the time this TIS was prepared.

3.1.2. Study Area and Existing Traffic Volumes

The study area for the TIS was determined through coordination with NCDOT, the Town of Matthews, and the Town of Stallings and consists of the following intersections:

1. Idlewild Road and Matthews-Mint Hill Road (roundabout)
2. Idlewild Road and Stallings Road
3. Idlewild Road and I-485 Southbound Ramps

4. Idlewild Road and I-485 Northbound Ramps
5. Idlewild Road and Marshall Hooks Road / Access A (right-in / right out / left-in)
6. Idlewild Road and Rite Aid Driveway
7. Idlewild Road and Stevens Mill Road
8. Idlewild Road and Crismark Drive
9. Idlewild Road and Rockwell Drive

Existing traffic volumes were determined through traffic counts conducted during the AM peak period (7:00-9:00 AM) and the PM peak period (4:00-6:00 PM). Turning movement counts were performed at intersections 1, 2, 8, and 9 on October 2, 2018. Turn movement counts at intersections 3 through 7 were performed on June 6, 2018. All counts were performed while schools were in session. The traffic volumes were balanced between intersections where appropriate. Turn movements with no volume were given a value of 4 vehicles per hour for purposes of this study. A copy of the traffic count data can be found in Appendix B of this report. Refer to Figure 4 for an illustration of the existing peak hour traffic volumes.

3.2. Study Area – Adjacent Land Use

3.2.1. Existing Land Uses

The existing site is undeveloped. The surrounding land is primarily commercial and residential.

3.2.2. Anticipated or Approved Future Development

Based on coordination with NCDOT, the Town of Matthews and the Town of Stallings, no offsite developments were determined to have an impact on the project study area.

4. PROJECTED TRAFFIC

4.1. Site Traffic

In order to determine the future traffic conditions after the proposed development is completed, an estimate of traffic projected to travel to / from the proposed development is required. The average weekday daily, AM peak hour, and PM peak hour site trips for this study were calculated based on the ITE *Trip Generation Manual, 10th Edition*.

4.1.1. Trip Generation

The site is proposed to be constructed in two phases. Phase 1 will consist of up to 127 multifamily low-rise homes, and 270 multifamily mid-rise homes. An additional 121 multifamily low-rise homes, a 120-room hotel, a 20,000 square foot medical office, 10,000 square feet of shopping center, and a 6,000 square foot sit-down restaurant will also be built in the 2020 Full Build scenario. The existing Rite Aid Driveway would provide access to Phase 1. One site access is expected to be built on Idlewild Road as a right-in / right-out with a left over. This access would be constructed after Phase 1. The site is expected to be fully built by the year 2020. Table 2 summarizes the trip generation for the 2020 Phase 1 scenario while Table 3 summarizes the trip generation for 2020 Full Build scenario.

TABLE 2
PROPOSED SITE PHASE 1 TRIP GENERATION

LAND USE	SIZE	DAILY TRIPS (VPD)	PEAK HOUR TRIPS (VPH)			
			AM		PM	
			ENTER	EXIT	ENTER	EXIT
Multifamily-low (220)	127 DU	920	14	46	46	27
Multifamily-mid (221)	270 DU	1,470	24	67	70	45
Total New External Trips		2,390	38	113	116	72

TABLE 3
PROPOSED SITE FULL BUILD TRIP GENERATION

LAND USE	SIZE	DAILY TRIPS (VPD)	PEAK HOUR TRIPS (VPH)			
			AM		PM	
			ENTER	EXIT	ENTER	EXIT
Multifamily-low (220)	248 DU	1,836	26	87	84	49
Internal Capture Trips			2	7	1	4
Multifamily-mid (221)	270 DU	1,470	24	67	70	45
Internal Capture Trips			1	6	1	4
Hotel (310)	120 Rooms	928	32	23	33	31
Internal Capture Trips			1	2	3	3
Medical Office (720)	20,000 SF	696	44	12	19	50
Internal Capture Trips			4	1	1	0
Shopping Center (820)	10,000 SF	1,258	97	60	48	51
Internal Capture Trips			9	6	4	5
Passy-By Trips			-	-	16	16
Sit-Down Restaurant (932)	6,000 SF	674	48	36	54	50
Internal Capture Trips			4	3	5	5
Pass-By Trips			-	-	21	21
Total Trips		6,862	271	285	308	276
Total Internal Capture Trips		-	21	25	15	21
Total Pass-By Trips		-	-	-	23	23
Total New External Trips		6,862	250	260	256	218

4.1.2. Trip Distribution and Assignment

The trip distribution percentages were developed based on existing traffic patterns, location of employment centers, and engineering judgment. Figure 5 illustrates the phase 1 primary site trip distribution percentages. These trip distribution percentages were applied to the total new trip generation data in Table 2 to calculate the Phase 1 site trip assignments shown in Figure 6.

The full build primary site trip distribution percentages are shown in Figure 7. These trip distribution percentages were applied to the total new trip generation data in Table 3 to calculate the primary site trip assignments shown in Figure 8. Figure 9 illustrates the pass-by trip distribution percentages. These percentages were applied the total pass-by trips in Table 3 to calculate to pass-by trip assignments shown in Figure 10. Adding the primary and pass-by trip assignments (Figures 8 and 10) results in the full build out total trip assignment shown in Figure 11.

5. TRAFFIC ANALYSIS

5.1. Traffic Analysis Scenarios

Several scenarios were analyzed using traffic analysis software, Synchro 9.2. Traffic operations during the AM and PM peak hours were modeled for each scenario. The results of each scenario were compared in order to determine impacts from background traffic growth and the proposed development. The following scenarios were modeled:

- 2018 Existing
- 2020 No-Build
- 2020 Phase 1
- 2020 Build
- 2040 No-Build
- 2040 Build

The 2018 Existing scenario included the traffic characteristics that currently exist in the study area. Existing peak hour traffic volumes were used from the intersection counts (Figure 4). Existing signal timing data was obtained from NCDOT and referenced in all traffic models. Refer to Appendix C for the signal timing data. Congestion Management guidelines recommend a

minimum cycle length of 120 seconds for signals with four or more phases. No changes to the existing lane configurations were made. Right turns on red were prohibited.

The 2020 No-Build scenario was analyzed to determine the expected future traffic operations. Existing peak hour traffic counts were projected to the year 2020 using a compounded growth rate of 1% per year. Refer to Figure 12 for the 2020 projected peak hour traffic volumes. These volumes represent the 2020 No-Build peak hour traffic volumes. The splits at the signalized intersections were optimized. The lane configuration were not changed. Right turns on red were prohibited. Congestion Management guidelines recommend all signalized left turn movements be modeled with protected only phasing. However, with the build out of the site being only 1 year away, no changes to the existing left turn phases were made.

The 2020 Phase 1 scenario was compared to the 2020 No-Build scenario to determine expected impacts caused by the proposed site. This scenario included the same assumptions as the 2020 No-Build scenario. The trips expected to be generated by Phase 1 of the proposed development (Figure 6) were added to the 2020 No-Build peak hour volumes (Figure 12) to determine the 2020 Phase 1 peak hour traffic volumes. The traffic volumes entering/exiting Boyd Funderburk Road were removed and the intersection was changed from full access to a directional crossover. Figure 13 illustrates the traffic volume adjustments that were made. Refer to Figure 14 for the 2020 Phase 1 peak hour traffic volumes. The splits at the signalized intersections were optimized. Boyd Funderburk Drive was assumed to be abandoned therefore all entering and exiting trips were removed from the network. Right turns on red were prohibited. Congestion Management guidelines recommend all signalized left turn movements be modeled with protected only phasing. However, with the build out of the site being only 1 year away, no changes to the existing left turn phases were made.

The 2020 Build scenario was compared to the 2020 No-Build scenario to determine expected impacts caused by the proposed site. This scenario included the same assumptions as the 2020 No-Build scenario. The trips expected to be generated by full build out of the proposed development (Figure 11) were added to the 2020 No-Build peak hour volumes (Figure 12) to determine the 2020 Build peak hour traffic volumes. The traffic volumes entering/exiting Boyd Funderburk

Road were removed and the intersection was changed from full access to a directional crossover. Figure 13 illustrates the traffic volume adjustments that were made. Refer to Figure 15 for the 2020 Build peak hour traffic volumes. The splits at the signalized intersections were optimized. Boyd Funderburk Drive was replaced with Site Access A and the intersection was modeled as a directional crossover. Right turns on red were prohibited. Congestion Management guidelines recommend all signalized left turn movements be modeled with protected only phasing. However, with the build out of the site being only 1 year away, no changes to the existing left turn phases were made.

The 2040 No-Build scenario was developed to analyze traffic operations of the U-4913 design year. The draft U-4913 capacity analysis report dated August 2018 was referenced. Based on coordination with NCDOT no preferred alternative for U-4913 had been identified at the time of this TIS. For purposes of this TIS, it was assumed U-4913 would widen Idlewild Road to a 6-lane facility with traditional intersection designs. The I-485 interchange was assumed to be a Diverging Diamond Interchange. Peak hour traffic volumes for this scenario were taken directly from Figures 13 and 14 of the draft U-4913 capacity analysis report. These figures consisted of the U-4913 traffic forecast volumes plus 50% of a small area plan trip generation. Lane configurations were taken directly from Figures 17 and 18 of the draft U-4913 capacity analysis report. See Appendix D for excerpts from the draft U-4913 capacity analysis report. The draft U-4913 capacity analysis report did not include the intersection of Idlewild Road and Stallings Road. Peak hour traffic volumes were developed for this intersection using the same methodology as the draft U-4913 capacity analysis report. NCDOT indicated U-4913 would construct a roundabout at the intersection of Idlewild Road and Stallings Road. Appendix D includes additional information for this intersection. See Figure 16 of this TIS for the 2040 No-Build peak hour traffic volumes.

The 2040 Build scenario was developed to analyze traffic operations of the U-4913 design year with trips from the proposed development included. The original TIS scope, approved by NCDOT, did not include this analysis. The purpose of this analysis was to confirm a left-over access would operate at acceptable levels of service at Access A, and to confirm U-4913 would include this left-over access. Combining the 2040 No-Build peak hour volumes (Figure 16) with the proposed site trips (Figure 11) results in the 2040 Build peak hour traffic volumes shown in

Figure 17. The 2040 Build scenario included the same lane configuration assumptions as the 2040 No-Build scenario.

5.2. Traffic Analysis Procedure

All study intersections (both unsignalized and signalized) were analyzed using the methodology outlined in the Highway Capacity Manual (HCM) published by the Transportation Research Board. A computer software package, Synchro and SimTraffic (Version 9.2), was used to complete the analyses for all the study area intersections. Synchro was developed by Trafficware Corporation and allows the user to input data into the Synchro software and calculate the output based on methodologies in the HCM. SimTraffic creates a traffic simulation model from the Synchro inputs. SimTraffic was used in this study to determine expected queue lengths.

Analysis results for signalized intersections provide delay and level of service (LOS) for all movements and approaches. The overall intersection delay and LOS is also provided. The capacity analysis for an unsignalized intersection does not provide an overall LOS for the intersection, rather a LOS for movements and/or approaches that have a conflicting movement.

The HCM defines capacity as "the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions". LOS is a term used to represent different driving conditions, and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". LOS varies from Level "A" representing free flow, to Level "F" where greater vehicle delays are evident.

Refer to Table 4 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes "initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay". As shown in Table 4, an average control delay of 40 seconds at a signalized intersection results in a LOS D.

TABLE 4
HIGHWAY CAPACITY MANUAL - LEVELS OF SERVICE AND DELAY

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

5.3. Mitigation Requirements

NCDOT has guidelines for determining when improvements are needed by the developer. The District Engineer is responsible for the final determination of the improvements. NCDOT typically requires mitigation to be identified when developments are expected to impact the traffic operations as described below:

- Overall intersection or intersection approach delay increases by 25% or more.
- LOS degrades by at least one level
- LOS is F
- Synchro 95th or SimTraffic maximum queue results are greater than the existing turn lane storage length

5.4. Capacity and Level of Service at Study Intersections

5.4.1. Idlewild Road and Matthews-Mint Hill Road

The intersection of Idlewild Road and Matthews-Mint Hill Road was analyzed as a four-leg roundabout with existing lane configurations. Table 5 summarizes the capacity analysis results. Refer to Appendix E for the SIDRA reports for this intersection. Impacts requiring mitigation are highlighted in yellow. The intersection was not modeled in Synchro because it is not expected to affect the remainder of the study intersections.

The westbound and southbound approaches are expected to operate at LOS F during the AM peak hour of the 2020 No-Build scenario. These approaches would continue operating at LOS F during both Build scenarios, with increased delay. The development is expected to impact the eastbound and northbound approaches during the PM peak hour, along with the overall intersection. Much of the high delay at the intersection is caused by the No-Build traffic volumes. Changing the existing through/right lane to an exclusive through lane and adding an exclusive right turn lane to both the northbound and southbound approaches was considered, but is not expected to fully address delay issues in the No-Build and Build scenarios. The existing land development near the intersection would make construction of any additional lanes difficult. No improvements are recommended by the developer due to the right-of-way constraints, and the fact that much of the delay is caused by the No-Build traffic volumes.

TABLE 5
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND MATTHEWS-MINT HILL ROAD

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB	1 LT-TH, 1 RT	B (11.0)	E (41.2)	C (16.5)	C (20.3)
	WB	1 LT-TH, 1 RT	F (58.5)		B (13.3)	
	NB	1 LT-TH, 1 TH-RT	A (8.7)		E (35.5)	
	SB	1 LT-TH, 1 TH-RT	F (58.1)		B (10.4)	
2020 No-Build	EB	1 LT-TH, 1 RT	B (11.1)	E (45.1)	C (19.2)	C (24.0)
	WB	1 LT-TH, 1 RT	F (67.6)		B (14.2)	
	NB	1 LT-TH, 1 TH-RT	A (8.7)		E (44.3)	
	SB	1 LT-TH, 1 TH-RT	F (60.1)		B (10.8)	
2020 Build Phase 1	EB	1 LT-TH, 1 RT	B (11.2)	E (49.1)	C (24.2)	D (29.5)
	WB	1 LT-TH, 1 RT	F (77.5)		C (15.1)	
	NB	1 LT-TH, 1 TH-RT	A (8.7)		F (57.6)	
	SB	1 LT-TH, 1 TH-RT	F (60.9)		B (11.3)	
2020 Build	EB	1 LT-TH, 1 RT	B (11.8)	F (55.4)	D (34.5)	E (35.1)
	WB	1 LT-TH, 1 RT	F (93.4)		C (16.2)	
	NB	1 LT-TH, 1 TH-RT	A (9.1)		F (67.6)	
	SB	1 LT-TH, 1 TH-RT	F (62.7)		B (12.2)	

5.4.2. Idlewild Road and Stallings Road

The intersection of Idlewild Road and Stallings Road was analyzed as a three-leg unsignalized intersection with existing lane configurations. Table 6 summarizes the capacity analysis results. Refer to Appendix F for the Synchro reports for this intersection. Impacts requiring mitigation are highlighted in yellow. All SimTraffic reports can be found in Appendix N.

The main issue at this intersection is the amount of traffic on Idlewild Road. The high through traffic volumes result in few gaps in traffic; preventing vehicles to turn onto Idlewild Road from Stallings Road. SimTraffic indicates long queues could be expected on Stallings Road. The delay values on Stallings Road re higher than the limit that Synchro will report. The proposed development is not expected to impact the left turn movement from westbound Idlewild Road. Adding a right turn lane on Stallings could improve delay, but would not affect the lack of gaps in traffic on Idlewild Road.

A roundabout is being considered for this intersection as part of U-4913. A roundabout may improve the traffic operations, but is not recommended to be done by the developer. Much of the delay at the intersection is due to existing traffic.

Analysis of the proposed roundabout was performed based on information from the draft U-4913 capacity analysis report dated August 2018. Peak hour traffic volumes were determined starting with the traffic forecasts for 2017 Build and 2040 Build scenarios. Then 50% of the small area plan trip generation was added to the intersection; assuming 20% to/from the west on Idlewild, and 5% to/from Stallings Road. Lastly, the trip generation from the proposed site was added to the intersection. Development of the peak hour traffic volumes for this intersection can be found in Appendix D.

A flow scale analysis is typically performed for roundabouts to determine in which year a v/c of 0.85 would be reached. Based on the 2017 SIDRA analysis the westbound through movement would have a v/c ratio of 0.85 or higher in the first year. Therefore, a flow scale analysis was not performed. The draft U-4913 capacity analysis report came to the same result; the roundabout would fail at opening. It should be noted however, that the volumes used in this analysis included

50% of the small area plan trip generation. In reality, much of the small area plan trips would occur in future years as development occurs.

TABLE 6
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND STALLINGS ROAD

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB WB[1] NB[2]	1 TH-RT 1 LT, 1 TH 1 LT-RT	- B (11.1) F (Err)	NA[3]	- B (13.0) F (Err)	NA[3]
2020 No-Build	EB WB[1] NB[2]	1 TH-RT 1 LT, 1 TH 1 LT-RT	- B (11.3) F (Err)	NA[3]	- B (13.3) F (Err)	NA[3]
2020 Build Phase 1	EB WB[1] NB[2]	1 TH-RT 1 LT, 1 TH 1 LT-RT	- B (11.3) F (Err)	NA[3]	- B (13.7) F (Err)	NA[3]
2020 Build	EB WB[1] NB[2]	1 TH-RT 1 LT, 1 TH 1 LT-RT	- B (11.9) F (Err)	NA[3]	- B(14.2) F (Err)	NA[3]
2040 Build	EB WB NB	1 TH, 1 TH-RT 1 LT-TH, 1 TH 1 LT, 1 RT	F (86.2) A (3.3) D (28.1)	E (36.7)	F (167.1) A (2.9) E (41.2)	F (77.5)

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

5.4.3. Idlewild Road and I-485 Southbound Ramps

The intersection of Idlewild Road and I-485 Southbound Ramps was analyzed as a three-leg signalized intersection with existing lane configurations. Table 7 summarizes the capacity analysis results. Refer to Appendix G for the Synchro reports for this intersection. Impacts requiring mitigation are highlighted in yellow. All SimTraffic reports can be found in Appendix N.

The proposed development is expected to degrade the LOS on the westbound approach and for the overall intersection during the AM peak hour. However, only minor increases in delay are expected. SimTraffic indicates similar queues could expected between the No-Build and Build scenarios. Due to the technical, but minimal impacts, no improvements are recommended to be done by the developer.

Analysis of the 2040 Build scenario indicated no changes to the U-4913 design would be needed. The intersection would function at acceptable levels of service with no queue issues.

TABLE 7
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND I-485 SOUTHBOUND RAMPS

ANALYSIS SCENARIO	NODE	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
				Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	3	EB WB SB	2 TH, 1 RT 1 LT, 2 TH 1 LT-TH, 1 RT	D (38.5) B (17.4) D (48.7)	C (31.1)	C (25.2) B (18.6) D (54.0)	C (29.4)
2020 No-Build	3	EB WB SB	2 TH, 1 RT 1 LT, 2 TH 1 LT-TH, 1 RT	D (43.1) B (19.4) D (44.8)	C (32.2)	C (29.5) C (20.4) D (49.9)	C (30.8)
2020 Build Phase 1	3	EB WB SB	2 TH, 1 RT 1 LT, 2 TH 1 LT-TH, 1 RT	D (43.2) B (19.5) D (47.0)	C (32.7)	C (29.5) B (19.9) D (52.5)	C (31.3)
2020 Build	3	EB WB SB	2 TH, 1 RT 1 LT, 2 TH 1 LT-TH, 1 RT	D (45.8) C (22.1) D (49.6)	D (35.3)	C (32.4) B (18.0) D (54.4)	C (32.0)
2040 Build	3	WB SB	2 TH 1 RT	A (3.4) C (24.4)	A (6.3)	A (6.3) B (19.4)	A (7.8)
	33	EB NB	2 TH 2 TH	C (34.8) C (30.0)	C (32.2)	D (37.3) D (48.1)	D (42.1)
	333	EB SB	2 TH 2 LT	A (4.2) C (20.3)	B (10.3)	A (4.7) C (34.1)	B (14.9)

5.4.4. Idlewild Road and I-485 Northbound Ramps

The intersection of Idlewild Road and I-485 Northbound Ramps was analyzed as a three-leg signalized intersection with existing lane configurations. Table 8 summarizes the capacity analysis results. Refer to Appendix H for the Synchro reports for this intersection. Impacts requiring mitigation are highlighted in yellow. All SimTraffic reports can be found in Appendix N.

The proposed development is expected to impact the level of service on the northbound approach during the AM peak hour and the westbound approach delay during the PM peak hour. The overall intersection LOS is also expected to be impacted during the PM peak hour. However, these impacts are minimal. SimTraffic indicated similar queues are expected between the No-Build and Build scenarios. Due to the technical, but minimal impacts, no improvements are recommended to be done by the developer.

Analysis of the 2040 Build scenario indicated the intersection would function at acceptable levels of service. During the PM peak hour the through movements on Idlewild Road would operate near capacity. SimTraffic indicated the westbound through movement is expected to spillback to the intersection of Idlewild Road and Marshall Hooks Road / Access A during both peak hours.

A 2040 No-Build scenario was analyzed to determine whether or not the proposed development would cause the spillback. This scenario included the same assumptions as the 2040 Build scenario, but removed the proposed site trips. The 2040 No-Build scenario still resulted in spillback to the intersection of Idlewild Road and Marshall Hooks Road / Access A. Spillback could be expected without the proposed site trips.

TABLE 8
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND I-485 NORTHBOUND RAMPS

ANALYSIS SCENARIO	NODE	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
				Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	4	EB WB NB	1 LT, 2 TH 2 TH, 1 RT 1 LT-TH, 2 RT	B (14.1) A (9.0) E (63.5)	B (17.7)	A (3.5) A (9.6) E (55.7)	B (19.5)
2020 No-Build	4	EB WB NB	1 LT, 2 TH 2 TH, 1 RT 1 LT-TH, 2 RT	B (11.6) B (11.3) D (53.6)	B (17.1)	A (3.9) B (16.6) D (45.8)	B (19.4)
2020 Build Phase 1	4	EB WB NB	1 LT, 2 TH 2 TH, 1 RT 1 LT-TH, 2 RT	B (10.3) B (11.6) D (54.9)	B (17.0)	A (3.9) B (11.1) D (45.4)	B (17.4)
2020 Build	4	EB WB NB	1 LT, 2 TH 2 TH, 1 RT 1 LT-TH, 2 RT	A (9.7) B (12.6) E (55.7)	B (17.8)	A (8.5) B (17.2) D (44.9)	C (21.0)
2040 Build	4	WB NB	3 TH 1 LT	A (4.2) C (24.9)	A (5.6)	A (6.1) C (22.9)	A (7.2)
	44	WB SB	3 TH 3 TH	B (17.3) D (38.9)	C (26.6)	D (38.1) D (45.8)	D (42.0)
	444	EB NB	3 TH 3 RT	A (4.2) B (19.8)	A (9.4)	A (6.2) C (33.3)	B (15.7)

5.4.5. Idlewild Road and Marshall Hooks Road / Access A

The intersection of Idlewild Road and Marshall Hooks Road / Access A was analyzed as a three-leg unsignalized intersection with full access during the Existing and No-Build scenarios. Table 9 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix I for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix N.

During the 2020 Build Phase 1 scenario it was assumed Boyd Funderburk Road (future Access A location) would be abandoned. During the 2020 Full Build scenario Access A would become the northbound approach. The proposed development would also change this intersection from full access to a directional crossover (right-in, right-out, left-in). The No-Build traffic volumes entering and exiting Boyd Funderburk Road were removed from the network during the 2020 Build Phase 1, and 2020 Build scenarios. No improvements are recommended for the 2020 Build Phase 1 scenario.

Based on turn lane warrants, an eastbound right turn lane is recommended for the 2020 Build scenario. See Appendix I for the turn lane warrant analysis. It is recommended the developer make the following improvements when Access A is constructed:

- Construct Access A with one ingress lane and one egress lane (right only).
- Construct a concrete median to restrict access to right-in, right-out, left-in on both sides of Idlewild Road.
- Extend the westbound Idlewild Road left turn lane to provide 125 feet of storage and appropriate taper.
- Construct an eastbound Idlewild Road right turn lane with 100 feet of storage and appropriate taper.

NCDOT requested analysis of the 2040 Build scenario in order to determine if Access A would have a left-over access as part of U-4913. Analysis of the 2040 Build scenario indicated the overall intersection would function at acceptable levels of service. During the PM peak hour the northbound approach is expected to operate at LOS E with a maximum queue of approximately 170 feet. SimTraffic indicated the westbound and southbound approaches could experience long

queues during the PM peak hour due to spillback from the I-485 interchange. It was noted in section 5.4.4 of this TIS that the spillback could be expected without the proposed site trips. While there are expected to be some queue issues at this intersection, the left turn movement onto Access A is expected to function with no issues.

TABLE 9
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND MARSHALL HOOKS ROAD / ACCESS A

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB[1] WB[1] NB[2] SB[2]	1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	B (12.9) A (8.7) C (18.4) C (25.8)	NA[3]	B (10.4) B (12.7) C (24.5) C (21.2)	NA[3]
2020 No-Build	EB[1] WB[1] NB[2] SB[2]	1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	B (13.1) A (8.7) C (18.6) D (26.5)	NA[3]	B (10.5) B (12.9) C (24.8) C (21.6)	NA[3]
2020 Build Phase 1	EB[1] WB[1] SB[2]	1 LT, 2 TH 1 TH, 1 TH-RT 1 LT-RT	B (13.7) - C (22.8)	NA[3]	B (10.7) - B (16.3)	NA[3]
2020 Build	EB[1] WB[1] NB[2] SB[2]	1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 RT 1 RT	B (14.5) A (9.7) B (10.8) C (16.7)	NA[3]	B (11.3) C (17.3) B (13.4) B (13.2)	NA[3]
2020 Build With Improvements	EB[1] WB[1] NB[2] SB[2]	1 LT, 2 TH, **1 RT** 1 LT, 1 TH, 1 TH-RT 1 RT 1 RT	B (14.5) A (9.8) B (10.4) C (16.7)	NA[3]	B (11.3) C (17.3) B (12.4) B (13.2)	NA[3]
2040 Build	EB[1] WB[1] NB[2] SB[2]	1 LT, 2 TH, 1 TH-RT 1 LT, 2 TH, 1 TH-RT 1 RT 1 RT	A (4.6) A (4.5) D (54.9) C (21.8)	A (5.1)	A (4.0) A (3.4) E (60.1) D (52.3)	A (4.9)

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections.

5.4.6. Idlewild Road and Rite Aid Driveway

The intersection of Idlewild Road and Rite Aid Driveway was analyzed as a three-leg signalized intersection. Table 10 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix J for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix N.

The proposed development is expected to impact multiple approaches during both peak hours. Much of this impact is due to the number of vehicles entering and exiting the site via the Rite Aid Driveway. It is recommended the developer construct the following improvements:

Phase 1 Improvements:

- Construct a northbound right turn lane on the Rite Aid Driveway with 300 feet of storage and appropriate taper.
- Modify the signal as necessary.

Full Build Improvements:

- Extend the northbound right turn lane on the Rite Aid Driveway to provide 500 feet of storage and appropriate taper.

These improvements are expected to mitigate much of the delay caused by the development. Some impacts would remain, but some approaches would be improved to better than the No-Build scenario. Construction of lanes in addition to what has been recommended would require additional departure lanes and are therefore not recommended.

Analysis of the 2040 Build scenario indicated the overall intersection would function at acceptable levels of service. The northbound approach is expected to operate at LOS F during both peak hours. SimTraffic indicated several turn lanes would need additional storage length than what was assumed in the U-4913 design. Appendix J includes a 2040 Build with Improvements scenario with the additional storage lengths. The following improvements to the U-4913 design would be needed:

- Provide 400 feet of storage on each of the northbound Rite Aid Driveway dual left turn lanes.
- Provide 300 feet of storage on the northbound Rite Aid Driveway right turn lane.

TABLE 10
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND RITE AID DRIVEWAY

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT-RT	A (2.7) A (6.5) F (81.5)	A (8.1)	D (42.0) B (13.9) F (88.9)	D (36.9)
2020 No-Build	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT-RT	A (3.9) B (10.7) E (69.1)	B (11.0)	D (51.2) B (10.9) F (103.4)	D (41.8)
2020 Build Phase 1	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT-RT	A (4.4) A (10.0) F (84.8)	B (15.2)	E (66.0) C (27.7) F (112.4)	E (58.0)
2020 Build Phase 1 with Improvements	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT, **1 RT**	A (4.2) A (8.0) E (69.1)	B (12.4)	C (23.7) B (13.3) E (59.9)	C (25.3)
2020 Build	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT-RT	A (7.4) D (38.3) F (115.0)	D (40.4)	F (115.8) C (25.7) F (151.8)	F (87.2)
2020 Build With Improvements	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT, **1 RT**	A (4.0) B (11.4) F (103.3)	C (21.3)	C (33.0) B (15.8) F (80.4)	D (35.5)
2040 Build	EB WB NB SB	2 LT, 2 TH, 1 TH-RT 1 LT, 2 TH, 1 TH-RT 2 LT, 1 TH, 1 RT 2 LT, 1 TH, 1 RT	B (10.7) A (9.8) F (82.2) D (53.3)	B (15.8)	C (27.6) B (12.1) F (92.5) E (69.0)	C (30.1)

5.4.7. Idlewild Road and Stevens Mill Road

The intersection of Idlewild Road and Steven Mills Road was analyzed as a four-leg signalized intersection. Table 11 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix K for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix N.

The northbound and southbound approaches are expected to operate at LOS F during the AM peak hour of the 2020 No-Build scenario. The southbound approach is expected to operate at LOS E during the PM peak hour of the 2020 No-Build scenario. Much of the delay at this intersection is expected to be caused by the lack of capacity on the Idlewild Road through movements. This lack of capacity should be greatly improved by U-4913.

Capacity issues are expected to remain at the intersection in the 2020 Build Phase 1 scenario. An increase in delay on the eastbound approach is expected during the AM peak hour. Construction of a northbound Stevens Mill Road right turn lane would provide additional capacity. This improvement would decrease the overall intersection delay to less than the 2020 No-Build values, but some technical impacts would remain. The northbound right turn lane would need 175 feet of storage.

Additional impacts are expected during the 2020 Build scenario. Construction of the northbound right turn lane would improve traffic operations, but some impacts to LOS and delay would remain. The overall intersection delay would be less than the 2020 No-Build delay during the PM peak hour.

Significant improvements to this intersection are expected as part of U-4913. This project would provide the needed capacity on the Idlewild Road through movements. Consideration should be given to the amount of improvements to be done by the developer at this intersection due to the expected capacity issues without the proposed site trips and the future improvements being planned. Payment in lieu of roadway improvements by the developer should be considered as well.

Analysis of the 2040 Build scenario indicated the overall intersection would function at acceptable levels of service. The northbound and southbound approaches are expected to operate at LOS F in the 2040 Build scenario. SimTraffic indicated several turn lanes would need additional capacity and storage length than what was assumed in the U-4913 design. Appendix K includes a 2040 Build with Improvements scenario with the additional capacity and storage lengths. The following improvements to the U-4913 design would be needed:

- Provide 425 feet of storage on the westbound Idlewild Road left turn lane.
- Construct dual left turn lanes instead of a single left turn lane on northbound Stevens Mill Road. The dual left turn lanes would need 225 feet of storage on each lane.

TABLE 11
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND STEVENS MILL ROAD

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B (10.2) D (43.8) F (102.6) E (68.7)	D (47.9)	D (42.3) D (35.5) E (73.7) D (45.2)	D (44.1)
2020 No-Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	A (7.8) D (53.5) F (107.8) F (91.8)	E (57.6)	D (53.3) D (43.2) E (76.0) D (44.5)	D (51.6)
2020 Build Phase 1	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	C (24.4) D (54.4) F (107.1) F (92.8)	E (61.3)	D (49.8) D (46.6) F (84.0) D (45.6)	D (52.2)
2020 Build Phase 1 with Improvements	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, **1 RT** 1 LT, 1 TH, 1 RT	B (19.3) D (54.4) D (53.5) F (91.9)	D (54.7)	D (42.9) C (33.1) E (60.7) E (57.5)	D (43.7)
2020 Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B (19.1) E (67.1) F (125.7) F (110.6)	E (71.0)	E (67.5) D (49.2) F (93.4) D (47.5)	E (62.3)
2020 Build with Improvements	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, **1 RT** 1 LT, 1 TH, 1 RT	C (23.8) E (67.1) E (58.1) F (109.9)	E (65.2)	E (61.1) C (29.0) E (61.3) E (63.7)	D (51.4)
2040 Build	EB WB NB SB	2 LT, 3 TH, 1 RT 1 LT, 3 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	D (36.7) C (33.1) E (69.7) F (82.2)	D (43.7)	D (44.7) D (40.7) F (83.5) F (86.9)	D (51.5)
2040 Build With Improvements	EB WB NB SB	2 LT, 3 TH, 1 RT 1 LT, 3 TH, 1 RT **2 LT**, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	C (30.3) C (31.7) E (69.4) E (67.1)	D (38.8)	D (44.6) D (39.9) E (61.4) E (69.7)	D (47.2)

5.4.8. Idlewild Road and Crismark Drive

The intersection of Idlewild Road and Crismark Drive was analyzed as a three-leg unsignalized intersection. Table 12 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix L for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix N.

The southbound stop controlled approach is expected to operate at LOS F during both peak hour of the 2020 No-Build scenario. This delay is mainly caused by the lack of gaps in traffic on westbound Idlewild Road versus the southbound right turn movement. The southbound left turn movement is projected to have only 14 vehicles per hour in the 2020 No-Build scenario. Some spillback on westbound Idlewild Road could be expected from the Stevens Mill Road intersection. Construction of additional turn lanes would not provide the needed gaps in traffic on Idlewild Road. Existing road connectivity in the area would provide drivers with several different route alternatives. No improvements are recommended to be done by the developer.

TABLE 12
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND CRISMARK DRIVE

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB[1] WB SB[2]	1 LT, 1 TH 1 TH-RT 1 LT-RT	B (10.3) - F (67.5)	NA[3]	B (11.0) - E (46.0)	NA[3]
2020 No-Build	EB[1] WB SB[2]	1 LT, 1 TH 1 TH-RT 1 LT-RT	B (10.4) - F (76.6)	NA[3]	B (11.2) - F (50.6)	NA[3]
2020 Build Phase 1	EB[1] WB SB[2]	1 LT, 1 TH 1 TH-RT 1 LT-RT	B (10.4) - F (79.1)	NA[3]	B (11.3) - F (54.5)	NA[3]
2020 Build	EB[1] WB SB[2]	1 LT, 1 TH 1 TH-RT 1 LT-RT	B (10.7) - F (99.6)	NA[3]	B (11.6) - F (62.9)	NA[3]

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections.

5.4.9. Idlewild Road and Rockwell Drive

The intersection of Idlewild Road and Rockwell Drive was analyzed as a three-leg unsignalized intersection. Table 13 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix M for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix N.

The proposed development is not expected to impact the level of service and delay on the intersection during the AM peak hour. Impacts are expected to occur on the southbound approach during the PM peak hour. These impacts are minimal, and the approach is expected to operate at LOS D. Due to the technical, but minimal impacts, no improvements are recommended to be done by the developer.

TABLE 13
ANALYSIS SUMMARY OF
IDLEWILD ROAD AND ROCKWELL DRIVE

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2018 Existing	EB[1] WB SB[2]	1 LT-TH 1 TH-RT 1 LT-RT	A (0.3) - C (21.2)	NA[3]	A (3.3) - C (22.5)	NA[3]
2020 No-Build	EB[1] WB SB[2]	1 LT-TH 1 TH-RT 1 LT-RT	A (0.3) - C (22.0)	NA[3]	A (3.5) - C (23.2)	NA[3]
2020 Build Phase 1	EB[1] WB SB[2]	1 LT-TH 1 TH-RT 1 LT-RT	A (0.3) - C (22.2)	NA[3]	A (3.6) - C (24.0)	NA[3]
2020 Build	EB[1] WB SB[2]	1 LT-TH 1 TH-RT 1 LT-RT	A (0.3) - C (24.1)	NA[3]	A (3.8) - D (25.6)	NA[3]

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections.

6. CONCLUSIONS

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the proposed Idlewild Road Mixed Use development to be located along Idlewild Road, east of I-485 in Matthews and Stallings, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development.

The site is proposed to be constructed in two phases. Phase 1 will consist of up to 127 multifamily low-rise homes, and 270 multifamily mid-rise homes. An additional 121 multifamily low-rise homes, a 120-room hotel, a 20,000 square foot medical office, 10,000 square feet of shopping center, and a 6,000 square foot sit-down restaurant will also be built in the 2020 Full Build scenario. The existing Rite Aid Driveway would provide access to Phase 1. One site access is expected to be built on Idlewild Road as a right-in / right-out with a left over. This access would be constructed after Phase 1. The site is expected to be fully built by the year 2020.

6.1. Summary of Recommended Improvements

Based on the analysis results, some impacts are expected by the proposed development. Figure 18 illustrates the improvements recommended to be completed by the developer as part of 2020 Build Phase 1. Figure 19 illustrates the improvements recommended to be completed by the developer as part of 2020 Build (full buildout of the site). Figure 20 illustrates the improvements recommended to the U-4913 design.

The following improvements are recommended to be done the developer:

Idlewild road and Matthews-Mint Hill Road

- No improvements are recommended.

Idlewild Road and Stallings Road

- No improvements are recommended.

Idlewild Road and I-485 Southbound Ramps

- No improvements are recommended.

Idlewild Road and I-485 Northbound Ramps

- No improvements are recommended.

Idlewild Road and Marshall Hooks Road / Access A

The following improvements should be implemented prior to Full Build construction:

- Construct Access A with one ingress lane and one egress lane (right only).
- Construct a concrete median to restrict access to right-in, right-out, left-in on both sides of Idlewild Road.
- Extend the westbound Idlewild Road left turn lane to provide 125 feet of storage and appropriate taper.
- Construct an eastbound Idlewild Road right turn lane with 100 feet of storage and appropriate taper.

Idlewild Road and Rite Aid Driveway

The following improvements should be implemented prior to Phase 1 construction:

- Construct a northbound right turn lane on the Rite Aid Driveway with 300 feet of storage and appropriate taper.
- Modify the signal as necessary.

The following improvements should be implemented prior to Full Build construction:

- Extend the northbound right turn lane on the Rite Aid Driveway to provide 500 feet of storage and appropriate taper.

Idlewild Road and Stevens Mill Road

The following improvements should be implemented prior to Phase 1 construction:

- Construct a northbound right turn lane on Stevens Mill Road with 175 feet of storage and appropriate taper.
- Modify the signal as necessary.

- Consideration should be given to the extent of improvements done by the developer due to the expected capacity issues without the proposed site trips and the future improvements planned as part of U-4913. Payment in lieu of roadway improvements by the developer should also be considered.

Idlewild Road and Crismark Drive

- No improvements are recommended.

Idlewild Road and Rockwell Drive

- No improvements are recommended.

The following improvements to the U-4913 design are recommended:

Idlewild road and Matthews-Mint Hill Road

- No improvements are recommended.

Idlewild Road and Stallings Road

- No improvements are recommended.

Idlewild Road and I-485 Southbound Ramps

- No improvements are recommended.

Idlewild Road and I-485 Northbound Ramps

- No improvements are recommended.

Idlewild Road and Marshall Hooks Road / Access A

- No improvements are recommended.

Idlewild Road and Rite Aid Driveway

- Provide 400 feet of storage on each of the northbound Rite Aid Driveway dual left turn lanes.
- Provide 300 feet of storage on the northbound Rite Aid Driveway right turn lane.

Idlewild Road and Stevens Mill Road

- Provide 425 feet of storage on the westbound Idlewild Road left turn lane.
- Construct dual left turn lanes instead of a single left turn lane on northbound Stevens Mill Road. The dual left turn lanes would need 225 feet of storage on each lane.

Idlewild Road and Crismark Drive

- No improvements are recommended.

Idlewild Road and Rockwell Drive

- No improvements are recommended.

TECHNICAL APPENDIX

APPENDIX A

FIGURES

We Count because YOU Count

BSI
TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Matthews-Mint Hill) AM Peak
Site Code :
Start Date : 10/2/2018
Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Mathews-Mint Hill Road Southbound					Idlewild Road Westbound					Mathews-Mint Hill Road Northbound					Idlewild Road Eastbound					
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Int. Total
07:00	33	134	34	1	202	21	125	61	3	210	22	57	53	3	135	45	41	12	0	98	645
07:15	27	127	28	0	182	30	143	85	0	258	12	63	53	6	134	51	57	10	0	118	692
07:30	52	115	17	0	184	25	137	82	0	244	7	62	57	3	129	23	36	19	1	79	636
07:45	26	138	32	0	196	45	88	98	5	236	14	88	28	6	136	32	62	37	0	131	699
Total	138	514	111	1	764	121	493	326	8	948	55	270	191	18	534	151	196	78	1	426	2672
08:00	35	154	20	1	210	54	98	83	1	236	21	52	22	7	102	35	49	41	0	125	673
08:15	31	140	28	0	199	53	90	58	0	201	22	74	14	2	112	42	65	24	0	131	643
08:30	24	134	31	0	189	31	103	62	3	199	17	71	17	4	109	13	46	24	0	83	580
08:45	26	146	32	0	204	40	90	64	1	195	18	68	13	3	102	30	37	7	0	74	575
Total	116	574	111	1	802	178	381	267	5	831	78	265	66	16	425	120	197	96	0	413	2471
Grand Total	254	1088	222	2	1566	299	874	593	13	1779	133	535	257	34	959	271	393	174	1	839	5143
Apprch %	16.2	69.5	14.2	0.1		16.8	49.1	33.3	0.7		13.9	55.8	26.8	3.5		32.3	46.8	20.7	0.1		
Total %	4.9	21.2	4.3	0	30.4	5.8	17	11.5	0.3	34.6	2.6	10.4	5	0.7	18.6	5.3	7.6	3.4	0	16.3	
Cars +	252	1087	221	2	1562	297	872	592	13	1774	132	534	255	34	955	271	392	174	1	838	5129
% Cars +	99.2	99.9	99.5	100	99.7	99.3	99.8	99.8	100	99.7	99.2	99.8	99.2	100	99.6	100	99.7	100	100	99.9	99.7
Trucks	2	1	1	0	4	2	2	1	0	5	1	1	2	0	4	0	1	0	0	1	14
% Trucks	0.8	0.1	0.5	0	0.3	0.7	0.2	0.2	0	0.3	0.8	0.2	0.8	0	0.4	0	0.3	0	0	0.1	0.3

File Name : Matthews(Idlewild and Matthews-Mint Hill) AM Peak
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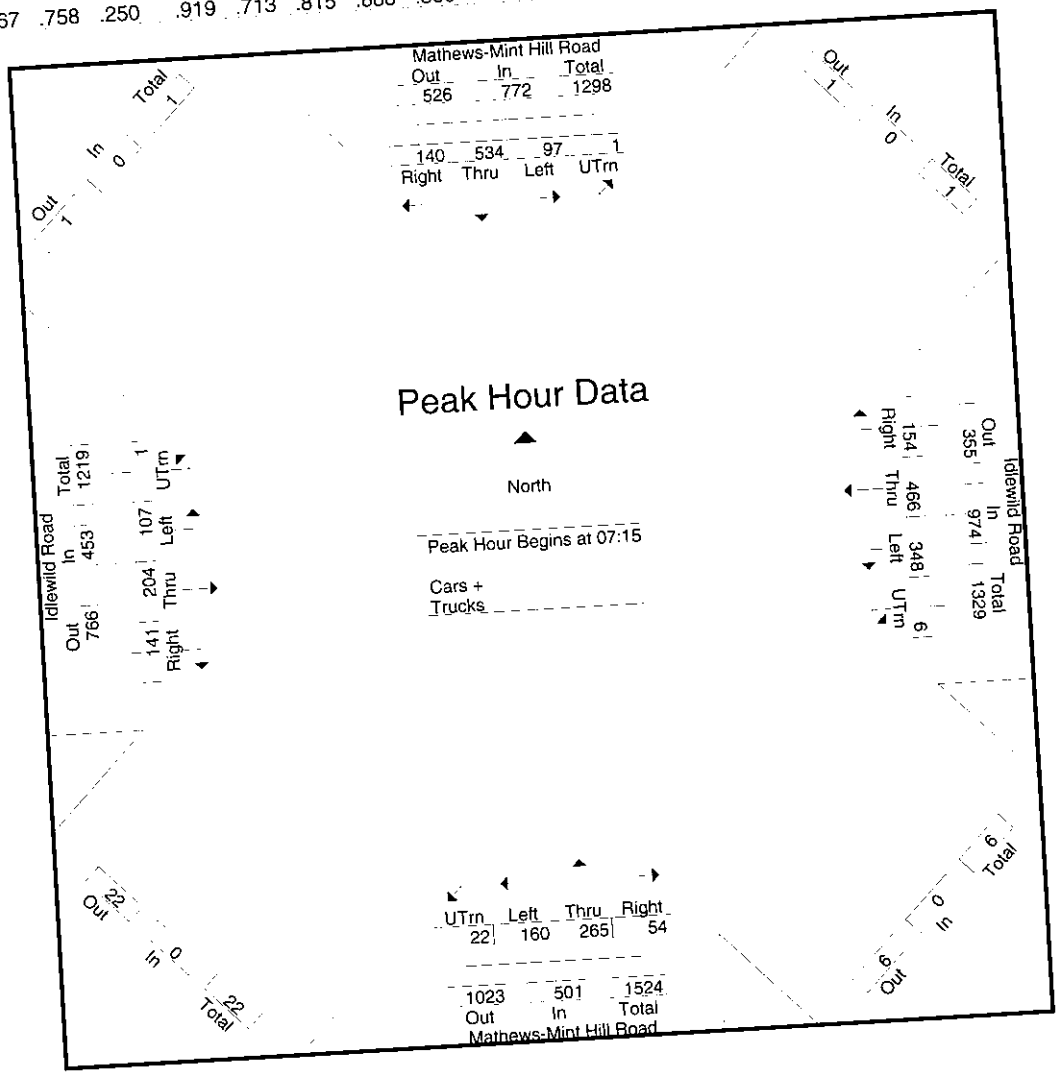
	Mathews-Mint Hill Road Southbound					Idlewild Road Westbound					Mathews-Mint Hill Road Northbound					Idlewild Road Eastbound				
Start Time	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 07:15																				
07:15	27	127	28	0	182	30	**143**	85	0	**258**	12	63	53	6	134	**51**	57	10	0	118	692
07:30	**52**	115	17	0	184	25	137	82	0	244	7	62	**57**	3	129	23	36	19	**1**	79	636
07:45	26	138	**32**	0	196	45	88	**98**	**5**	236	14	**88**	28	6	**136**	32	**62**	37	0	**131**	**699**
08:00	35	**154**	20	**1**	**210**	**54**	98	83	1	236	**21**	52	22	**7**	102	35	49	**41**	0	125	673
Total Volume	140	534	97	1	772	154	466	348	6	974	54	265	160	22	501	141	204	107	1	453	2700
% App. Total																					
PHF	.673	.867	.758	.250	.919	.713	.815	.888	.300	.944	.643	.753	.702	.786	.921	.691	.823	.652	.250	.865	.966



File Name : Matthews(Idlewild and Matthews-Mint Hill) PM Peak
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Groups Printed- Cars + - Trucks

Start Time	Idlewild Road Southbound					Matthews-Mint Hill Road Westbound					Idlewild Road Northbound					Matthews-Mint Hill Road Eastbound					
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Int. Total
16:00	27	109	46	1	183	49	49	29	1	128	50	147	24	5	226	21	83	23	1	128	665
16:15	19	114	40	2	175	46	50	33	2	131	60	161	25	3	249	31	108	14	0	153	708
16:30	22	105	60	0	187	58	55	32	4	149	50	156	16	0	222	20	108	15	0	143	701
16:45	21	108	49	0	178	48	46	41	3	138	49	164	29	1	243	22	122	27	0	171	730
Total	89	436	195	3	723	201	200	135	10	546	209	628	94	9	940	94	421	79	1	595	2804
17:00	27	133	66	1	227	52	57	32	1	142	52	173	26	1	252	19	101	19	1	140	761
17:15	18	128	45	2	193	53	76	40	0	169	45	162	35	1	243	34	129	27	0	190	795
17:30	29	136	46	3	214	47	57	41	3	148	56	181	26	1	264	19	110	23	0	152	778
17:45	25	132	57	1	215	53	64	32	1	150	49	163	22	2	236	27	106	27	0	160	761
Total	99	529	214	7	849	205	254	145	5	609	202	679	109	5	995	99	446	96	1	642	3095
Grand Total	188	965	409	10	1572	406	454	280	15	1155	411	1307	203	14	1935	193	867	175	2	1237	5899
Apprch %	12	61.4	26	0.6		35.2	39.3	24.2	1.3		21.2	67.5	10.5	0.7		15.6	70.1	14.1	0.2		
Total %	3.2	16.4	6.9	0.2	26.6	6.9	7.7	4.7	0.3	19.6	7	22.2	3.4	0.2	32.8	3.3	14.7	3	0	21	
Cars +	188	965	409	10	1572	406	454	280	15	1155	409	1303	203	14	1929	193	866	175	2	1236	5892
% Cars +	100	100	100	100	100	100	100	100	100	100	99.5	99.7	100	100	99.7	100	99.9	100	100	99.9	99.9
Trucks	0	0	0	0	0	0	0	0	0	0	2	4	0	0	6	0	1	0	0	1	7
% Trucks	0	0	0	0	0	0	0	0	0	0	0.5	0.3	0	0	0.3	0	0.1	0	0	0.1	0.1

TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Matthews-Mint Hill) PM Peak
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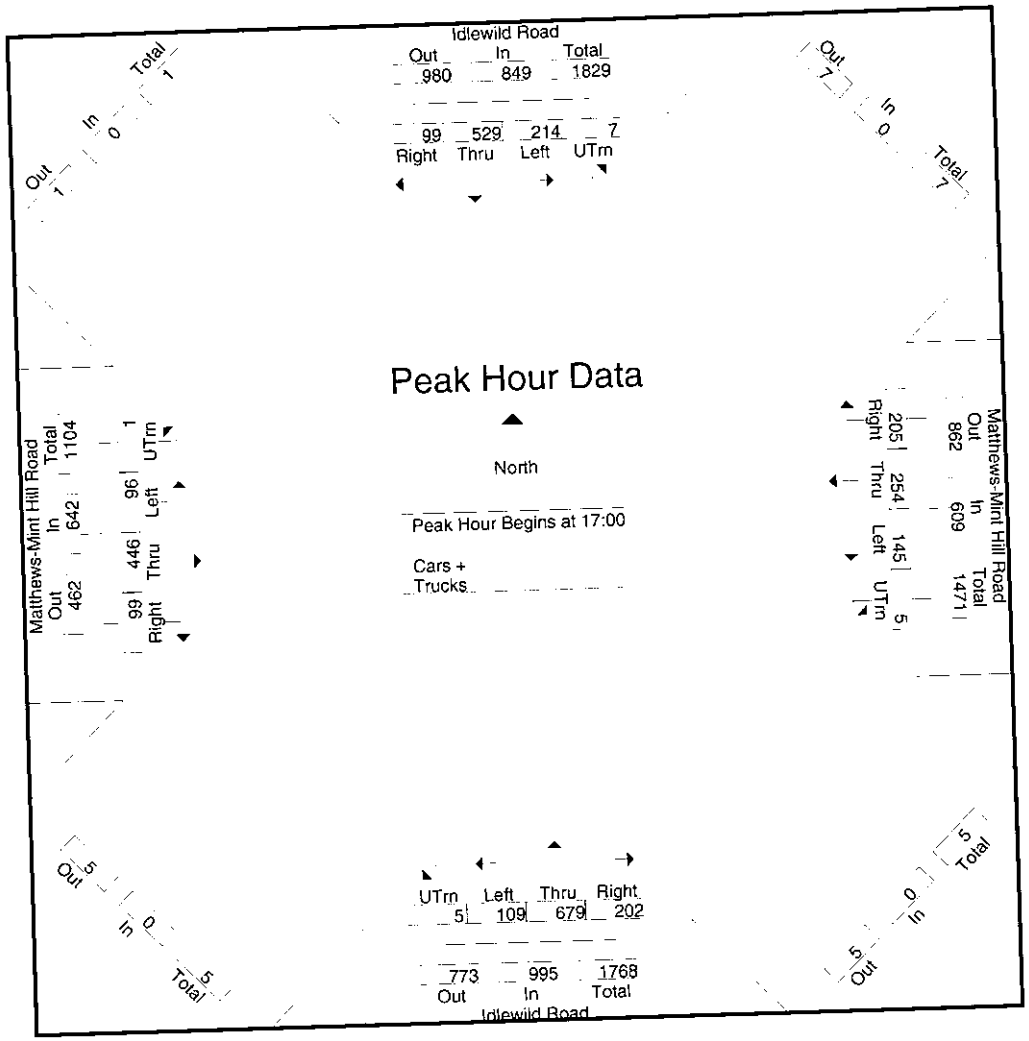
	Idlewild Road Southbound					Matthews-Mint Hill Road Westbound					Idlewild Road Northbound					Matthews-Mint Hill Road Eastbound					
Start Time	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	27	133	**66**	1	**227**	52	57	32	1	142	52	173	26	1	252	19	101	19	**1**	140	761
17:15	18	128	45	2	193	**53**	**76**	40	0	**169**	45	162	**35**	1	243	**34**	**129**	**27**	0	**190**	**795**
17:30	**29**	**136**	46	**3**	214	47	57	**41**	**3**	148	**56**	**181**	26	1	**264**	19	110	23	0	152	778
17:45	25	132	57	1	215	53	64	32	1	150	49	163	22	**2**	236	27	106	27	0	160	761
Total Volume	99	529	214	7	849	205	254	145	5	609	202	679	109	5	995	99	446	96	1	642	3095
% App. Total	11.7	62.3	25.2	0.8		33.7	41.7	23.8	0.8		20.3	68.2	11	0.5		15.4	69.5	15	0.2		
PHF	.853	.972	.811	.583	.935	.967	.836	.884	.417	.901	.902	.938	.779	.625	.942	.728	.864	.889	.250	.845	.973



BSI
TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Stallings) AM Peak
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Groups Printed- Cars + - Trucks

	Idlewild Road Southbound			Idlewild Road Northbound			Stallings Road Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
07:00	25	93	118	152	80	232	42	8	50	400
07:15	25	88	113	194	127	321	65	13	78	512
07:30	22	78	100	209	138	347	61	8	69	516
07:45	25	93	118	164	96	260	80	13	93	471
Total	97	352	449	719	441	1160	248	42	290	1899
08:00	24	86	110	161	70	231	44	16	60	401
08:15	16	106	122	186	81	267	25	18	43	432
08:30	11	79	90	154	51	205	27	8	35	330
08:45	14	78	92	155	48	203	31	11	42	337
Total	65	349	414	656	250	906	127	53	180	1500
Grand Total	162	701	863	1375	691	2066	375	95	470	3399
Apprch %	18.8	81.2		66.6	33.4		79.8	20.2		
Total %	4.8	20.6	25.4	40.5	20.3	60.8	11	2.8	13.8	
Cars +	162	698	860	1370	691	2061	375	95	470	3391
% Cars +	100	99.6	99.7	99.6	100	99.8	100	100	100	99.8
Trucks	0	3	3	5	0	5	0	0	0	8
% Trucks	0	0.4	0.3	0.4	0	0.2	0	0	0	0.2

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TRAFFIC DATA COLLECTION

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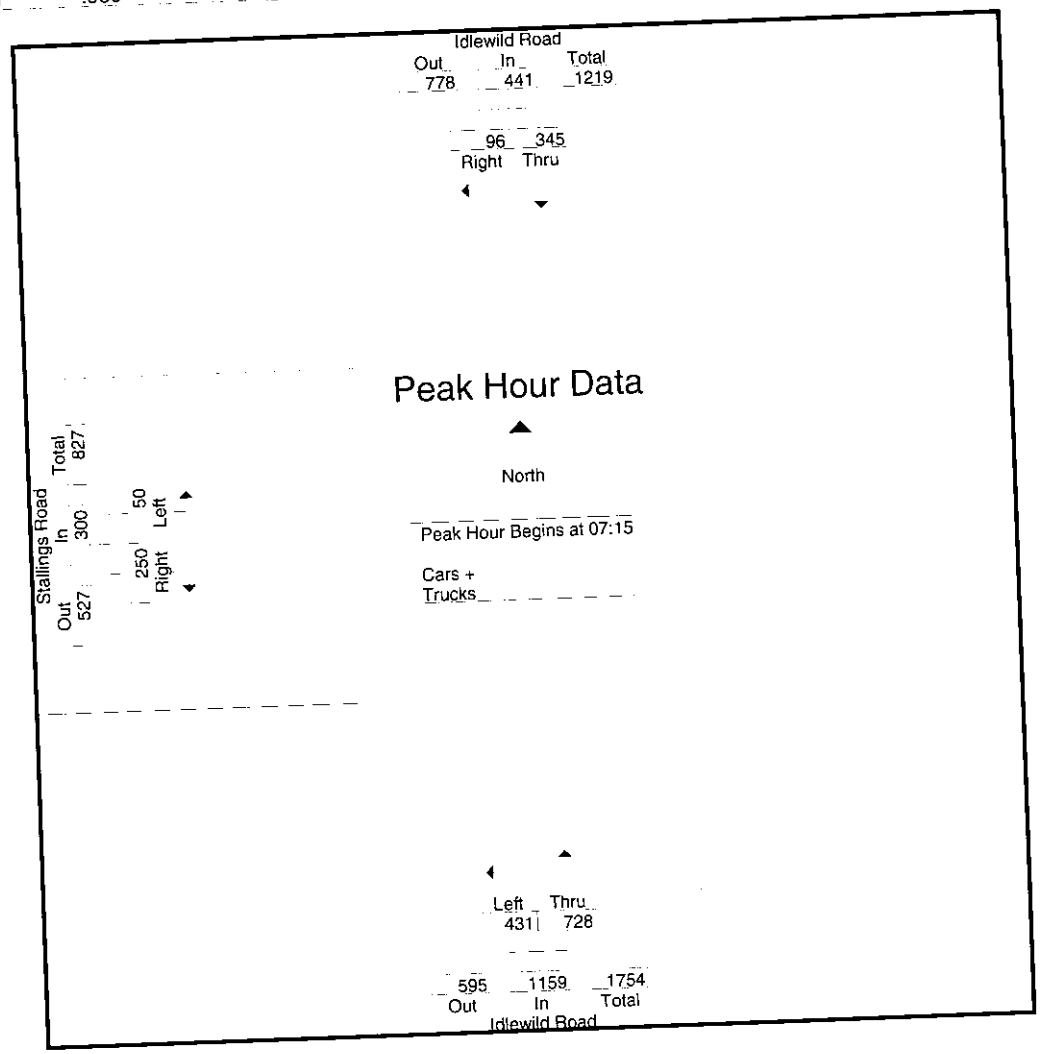
	Idlewild Road Southbound			Idlewild Road Northbound			Stallings Road Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15										
07:15	**25**	88	113	194	127	321	65	13	78	512
07:30	22	78	100	**209**	**138**	**347**	61	8	69	**516**
07:45	25	**93**	**118**	164	96	260	**80**	13	**93**	471
08:00	24	86	110	161	70	231	44	**16**	60	401
Total Volume	96	345	441	728	431	1159	250	50	300	1900
% App. Total	21.8	78.2		62.8	37.2		83.3	16.7		
PHF	.960	.927	.934	.871	.781	.835	.781	.781	.806	.921



BSI
TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Stallings) PM Peak
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Groups Printed- Cars + - Trucks

	Idlewild Road Southbound			Idlewild Road Northbound			Stallings Road Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
16:00	18	142	160	112	60	172	43	8	51	383
16:15	21	150	171	118	72	190	42	9	51	412
16:30	31	151	182	136	55	191	90	14	104	477
16:45	40	158	198	116	66	182	82	9	91	471
Total	110	601	711	482	253	735	257	40	297	1743
17:00	33	181	214	131	71	202	66	20	86	502
17:15	31	175	206	152	60	212	84	16	100	518
17:30	37	152	189	148	80	228	70	7	77	494
17:45	36	146	182	144	81	225	49	11	60	467
Total	137	654	791	575	292	867	269	54	323	1981
Grand Total	247	1255	1502	1057	545	1602	526	94	620	3724
Apprch %	16.4	83.6		66	34		84.8	15.2		
Total %	6.6	33.7	40.3	28.4	14.6	43	14.1	2.5	16.6	
Cars +	247	1255	1502	1057	545	1602	526	94	620	3724
% Cars +	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

BSI
TRAFFIC DATA COLLECTION

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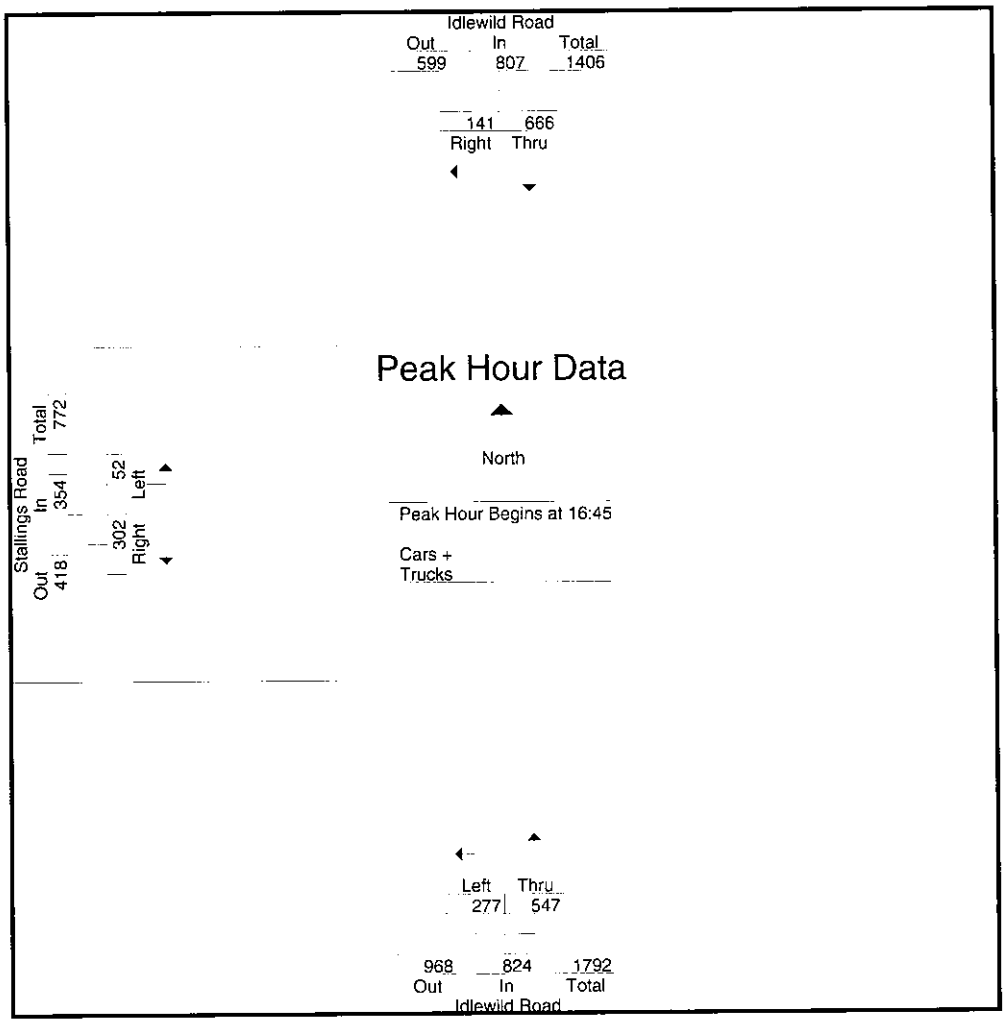
	Idlewild Road Southbound			Idlewild Road Northbound			Stallings Road Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:45										
16:45	**40**	158	198	116	66	182	82	9	91	471
17:00	33	**181**	**214**	131	71	202	66	**20**	86	502
17:15	31	175	206	**152**	60	212	**84**	16	**100**	**518**
17:30	37	152	189	148	**80**	**228**	70	7	77	494
Total Volume	141	666	807	547	277	824	302	52	354	1985
% App. Total	17.5	82.5		66.4	33.6		85.3	14.7		
PHF	.881	.920	.943	.900	.866	.904	.899	.650	.885	.958



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1202 Langdon Terrace Drive
Indian Trail, NC, 28079
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File Name : Matthews(Idlewild and I-485 SB Ramps) AM Peak
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Groups Printed- Cars + - Trucks

	I-485 SB Ramps Southbound				Idlewild Road Westbound				I-485 SB Ramps Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00	84	0	34	118	0	141	130	271	0	0	0	0	54	92	0	146	535
07:15	123	0	44	167	0	144	88	232	0	0	0	0	24	110	0	134	533
07:30	137	0	33	170	0	179	90	269	0	0	0	0	24	116	0	140	579
07:45	112	1	44	157	0	163	99	262	0	0	0	0	30	115	0	145	564
Total	456	1	155	612	0	627	407	1034	0	0	0	0	132	433	0	565	2211
08:00	63	0	39	102	0	153	101	254	0	0	0	0	31	123	0	154	510
08:15	71	2	38	111	0	144	94	238	0	0	0	0	21	79	0	100	449
08:30	42	0	53	95	0	135	77	212	0	0	0	0	23	77	0	100	407
08:45	40	0	48	88	0	119	73	192	0	0	0	0	29	64	0	93	373
Total	216	2	178	396	0	551	345	896	0	0	0	0	104	343	0	447	1739
Grand Total	672	3	333	1008	0	1178	752	1930	0	0	0	0	236	776	0	1012	3950
Apprch %	66.7	0.3	33		0	61	39		0	0	0		23.3	76.7	0		
Total %	17	0.1	8.4	25.5	0	29.8	19	48.9	0	0	0	0	6	19.6	0	25.6	
Cars +	668	3	320	991	0	1169	747	1916	0	0	0	0	233	768	0	1001	3908
% Cars +	99.4	100	96.1	98.3	0	99.2	99.3	99.3	0	0	0	0	98.7	99	0	98.9	98.9
Trucks	4	0	13	17	0	9	5	14	0	0	0	0	3	8	0	11	42
% Trucks	0.6	0	3.9	1.7	0	0.8	0.7	0.7	0	0	0	0	1.3	1	0	1.1	1.1

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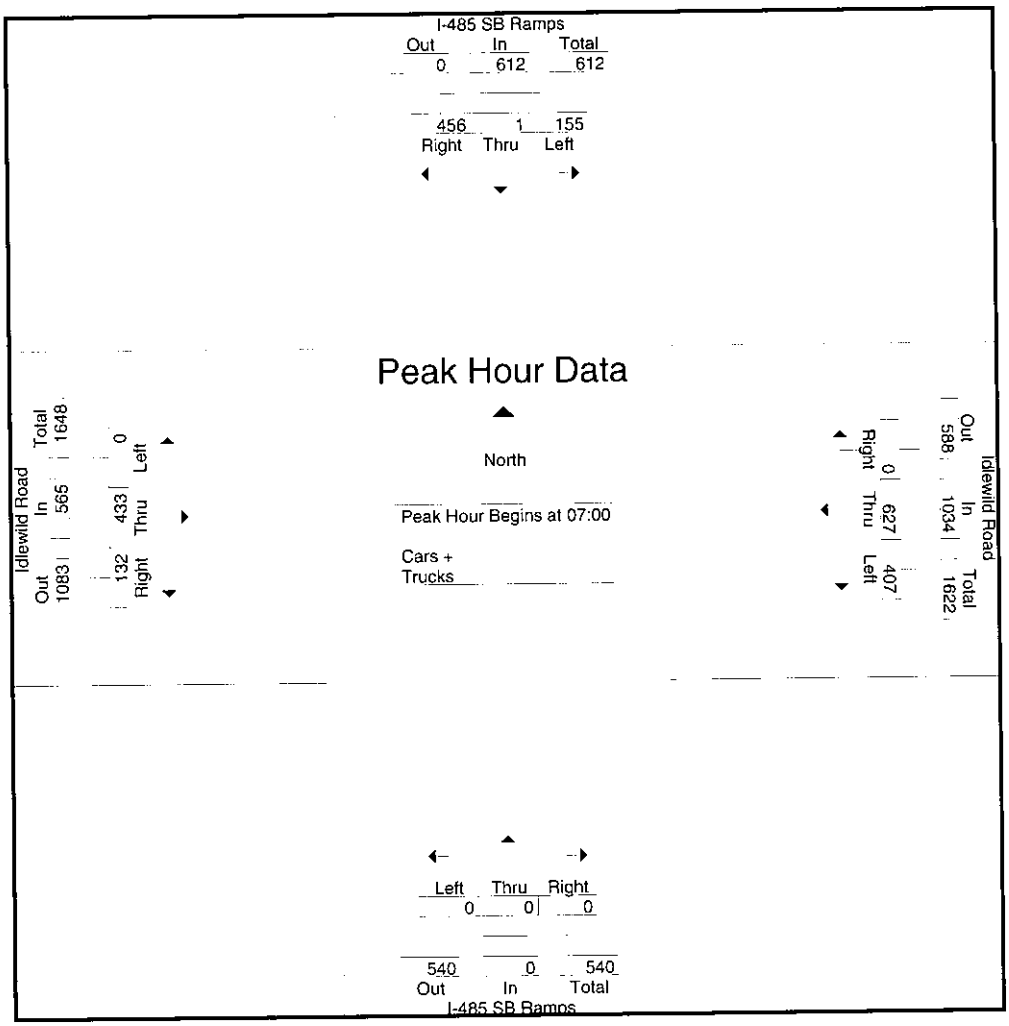
	I-485 SB Ramps Southbound				Idlewild Road Westbound				I-485 SB Ramps Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	**84**	**0**	**34**	**118**	**0**	**141**	130	271	0	0	0	0	54	92	0	146	535
07:15	123	0	**44**	167	0	144	88	232	0	0	0	0	24	110	0	134	533
07:30	**137**	0	33	**170**	0	**179**	90	269	0	0	0	0	24	**116**	0	140	**579**
07:45	112	**1**	44	157	0	163	99	262	0	0	0	0	30	115	0	145	564
Total Volume	456	1	155	612	0	627	407	1034	0	0	0	0	132	433	0	565	2211
% App. Total	74.5	0.2	25.3		0	60.6	39.4		0	0	0		23.4	76.6	0		
PHF	.832	.250	.881	.900	.000	.876	.783	.954	.000	.000	.000	.000	.611	.933	.000	.967	.955



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File Name : Matthews(Idlewild and I-485 SB Ramps) PM Peak
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Groups Printed- Cars + - Trucks

	I-485 SB Ramps Southbound				Idlewild Road Westbound				I-485 SB Ramps Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
16:00	53	0	52	105	0	125	55	180	0	0	0	0	24	143	0	167	452
16:15	57	0	63	120	0	121	54	175	0	0	0	0	21	162	0	183	478
16:30	61	0	85	146	0	128	42	170	0	0	0	0	23	186	0	209	525
16:45	61	0	58	119	0	135	66	201	0	0	0	0	30	182	0	212	532
Total	232	0	258	490	0	509	217	726	0	0	0	0	98	673	0	771	1987
17:00	64	1	74	139	0	173	67	240	0	0	0	0	33	190	0	223	602
17:15	93	1	75	169	0	167	63	230	0	0	0	0	34	211	0	245	644
17:30	76	1	61	138	0	151	61	212	0	0	0	0	36	185	0	221	571
17:45	67	0	55	122	0	156	74	230	0	0	0	0	26	191	0	217	569
Total	300	3	265	568	0	647	265	912	0	0	0	0	129	777	0	906	2386
Grand Total	532	3	523	1058	0	1156	482	1638	0	0	0	0	227	1450	0	1677	4373
Apprch %	50.3	0.3	49.4		0	70.6	29.4		0	0	0		13.5	86.5	0		
Total %	12.2	0.1	12	24.2	0	26.4	11	37.5	0	0	0	0	5.2	33.2	0	38.3	
Cars +	527	3	515	1045	0	1148	476	1624	0	0	0	0	227	1448	0	1675	4344
% Cars +	99.1	100	98.5	98.8	0	99.3	98.8	99.1	0	0	0	0	100	99.9	0	99.9	99.3
Trucks	5	0	8	13	0	8	6	14	0	0	0	0	0	2	0	2	29
% Trucks	0.9	0	1.5	1.2	0	0.7	1.2	0.9	0	0	0	0	0	0.1	0	0.1	0.7

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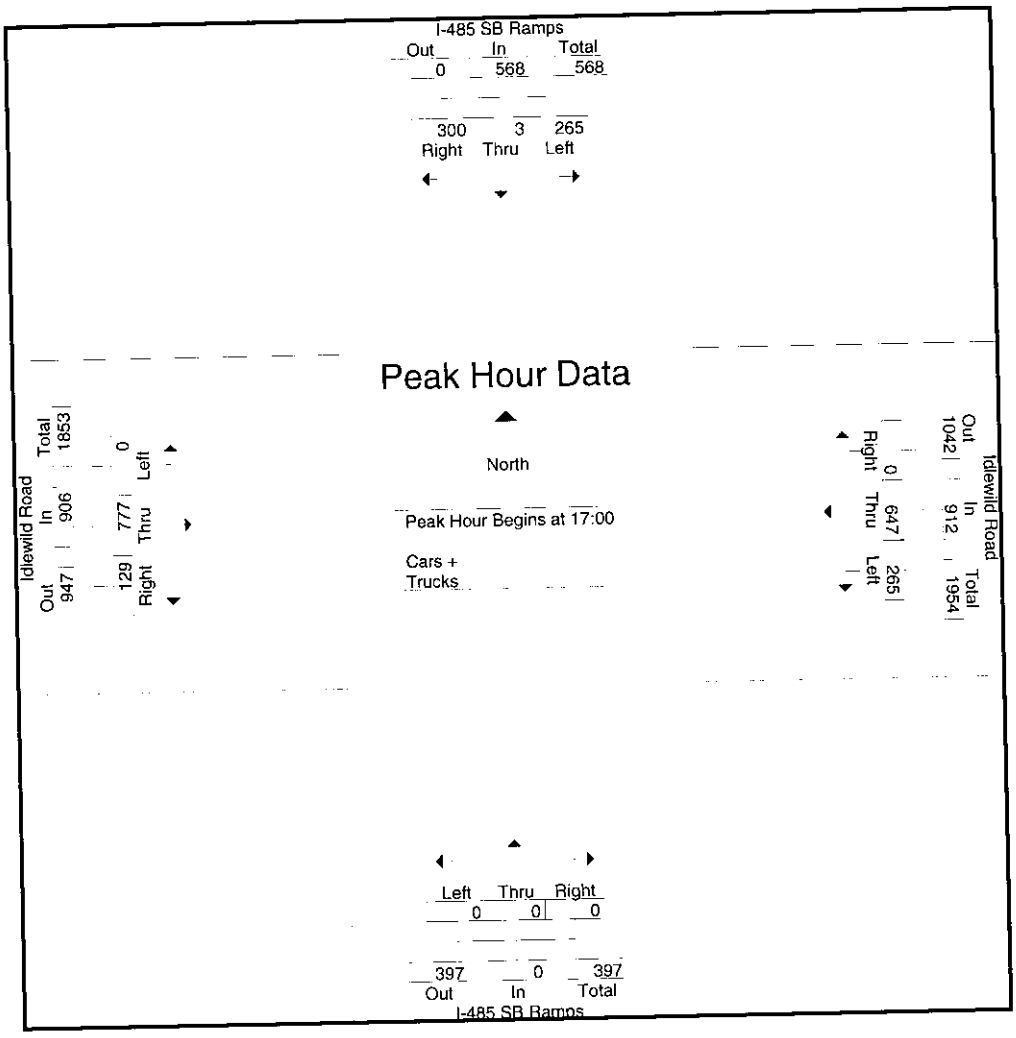
	I-485 SB Ramps Southbound				Idlewild Road Westbound				I-485 SB Ramps Northbound				Idlewild Road Eastbound			
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**64**	1	74	139	0	173	67	240	0	0	0	0	33	190	0	223	602
17:15	93	1	**75**	**169**	0	167	63	230	0	0	0	0	34	**211**	0	**245**	**644**
17:30	76	1	61	138	0	151	61	212	0	0	0	0	**36**	185	0	221	571
17:45	67	0	55	122	0	156	**74**	230	0	0	0	0	26	191	0	217	569
Total Volume	300	3	265	568	0	647	265	912	0	0	0	0	129	777	0	906	2386
% App. Total	52.8	0.5	46.7			0	70.9	29.1					14.2	85.8	0		
PHF	.806	.750	.883	.840	.000	.935	.895	.950	.000	.000	.000	.000	.896	.921	.000	.924	.926



Burns Service Inc.
1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and I-485 NB Ramps) AM Peak
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Groups Printed- Cars + - Trucks

	I-485 Ramp Southbound				Idlewild Road Westbound				I-485 Ramp Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00	0	0	0	0	84	240	0	324	30	0	25	55	0	90	40	130	509
07:15	0	0	0	0	76	200	0	276	36	0	28	64	0	105	50	155	495
07:30	0	0	0	0	103	243	0	346	50	0	31	81	0	92	58	150	577
07:45	0	0	0	0	85	220	0	305	39	0	41	80	0	94	65	159	544
Total	0	0	0	0	348	903	0	1251	155	0	125	280	0	381	213	594	2125
08:00	0	0	0	0	73	237	0	310	43	0	29	72	0	101	56	157	539
08:15	0	0	0	0	62	208	0	270	29	2	26	57	0	90	37	127	454
08:30	0	0	0	0	71	170	0	241	32	0	26	58	0	108	20	128	427
08:45	0	0	0	0	36	157	0	193	50	0	33	83	0	97	19	116	392
Total	0	0	0	0	242	772	0	1014	154	2	114	270	0	396	132	528	1812
Grand Total	0	0	0	0	590	1675	0	2265	309	2	239	550	0	777	345	1122	3937
Apprch %	0	0	0		26	74	0		56.2	0.4	43.5		0	69.3	30.7		
Total %	0	0	0	0	15	42.5	0	57.5	7.8	0.1	6.1	14	0	19.7	8.8	28.5	
Cars +	0	0	0	0	583	1671	0	2254	304	2	237	543	0	766	344	1110	3907
% Cars +	0	0	0	0	98.8	99.8	0	99.5	98.4	100	99.2	98.7	0	98.6	99.7	98.9	99.2
Trucks	0	0	0	0	7	4	0	11	5	0	2	7	0	11	1	12	30
% Trucks	0	0	0	0	1.2	0.2	0	0.5	1.6	0	0.8	1.3	0	1.4	0.3	1.1	0.8

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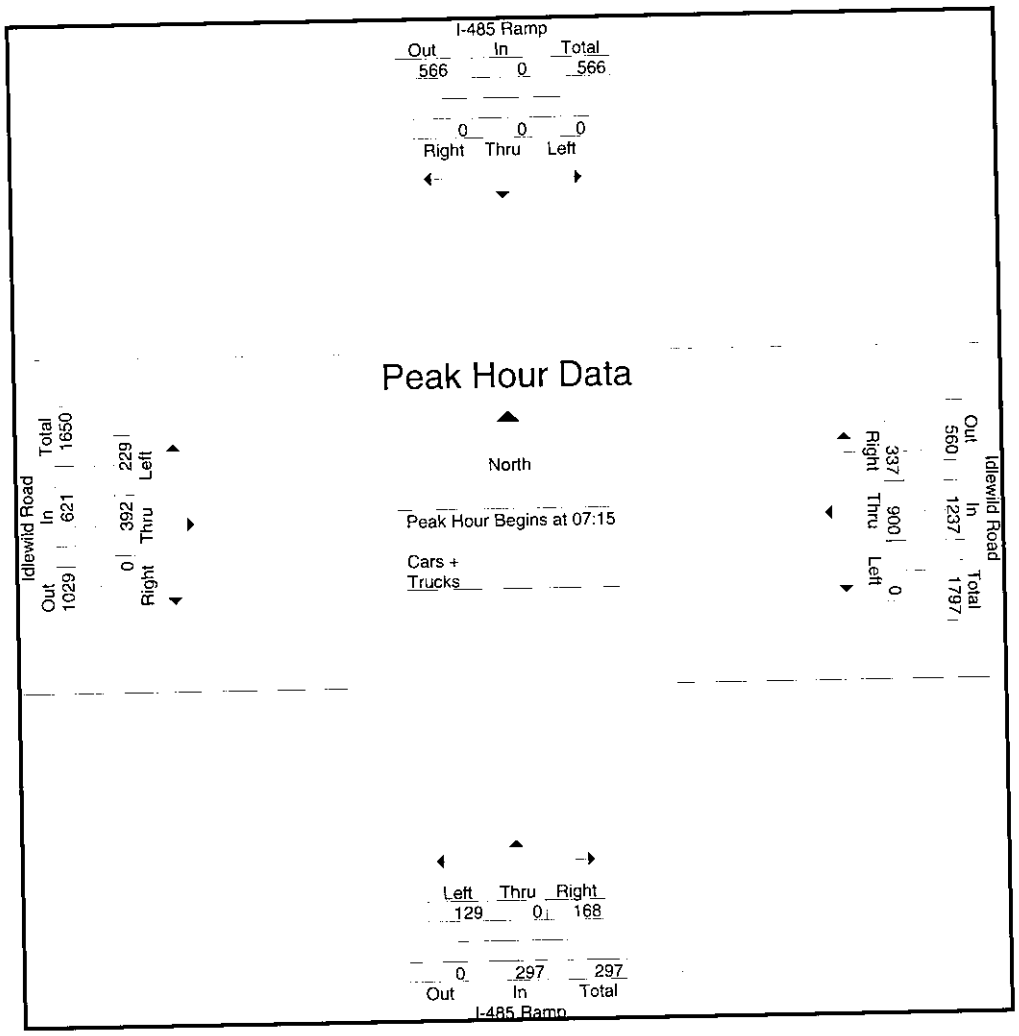
	I-485 Ramp Southbound				Idlewild Road Westbound				I-485 Ramp Northbound				Idlewild Road Eastbound			
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	**0**	**0**	**0**	**0**	**76**	**200**	**0**	**276**	**36**	**0**	**28**	**64**	**0**	105	50	155	495
07:30	0	0	0	0	103	243	0	346	**50**	0	31	**81**	0	92	58	150	**577**
07:45	0	0	0	0	85	220	0	305	39	0	**41**	80	0	94	**65**	**159**	544
08:00	0	0	0	0	73	237	0	310	43	0	29	72	0	101	56	157	539
Total Volume	0	0	0	0	337	900	0	1237	168	0	129	297	0	392	229	621	2155
% App. Total	0	0	0		27.2	72.8	0		56.6	0	43.4		0	63.1	36.9		
PHF	.000	.000	.000	.000	.818	.926	.000	.894	.840	.000	.787	.917	.000	.933	.881	.976	.934



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1202 Langdon Terrace Drive
Indian Trail, NC, 28079
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File Name : Matthews(Idlewild and I-485 NB Ramps) PM Peak
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Groups Printed- Cars + - Trucks

	I-485 NB Ramps Southbound				Idlewild Road Westbound				I-485 NB Ramps Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
16:00	0	0	0	0	65	121	0	186	113	0	46	159	0	155	39	194	539
16:15	0	0	0	0	67	116	0	183	105	0	51	156	0	173	38	211	550
16:30	0	0	0	0	49	135	0	184	133	0	63	196	0	210	54	264	644
16:45	0	0	0	0	79	127	0	206	122	0	70	192	0	190	51	241	639
Total	0	0	0	0	260	499	0	759	473	0	230	703	0	728	182	910	2372
17:00	0	0	0	0	80	176	0	256	127	0	62	189	0	191	69	260	705
17:15	0	0	0	0	74	159	0	233	98	0	67	165	0	216	64	280	678
17:30	0	0	0	0	74	162	0	236	96	0	45	141	0	184	53	237	614
17:45	0	0	0	0	58	163	0	221	109	0	59	168	0	182	60	242	631
Total	0	0	0	0	286	660	0	946	430	0	233	663	0	773	246	1019	2628
Grand Total	0	0	0	0	546	1159	0	1705	903	0	463	1366	0	1501	428	1929	5000
Apprch %	0	0	0		32	68	0		66.1	0	33.9		0	77.8	22.2		
Total %	0	0	0	0	10.9	23.2	0	34.1	18.1	0	9.3	27.3	0	30	8.6	38.6	
Cars +	0	0	0	0	534	1155	0	1689	896	0	463	1359	0	1499	426	1925	4973
% Cars +	0	0	0	0	97.8	99.7	0	99.1	99.2	0	100	99.5	0	99.9	99.5	99.8	99.5
Trucks	0	0	0	0	12	4	0	16	7	0	0	7	0	2	2	4	27
% Trucks	0	0	0	0	2.2	0.3	0	0.9	0.8	0	0	0.5	0	0.1	0.5	0.2	0.5

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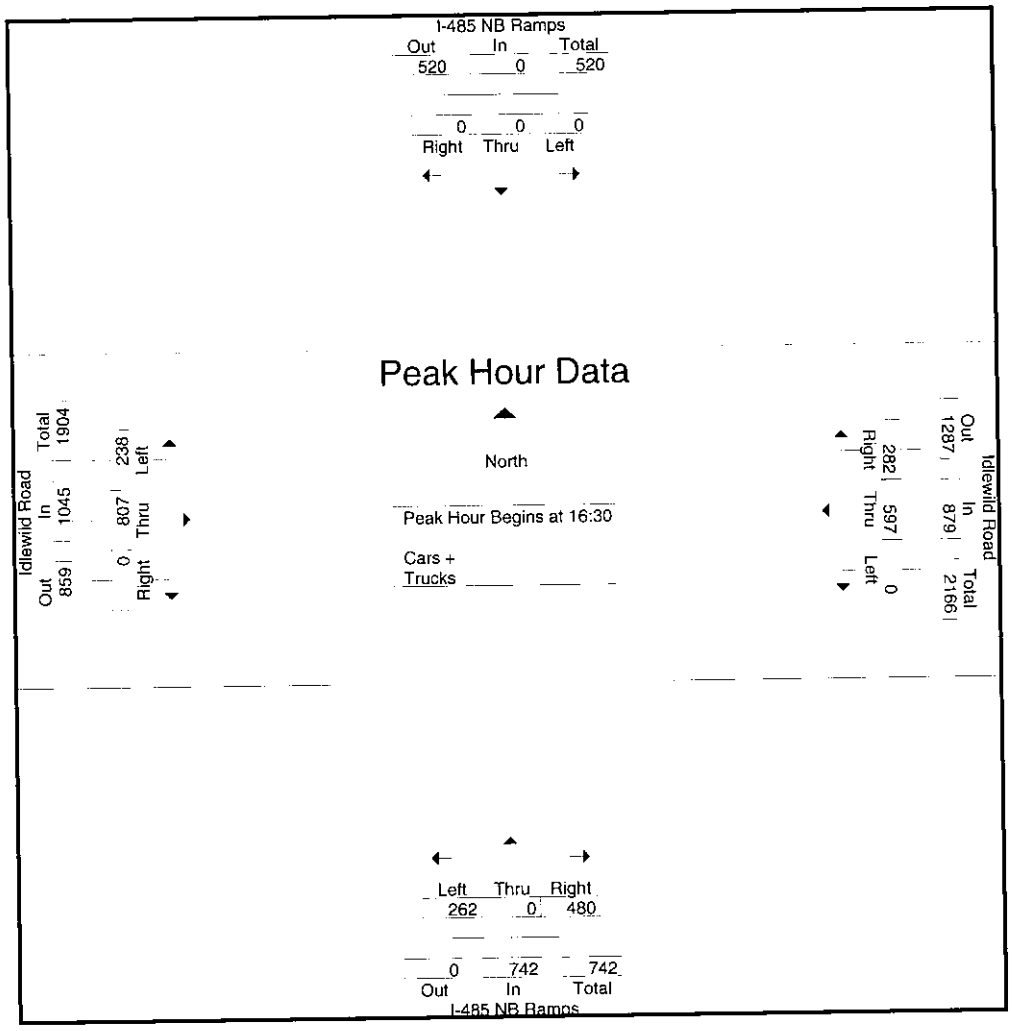
	I-485 NB Ramps Southbound				Idlewild Road Westbound				I-485 NB Ramps Northbound				Idlewild Road Eastbound			
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	**0**	**0**	**0**	**0**	**49**	**135**	**0**	**184**	133	0	63	196	0	210	54	264	644
16:45	0	0	0	0	79	127	0	206	122	0	70	192	0	190	51	241	639
17:00	0	0	0	0	60	**176**	0	**256**	127	0	62	189	0	191	**69**	260	**705**
17:15	0	0	0	0	74	159	0	233	98	0	67	165	0	**216**	64	**280**	678
Total Volume	0	0	0	0	282	597	0	879	480	0	262	742	0	807	238	1045	2666
% App. Total	0	0	0		32.1	67.9	0		64.7	0	35.3		0	77.2	22.8		
PHF	.000	.000	.000	.000	.881	.848	.000	.858	.902	.000	.936	.946	.000	.934	.862	.933	.945



1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and Marshall Hooks) AM Peak
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Groups Printed- Cars + - Trucks

	Marshall Hooks Road Southbound				Idlewild Road Westbound				Boyd Funderburk Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00	0	0	0	0	0	325	1	326	0	0	1	1	0	122	0	122	449
07:15	0	1	0	1	0	281	0	281	0	0	0	0	1	142	0	143	425
07:30	0	0	0	0	0	334	1	335	0	0	0	0	0	145	0	145	480
07:45	0	0	0	0	0	312	1	313	0	0	0	0	3	139	0	142	455
Total	0	1	0	1	0	1252	3	1255	0	0	1	1	4	548	0	552	1809
08:00	0	0	0	0	0	197	0	197	0	0	0	0	0	235	0	235	432
08:15	0	0	0	0	0	144	0	144	0	0	0	0	0	248	0	248	392
08:30	0	0	0	0	0	241	0	241	0	0	0	0	0	145	0	145	386
08:45	0	0	0	0	0	189	0	189	0	0	0	0	0	144	0	144	333
Total	0	0	0	0	0	771	0	771	0	0	0	0	0	772	0	772	1543
Grand Total	0	1	0	1	0	2023	3	2026	0	0	1	1	4	1320	0	1324	3352
Apprch %	0	100	0		0	99.9	0.1		0	0	100		0.3	99.7	0		
Total %	0	0	0	0	0	60.4	0.1	60.4	0	0	0	0	0.1	39.4	0	39.5	
Cars +	0	1	0	1	0	1991	2	1993	0	0	1	1	3	1295	0	1298	3293
% Cars +	0	100	0	100	0	98.4	66.7	98.4	0	0	100	100	75	98.1	0	98	98.2
Trucks	0	0	0	0	0	32	1	33	0	0	0	0	1	25	0	26	59
% Trucks	0	0	0	0	0	1.6	33.3	1.6	0	0	0	0	25	1.9	0	2	1.8

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File Name : Matthews(Idlewild and Marshall Hooks) AM Peak
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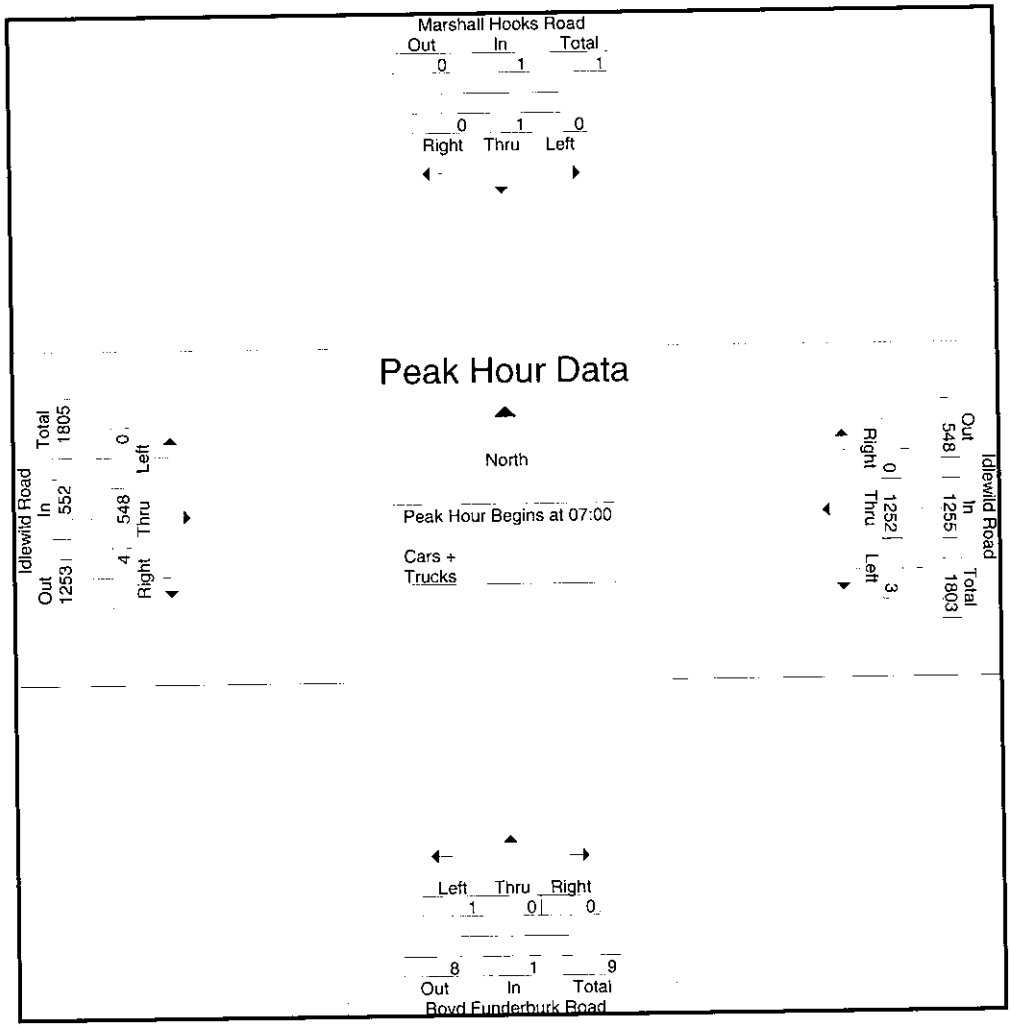
	Marshall Hooks Road Southbound				Idlewild Road Westbound				Boyd Funderburk Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	**0**	**0**	**0**	**0**	**0**	**325**	,	326	0	0	,	,	0	122	0	122	449
07:15	0	,	0	**1**	0	281	0	281	0	0	0	0	1	142	0	143	425
07:30	0	0	0	0	0	**334**	1	**335**	0	0	0	0	0	**145**	0	**145**	**480**
07:45	0	0	0	0	0	312	1	313	0	0	0	0	**3**	139	0	142	455
Total Volume	0	**1**	0	1	0	1252	3	1255	0	0	1	1	4	548	0	552	1809
% App. Total	0	100	0		0	99.8	0.2		0	0	100		0.7	99.3	0		
PHF	.000	.250	.000	.250	.000	.937	.750	.937	.000	.000	.250	.250	.333	.945	.000	.952	.942



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We Count because YOU Count

File Name : Matthews(Idlewild and Marshall Hooks) PM Peak
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Groups Printed- Cars + - Trucks

	Marshall Hooks Road Southbound				Idlewild Road Westbound				Boyd Funderburk Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
16:00	0	0	0	0	0	169	0	169	0	0	0	0	0	283	0	283	452
16:15	0	0	0	0	0	161	0	161	0	0	0	0	1	279	0	280	441
16:30	0	0	0	0	0	151	0	151	0	0	0	0	0	328	0	328	479
16:45	0	0	0	0	0	205	0	205	0	0	0	0	0	299	0	299	504
Total	0	0	0	0	0	686	0	686	0	0	0	0	1	1189	0	1190	1876
17:00	1	0	0	1	1	227	0	228	0	0	0	0	0	315	0	315	544
17:15	0	0	0	0	0	230	1	231	0	0	0	0	0	309	0	309	540
17:30	0	0	0	0	0	230	0	230	0	0	0	0	0	259	1	260	490
17:45	0	0	0	0	2	229	1	232	0	0	1	1	0	277	0	277	510
Total	1	0	0	1	3	916	2	921	0	0	1	1	0	1160	1	1161	2084
Grand Total	1	0	0	1	3	1602	2	1607	0	0	1	1	1	2349	1	2351	3960
Apprch %	100	0	0		0.2	99.7	0.1		0	0	100		0	99.9	0		
Total %	0	0	0	0	0.1	40.5	0.1	40.6	0	0	0	0	0	59.3	0	59.4	
Cars +	1	0	0	1	3	1582	2	1587	0	0	1	1	1	2323	1	2325	3914
% Cars +	100	0	0	100	100	98.8	100	98.8	0	0	100	100	100	98.9	100	98.9	98.8
Trucks	0	0	0	0	0	20	0	20	0	0	0	0	0	26	0	26	46
% Trucks	0	0	0	0	0	1.2	0	1.2	0	0	0	0	0	1.1	0	1.1	1.2

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File Name : Matthews(Idlewild and Marshall Hooks) PM Peak
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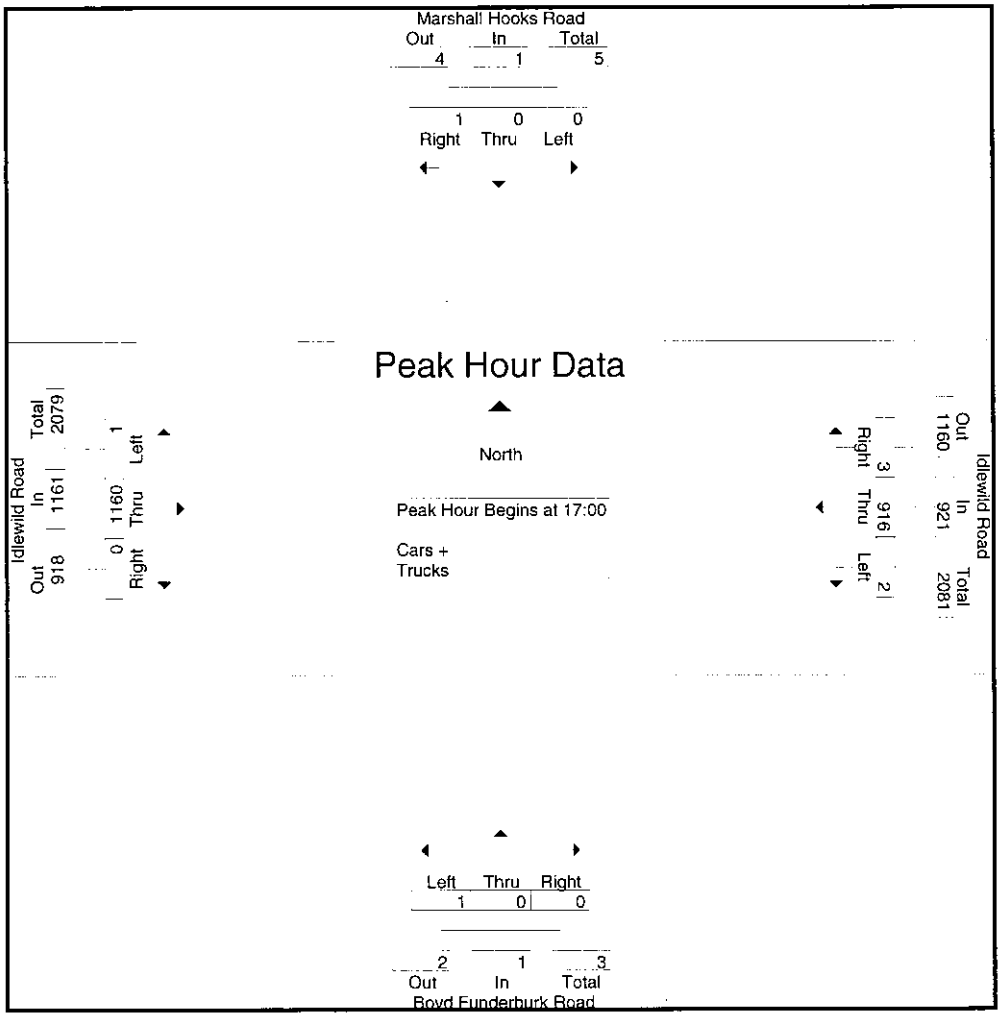
	Marshall Hooks Road Southbound				Idlewild Road Westbound				Boyd Funderburk Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	1	0	0	1	1	227	0	228	0	0	0	0	0	315	0	315	**544**
17:15	0	0	0	0	0	**230**	**1**	231	0	0	0	0	0	309	0	309	540
17:30	0	0	0	0	0	230	0	230	0	0	0	0	0	259	**1**	260	490
17:45	0	0	0	0	**2**	229	1	**232**	0	0	**1**	**1**	0	277	0	277	510
Total Volume	1	0	0	1	3	916	2	921	0	0	1	1	0	1160	1	1161	2084
% App. Total	100	0	0		0.3	99.5	0.2		0	0	100		0	99.9	0.1		
PHF	.250	.000	.000	.250	.375	.996	.500	.992	.000	.000	.250	.250	.000	.921	.250	.921	.958



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File Name : Matthews(Idlewild and Idlewild Market Access) AM Peak
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Groups Printed- Cars + - Trucks

	Idlewild Road Westbound				Idlewild Market Access Northbound				Idlewild Road Eastbound				
Start Time	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	Int. Total
07:00	312	14	0	326	2	7	0	9	1	97	0	98	433
07:15	267	27	1	295	6	7	0	13	1	121	0	122	430
07:30	288	11	0	299	2	15	0	17	2	97	0	99	415
07:45	297	18	0	315	1	10	0	11	3	111	0	114	440
Total	1164	70	1	1235	11	39	0	50	7	426	0	433	1718
08:00	285	14	0	299	7	17	0	24	2	115	0	117	440
08:15	267	27	0	294	4	14	0	18	1	98	0	99	411
08:30	225	11	0	236	8	10	0	18	2	103	0	105	359
08:45	179	23	0	202	5	9	0	14	1	102	0	103	319
Total	956	75	0	1031	24	50	0	74	6	418	0	424	1529
Grand Total	2120	145	1	2266	35	89	0	124	13	844	0	857	3247
Apprch %	93.6	6.4	0		28.2	71.8	0		1.5	98.5	0		
Total %	65.3	4.5	0	69.8	1.1	2.7	0	3.8	0.4	26	0	26.4	
Cars +	2106	144	1	2251	35	89	0	124	13	832	0	845	3220
% Cars +	99.3	99.3	100	99.3	100	100	0	100	100	98.6	0	98.6	99.2
Trucks	14	1	0	15	0	0	0	0	0	12	0	12	27
% Trucks	0.7	0.7	0	0.7	0	0	0	0	0	1.4	0	1.4	0.8

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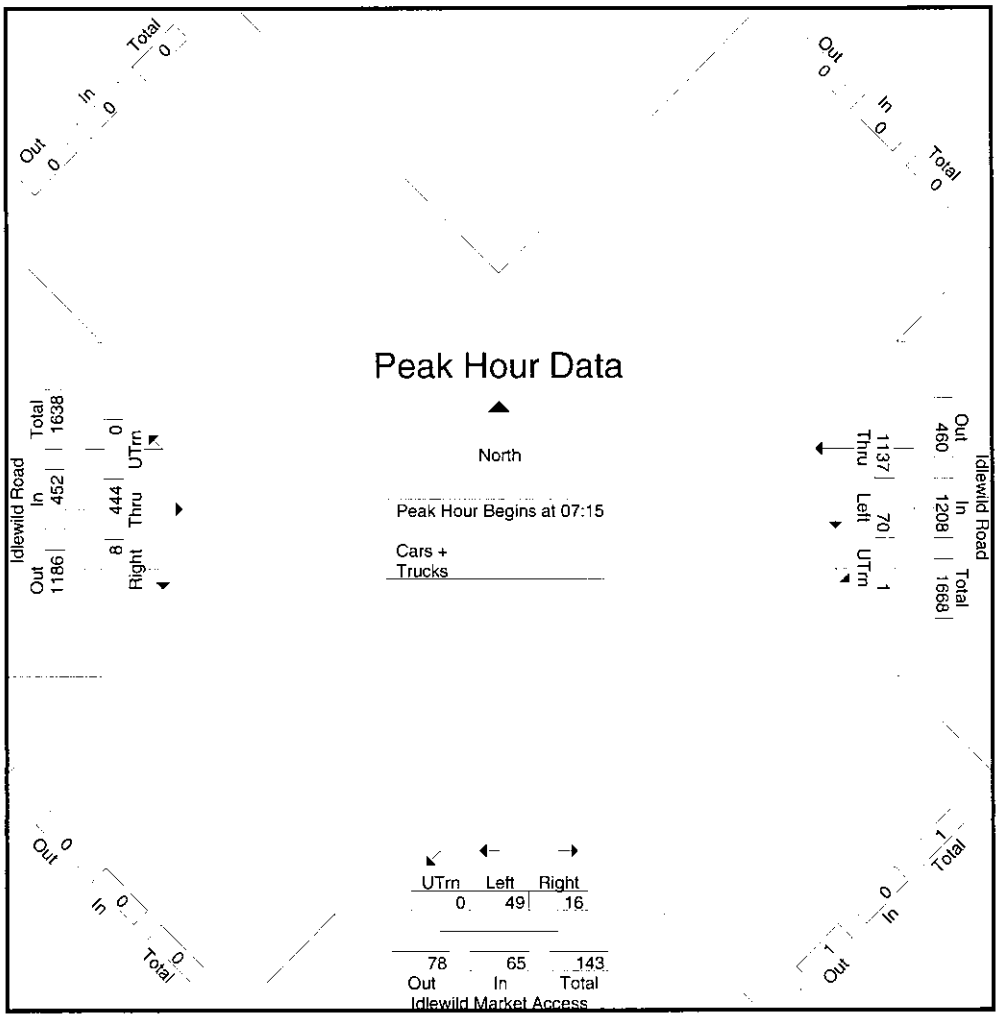
	Idlewild Road Westbound				Idlewild Market Access Northbound				Idlewild Road Eastbound				
Start Time	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15													
07:15	267	**27**	**1**	295	6	7	0	13	1	**121**	0	**122**	430
07:30	288	11	0	299	2	15	0	17	2	97	0	99	415
07:45	**297**	18	0	**315**	1	10	0	11	**3**	111	0	114	**440**
08:00	285	14	0	299	7	17	0	**24**	2	115	0	117	440
Total Volume	1137	70	1	1208	16	49	0	65	8	444	0	452	1725
% App. Total	94.1	5.8	0.1		24.6	75.4	0		1.8	98.2	0		
PHF	.957	.648	.250	.959	.571	.721	.000	.677	.667	.917	.000	.926	.980



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File Name : Matthews(Idlewild and Idlewild Market Access) PM Peak
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Groups Printed- Cars + - Trucks

	Idlewild Road Westbound				Idlewild Market Access Northbound				Idlewild Road Eastbound				
Start Time	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	Int. Total
16:00	129	24	0	153	25	13	0	38	4	222	0	226	417
16:15	157	21	0	178	24	19	0	43	0	240	0	240	461
16:30	150	26	0	176	35	25	0	60	7	239	0	246	482
16:45	163	21	0	184	44	22	0	66	11	247	0	258	508
Total	599	92	0	691	128	79	0	207	22	948	0	970	1868
17:00	199	20	0	219	43	31	0	74	10	243	0	253	546
17:15	190	24	0	214	52	38	0	90	5	243	0	248	552
17:30	192	16	0	208	54	20	0	74	8	220	0	228	510
17:45	184	26	0	210	52	27	0	79	4	233	0	237	526
Total	765	86	0	851	201	116	0	317	27	939	0	966	2134
Grand Total	1364	178	0	1542	329	195	0	524	49	1887	0	1936	4002
Apprch %	88.5	11.5	0		62.8	37.2	0		2.5	97.5	0		
Total %	34.1	4.4	0	38.5	8.2	4.9	0	13.1	1.2	47.2	0	48.4	
Cars +	1350	177	0	1527	329	193	0	522	49	1868	0	1917	3966
% Cars +	99	99.4	0	99	100	99	0	99.6	100	99	0	99	99.1
Trucks	14	1	0	15	0	2	0	2	0	19	0	19	36
% Trucks	1	0.6	0	1	0	1	0	0.4	0	1	0	1	0.9

1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and Idlewild Market Access) PM Peak
Site Code :
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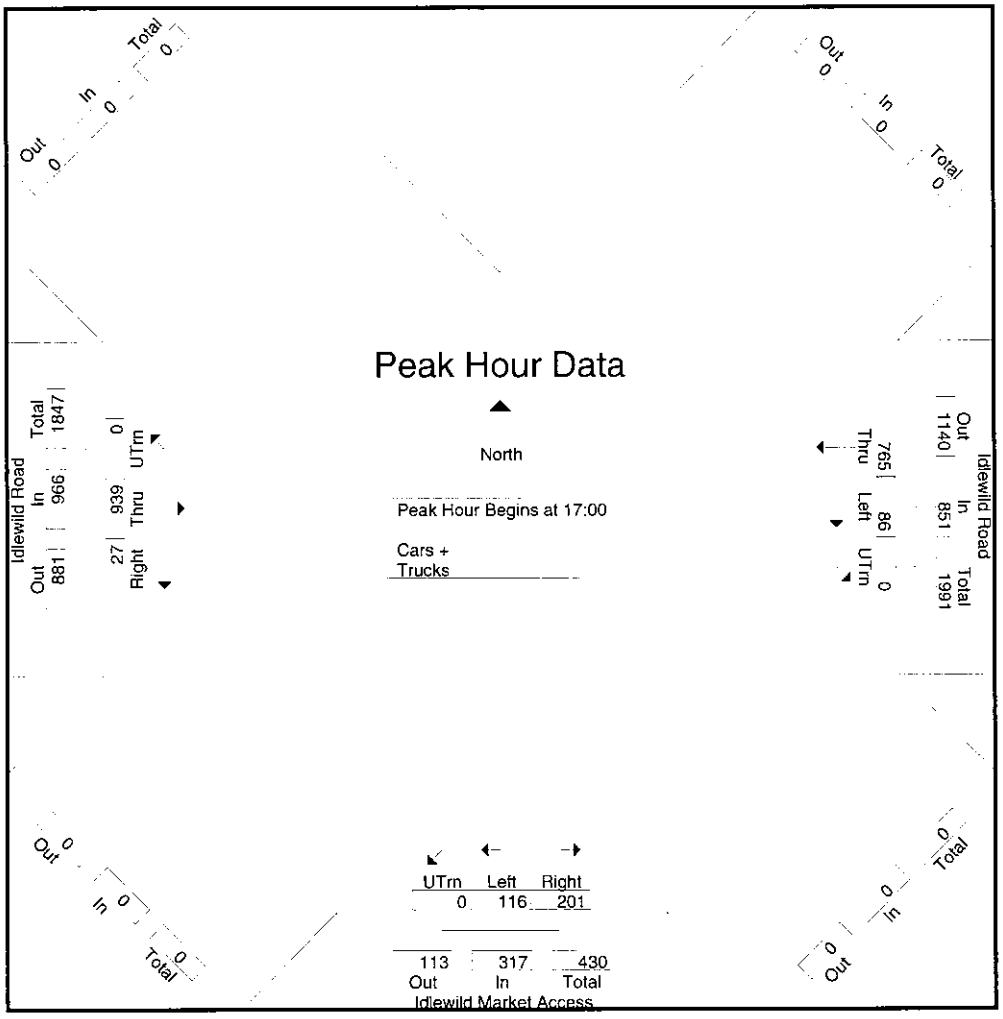
	Idlewild Road Westbound				Idlewild Market Access Northbound				Idlewild Road Eastbound				
Start Time	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 17:00													
17:00	**199**	20	0	**219**	43	31	0	74	**10**	**243**	0	**253**	546
17:15	190	24	0	214	52	**38**	0	**90**	5	243	0	248	**552**
17:30	192	16	0	208	**54**	20	0	74	8	220	0	228	510
17:45	184	**26**	0	210	52	27	0	79	4	233	0	237	526
Total Volume	765	86	0	851	201	116	0	317	27	939	0	966	2134
% App. Total	89.9	10.1	0		63.4	36.6	0		2.8	97.2	0		
PHF	.961	.827	.000	.971	.931	.763	.000	.881	.675	.966	.000	.955	.966



1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and Stevens Mill) AM Peak
Site Code :
Start Date : 6/6/2018
Page No : 1

Groups Printed- Cars + - Trucks

	Stevens Mill Road Southbound				Idlewild Road Westbound				Stevens Mill Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00	60	27	32	119	12	225	10	247	15	9	25	49	9	83	8	100	515
07:15	78	44	28	150	9	206	23	238	15	10	24	49	13	99	11	123	560
07:30	70	52	24	146	11	226	22	259	14	27	20	61	22	89	9	120	586
07:45	66	33	24	123	6	212	20	238	17	25	18	60	14	88	15	117	538
Total	274	156	108	538	38	869	75	982	61	71	87	219	58	359	43	460	2199
08:00	51	30	19	100	11	228	15	254	16	25	15	56	24	89	20	133	543
08:15	48	17	16	81	8	209	9	226	13	12	22	47	4	89	15	108	462
08:30	51	23	16	90	14	169	5	188	6	9	22	37	13	99	19	131	446
08:45	45	19	19	83	17	154	16	187	14	6	11	31	14	96	21	131	432
Total	195	89	70	354	50	760	45	855	49	52	70	171	55	373	75	503	1883
Grand Total	469	245	178	892	88	1629	120	1837	110	123	157	390	113	732	118	963	4082
Apprch %	52.6	27.5	20		4.8	88.7	6.5		28.2	31.5	40.3		11.7	76	12.3		
Total %	11.5	6	4.4	21.9	2.2	39.9	2.9	45	2.7	3	3.8	9.6	2.8	17.9	2.9	23.6	
Cars +	469	245	178	892	85	1619	114	1818	106	123	156	385	113	718	118	949	4044
% Cars +	100	100	100	100	96.6	99.4	95	99	96.4	100	99.4	98.7	100	98.1	100	98.5	99.1
Trucks	0	0	0	0	3	10	6	19	4	0	1	5	0	14	0	14	38
% Trucks	0	0	0	0	3.4	0.6	5	1	3.6	0	0.6	1.3	0	1.9	0	1.5	0.9

1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and Stevens Mill) AM Peak
Site Code :
Start Date : 6/6/2018
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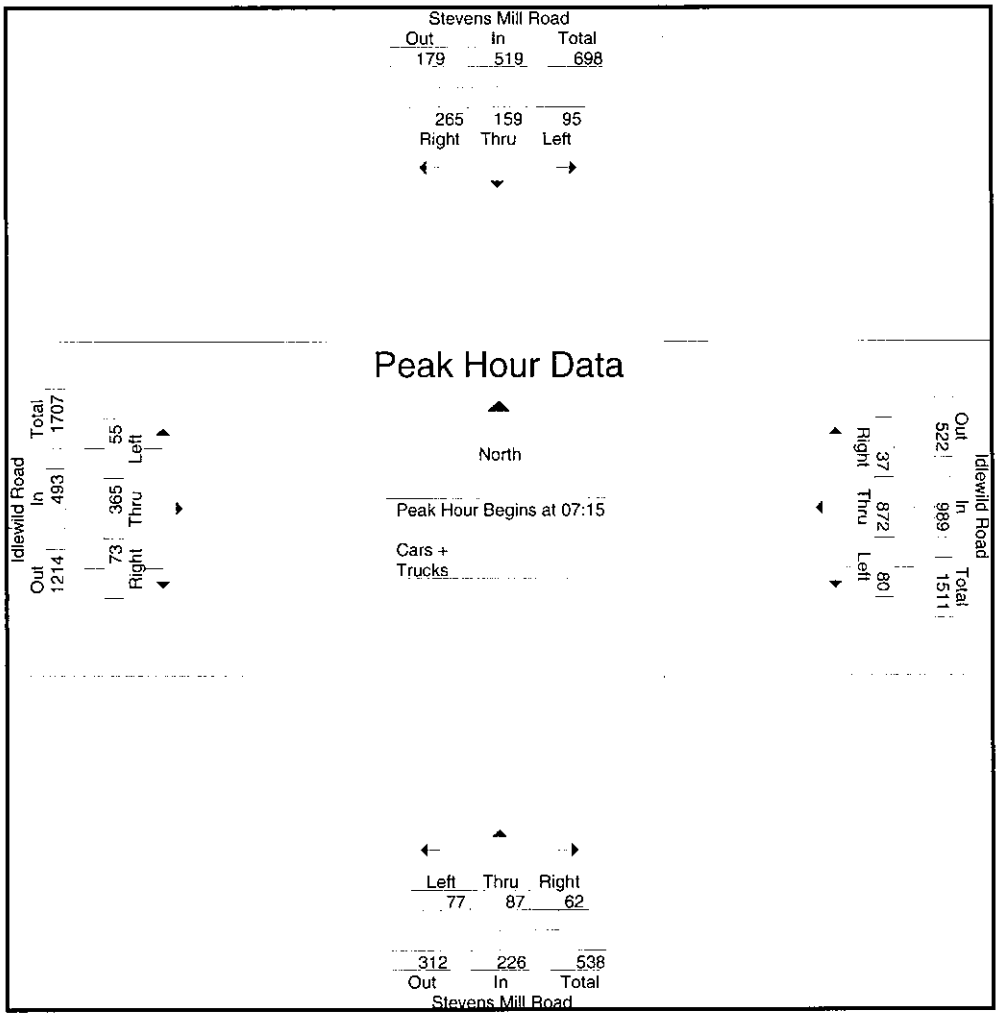
	Stevens Mill Road Southbound				Idlewild Road Westbound				Stevens Mill Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	78	44	28	150	9	206	23	238	15	10	**24**	49	13	**99**	11	123	560
07:30	70	**52**	24	146	**11**	226	22	**259**	14	**27**	20	**61**	22	89	9	120	**586**
07:45	66	33	24	123	6	212	20	238	**17**	25	18	60	14	88	15	**117**	538
08:00	51	30	19	100	11	**228**	15	254	16	25	15	56	**24**	89	**20**	**133**	543
Total Volume	265	159	95	519	37	872	80	989	62	87	77	226	73	365	55	493	2227
% App. Total	51.1	30.6	18.3		3.7	88.2	8.1		27.4	38.5	34.1		14.8	74	11.2		
PHF	.849	.764	.848	.865	.841	.956	.870	.955	.912	.806	.802	.926	.760	.922	.688	.927	.950



1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and Stevens Mill) PM Peak
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Groups Printed- Cars + - Trucks

	Stevens Mill Road Southbound				Idlewild Road Westbound				Stevens Mill Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
16:00	23	17	21	61	24	125	17	166	17	27	24	68	21	197	49	267	562
16:15	26	26	16	68	27	148	16	191	17	22	17	56	21	199	47	267	582
16:30	30	16	17	63	28	119	5	152	27	25	26	78	20	226	54	300	593
16:45	22	20	18	60	32	160	10	202	22	28	22	72	23	225	61	309	643
Total	101	79	72	252	111	552	48	711	83	102	89	274	85	847	211	1143	2380
17:00	41	24	16	81	36	154	9	199	23	32	22	77	22	216	50	288	645
17:15	44	18	19	81	15	174	13	202	27	33	24	84	25	224	43	292	659
17:30	42	20	16	78	35	158	10	203	26	29	14	69	24	200	54	278	628
17:45	45	26	18	89	35	169	9	213	22	30	22	74	17	223	62	302	678
Total	172	88	69	329	121	655	41	817	98	124	82	304	88	863	209	1160	2610
Grand Total	273	167	141	581	232	1207	89	1528	181	226	171	578	173	1710	420	2303	4990
Apprch %	47	28.7	24.3		15.2	79	5.8		31.3	39.1	29.6		7.5	74.3	18.2		
Total %	5.5	3.3	2.8	11.6	4.6	24.2	1.8	30.6	3.6	4.5	3.4	11.6	3.5	34.3	8.4	46.2	
Cars +	273	163	141	577	232	1193	88	1513	180	226	170	576	173	1696	420	2289	4955
% Cars +	100	97.6	100	99.3	100	98.8	98.9	99	99.4	100	99.4	99.7	100	99.2	100	99.4	99.3
Trucks	0	4	0	4	0	14	1	15	1	0	1	2	0	14	0	14	35
% Trucks	0	2.4	0	0.7	0	1.2	1.1	1	0.6	0	0.6	0.3	0	0.8	0	0.6	0.7

1202 Langdon Terrace Drive
Indian Trail, NC, 28079
We Count because YOU Count

File Name : Matthews(Idlewild and Stevens Mill) PM Peak
Site Code :
Start Date : 6/6/2018
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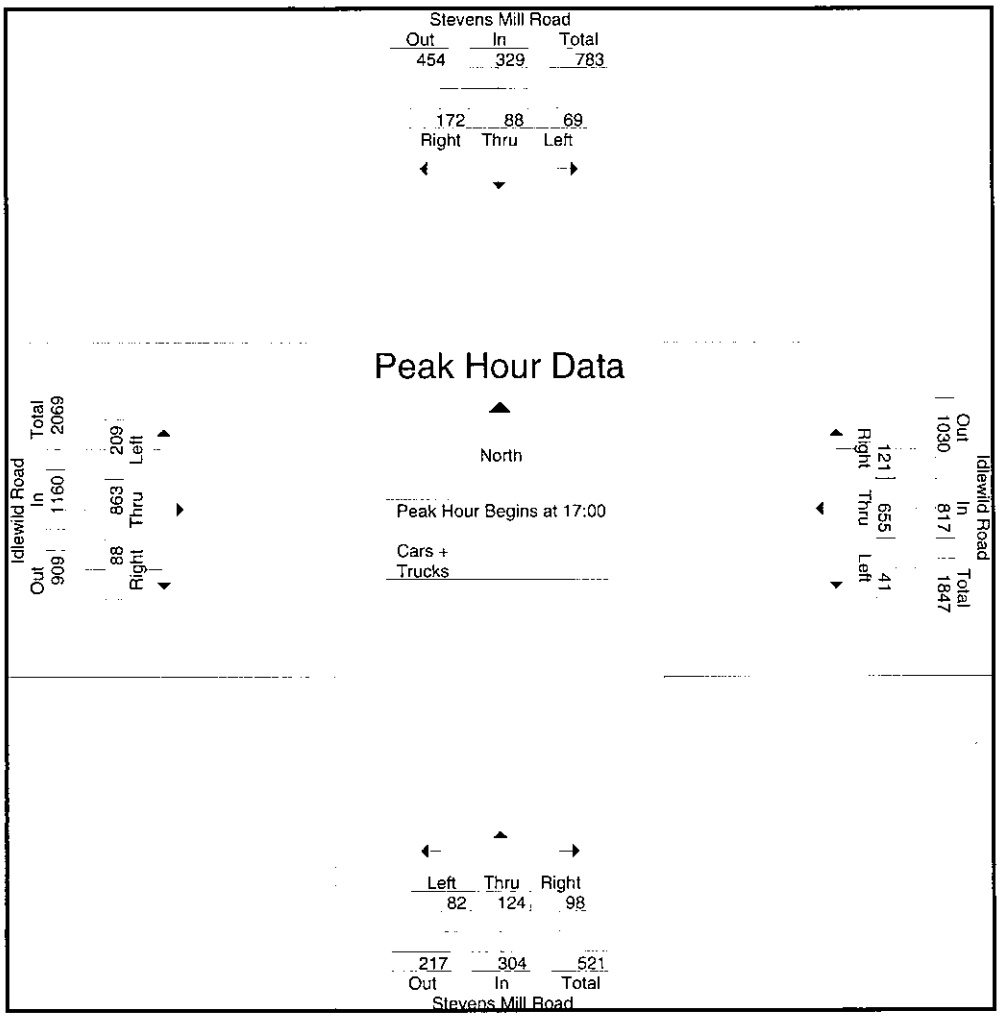
	Stevens Mill Road Southbound				Idlewild Road Westbound				Stevens Mill Road Northbound				Idlewild Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**41**	**24**	**16**	**81**	36	154	9	199	23	32	22	77	22	216	50	288	645
17:15	44	18	19	81	15	174	13	202	**27**	**33**	**24**	**84**	**25**	**224**	43	292	659
17:30	42	20	16	78	35	158	10	203	26	29	14	69	24	200	54	278	628
17:45	**45**	**26**	18	**89**	35	169	9	**213**	22	30	22	74	17	223	**62**	**302**	**678**
Total Volume	172	88	69	329	121	655	41	817	98	124	82	304	88	863	209	1160	2610
% App. Total	52.3	26.7	21		14.8	80.2	5		32.2	40.8	27		7.6	74.4	18		
PHF	.956	.846	.908	.924	.840	.941	.788	.959	.907	.939	.854	.905	.880	.963	.843	.960	.962



TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Crismark) AM Peak
Site Code :
Start Date : 10/2/2018
Page No : 1

Groups Printed- Cars + - Trucks

	Idlewild Road Southbound			Crismark Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
07:00	118	7	125	56	5	61	3	204	207	393
07:15	121	3	124	53	3	56	5	195	200	380
07:30	118	7	125	47	5	52	8	198	206	383
07:45	118	12	130	51	1	52	2	170	172	354
Total	475	29	504	207	14	221	18	767	785	1510
08:00	89	9	98	34	2	36	5	186	191	325
08:15	97	10	107	24	3	27	5	213	218	352
08:30	119	11	130	22	1	23	3	155	158	311
08:45	101	12	113	22	1	23	3	182	185	321
Total	406	42	448	102	7	109	16	736	752	1309
Grand Total	881	71	952	309	21	330	34	1503	1537	2819
Apprch %	92.5	7.5		93.6	6.4		2.2	97.8		
Total %	31.3	2.5	33.8	11	0.7	11.7	1.2	53.3	54.5	
Cars +	868	71	939	309	21	330	34	1493	1527	2796
% Cars +	98.5	100	98.6	100	100	100	100	99.3	99.3	99.2
Trucks	13	0	13	0	0	0	0	10	10	23
% Trucks	1.5	0	1.4	0	0	0	0	0.7	0.7	0.8

TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Crismark) AM Peak
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Start Date : 10/2/2018
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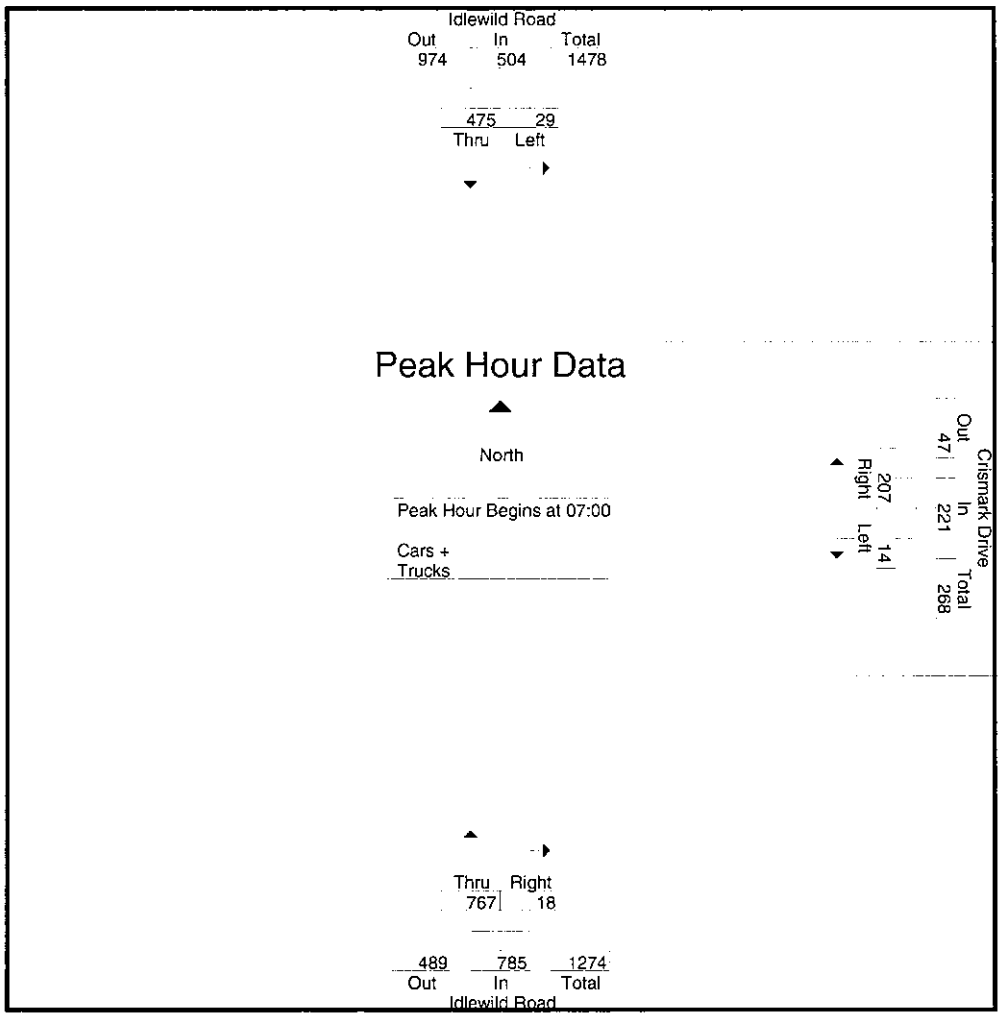
	Idlewild Road Southbound			Crismark Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00										
07:00	118	7	125	**56**	**5**	**61**	3	**204**	**207**	**393**
07:15	**121**	3	124	53	3	56	5	195	200	380
07:30	118	7	125	47	5	52	**8**	198	206	383
07:45	118	**12**	**130**	51	1	52	2	170	172	354
Total Volume	475	29	504	207	14	221	18	767	785	1510
% App. Total	94.2	5.8		93.7	6.3		2.3	97.7		
PHF	.981	.604	.969	.924	.700	.906	.563	.940	.948	.961



TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Crismark) PM Peak
Site Code :
Start Date : 10/2/2018
Page No : 1

Groups Printed- Cars + - Trucks

	Idlewild Road Southbound			Crismark Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
16:00	206	31	237	24	2	26	5	169	174	437
16:15	213	30	243	22	0	22	5	174	179	444
16:30	237	35	272	19	4	23	6	151	157	452
16:45	221	35	256	18	3	21	5	169	174	451
Total	877	131	1008	83	9	92	21	663	684	1784
17:00	222	40	262	9	3	12	4	195	199	473
17:15	205	35	240	23	3	26	8	209	217	483
17:30	240	38	278	13	0	13	10	196	206	497
17:45	222	33	255	25	4	29	6	176	182	466
Total	889	146	1035	70	10	80	28	776	804	1919
Grand Total	1766	277	2043	153	19	172	49	1439	1488	3703
Apprch %	86.4	13.6		89	11		3.3	96.7		
Total %	47.7	7.5	55.2	4.1	0.5	4.6	1.3	38.9	40.2	
Cars +	1761	277	2038	153	19	172	49	1433	1482	3692
% Cars +	99.7	100	99.8	100	100	100	100	99.6	99.6	99.7
Trucks	5	0	5	0	0	0	0	6	6	11
% Trucks	0.3	0	0.2	0	0	0	0	0.4	0.4	0.3

TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Crismark) PM Peak
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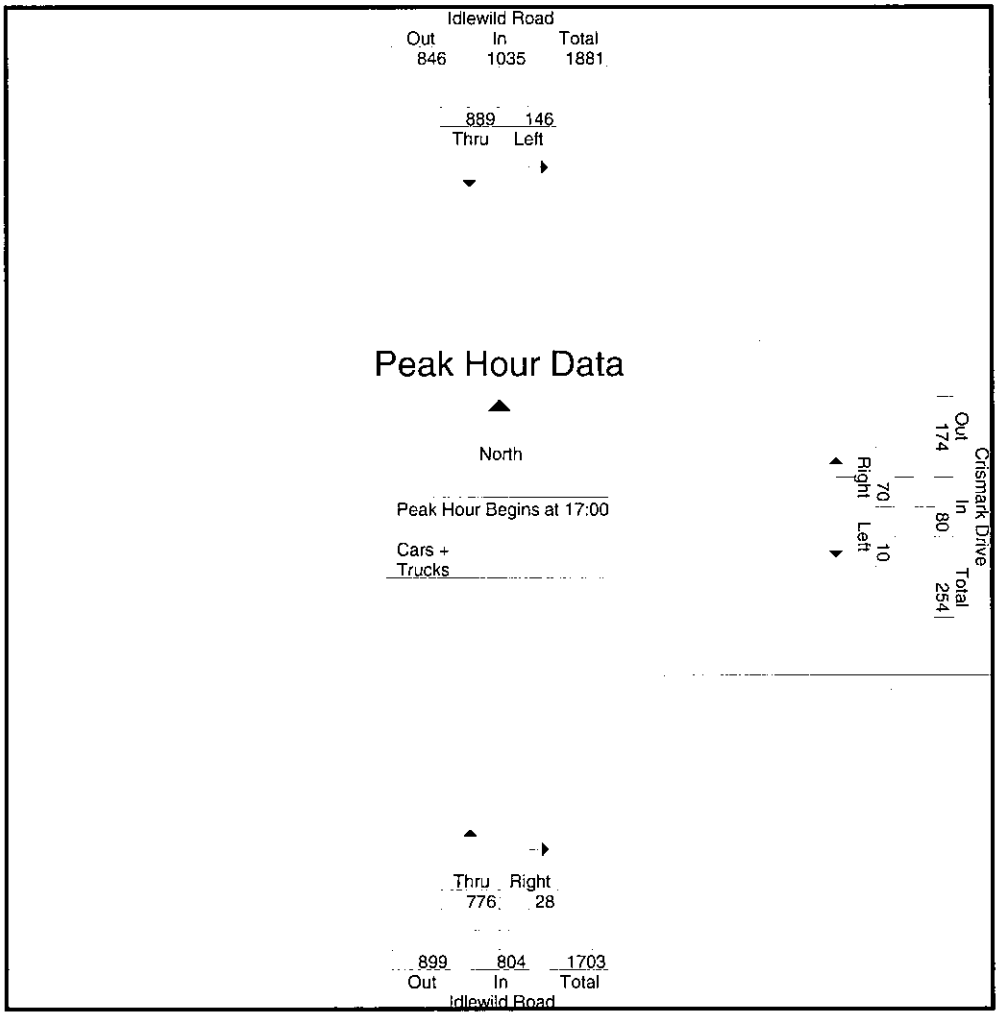
Page No : 2

	Idlewild Road Southbound			Crismark Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 17:00										
17:00	222	**40**	262	9	3	12	4	195	199	473
17:15	205	35	240	23	3	26	8	**209**	**217**	483
17:30	**240**	38	**278**	13	0	13	**10**	196	206	**497**
17:45	222	33	255	**25**	**4**	**29**	6	176	182	466
Total Volume	889	146	1035	70	10	80	28	776	804	1919
% App. Total	85.9	14.1		87.5	12.5		3.5	96.5		
PHF	.926	.913	.931	.700	.625	.690	.700	.928	.926	.965



TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Rockwell) AM Peak
Site Code :
Start Date : 10/2/2018
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Groups Printed- Cars + - Trucks

	Idlewild Road Southbound			Rockwell Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
07:00	118	3	121	31	0	31	0	179	179	331
07:15	130	1	131	27	1	28	0	173	173	332
07:30	129	1	130	24	0	24	2	184	186	340
07:45	127	2	129	20	0	20	0	154	154	303
Total	504	7	511	102	1	103	2	690	692	1306
08:00	91	2	93	14	0	14	1	168	169	276
08:15	99	3	102	11	0	11	0	203	203	316
08:30	117	1	118	12	1	13	0	148	148	279
08:45	104	1	105	6	0	6	0	174	174	285
Total	411	7	418	43	1	44	1	693	694	1156
Grand Total	915	14	929	145	2	147	3	1383	1386	2462
Apprch %	98.5	1.5		98.6	1.4		0.2	99.8		
Total %	37.2	0.6	37.7	5.9	0.1	6	0.1	56.2	56.3	
Cars +	902	14	916	145	2	147	3	1374	1377	2440
% Cars +	98.6	100	98.6	100	100	100	100	99.3	99.4	99.1
Trucks	13	0	13	0	0	0	0	9	9	22
% Trucks	1.4	0	1.4	0	0	0	0	0.7	0.6	0.9

TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Rockwell) AM Peak
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Start Date : 10/2/2018
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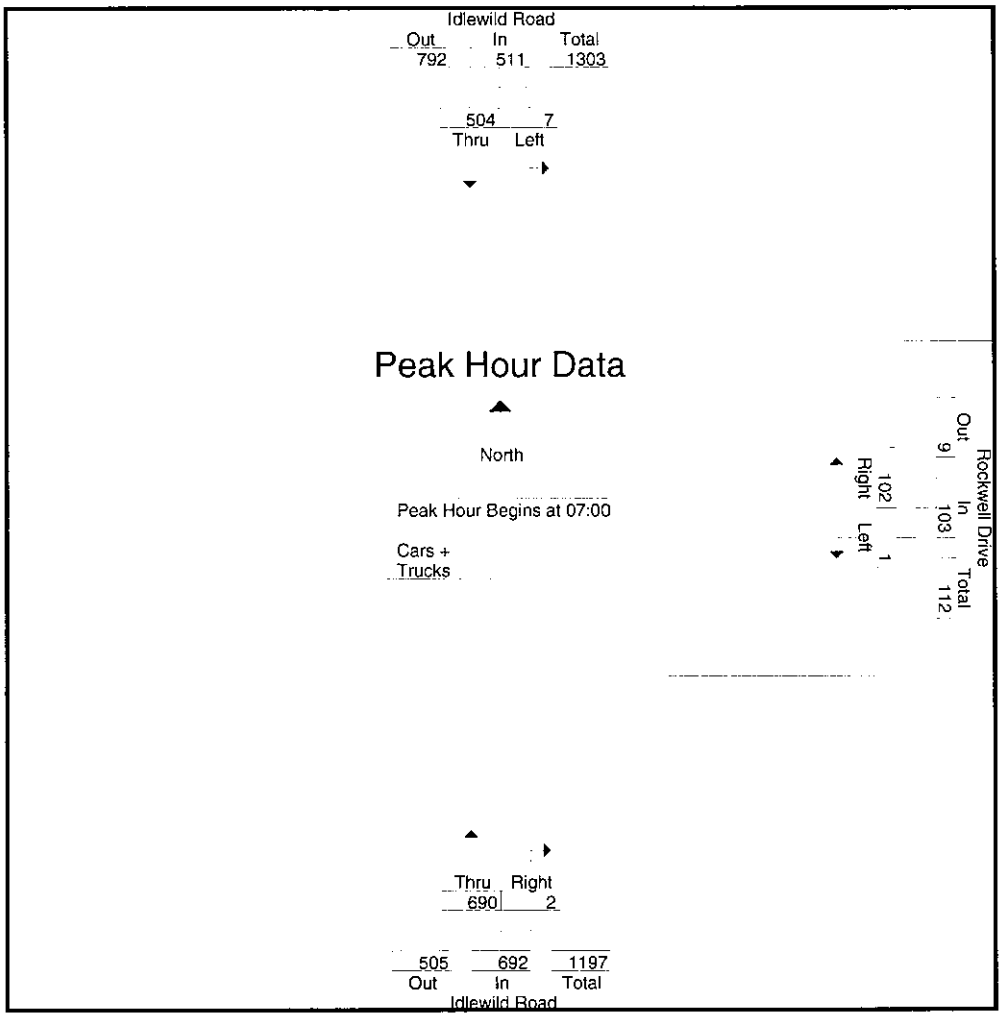
	Idlewild Road Southbound			Rockwell Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00										
07:00	118	**3**	121	**31**	0	**31**	0	179	179	331
07:15	**130**	1	**131**	27	**1**	28	0	173	173	332
07:30	129	1	130	24	0	24	**2**	**184**	**186**	**340**
07:45	127	2	129	20	0	20	0	154	154	303
Total Volume	504	7	511	102	1	103	2	690	692	1306
% App. Total	98.6	1.4		99	1		0.3	99.7		
PHF	.969	.583	.975	.823	.250	.831	.250	.938	.930	.960



TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Rockwell) PM Peak
Site Code :
Start Date : 10/2/2018
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Groups Printed- Cars + - Trucks

	Idlewild Road Southbound			Rockwell Drive Westbound			Idlewild Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
16:00	207	15	222	6	0	6	3	168	171	399
16:15	204	10	214	4	0	4	2	174	176	394
16:30	224	20	244	5	0	5	2	149	151	400
16:45	204	20	224	2	1	3	2	175	177	404
Total	839	65	904	17	1	18	9	666	675	1597
17:00	216	19	235	7	1	8	0	186	186	429
17:15	208	12	220	9	0	9	0	199	199	428
17:30	201	31	232	11	0	11	1	193	194	437
17:45	215	20	235	11	2	13	1	171	172	420
Total	840	82	922	38	3	41	2	749	751	1714
Grand Total	1679	147	1826	55	4	59	11	1415	1426	3311
Apprch %	91.9	8.1		93.2	6.8		0.8	99.2		
Total %	50.7	4.4	55.1	1.7	0.1	1.8	0.3	42.7	43.1	
Cars +	1673	147	1820	55	4	59	11	1406	1417	3296
% Cars +	99.6	100	99.7	100	100	100	100	99.4	99.4	99.5
Trucks	6	0	6	0	0	0	0	9	9	15
% Trucks	0.4	0	0.3	0	0	0	0	0.6	0.6	0.5

TRAFFIC DATA COLLECTION

File Name : Matthews(Idlewild and Rockwell) PM Peak
Site Code :
Start Date : 10/2/2018
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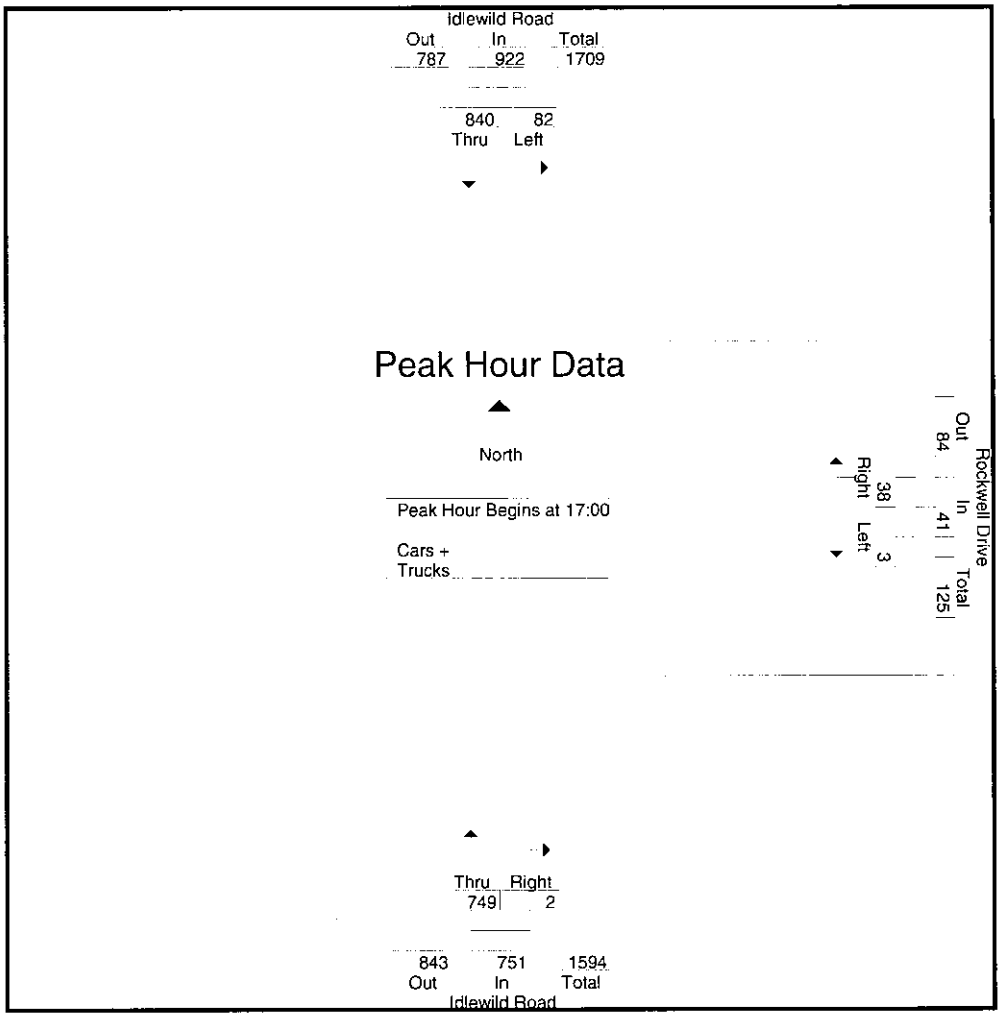
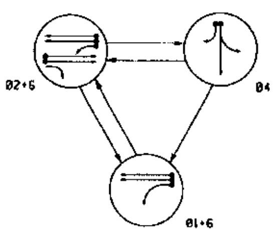
	Idlewild Road Southbound			Rockwell Drive Westbound				Idlewild Road Northbound		
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 17:00										
17:00	**216**	19	**235**	7	1	8	0	186	186	429
17:15	208	12	220	9	0	9	0	**199**	**199**	428
17:30	201	**31**	232	**11**	0	11	**1**	193	194	**437**
17:45	215	20	235	11	**2**	**13**	1	171	172	420
Total Volume	840	82	922	38	3	41	2	749	751	1714
% App. Total	91.1	8.9		92.7	7.3		0.3	99.7		
PHF	.972	.661	.981	.864	.375	.788	.500	.941	.943	.981



APPENDIX C

SIGNAL DATA

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø4	FLASH
11	-	[flashing yellow arrow]	←	←Y ▽
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y

[flashing yellow arrow] = Flashing Yellow Arrow

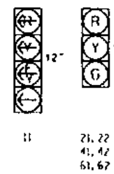
STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

FROM	TO ← 1	TO ← 2	TO [flashing yellow arrow] 1	TO [flashing yellow arrow] 2	TO ←Y 1	TO ←Y 2
←	[symbol]	[symbol]	[symbol]	[symbol]	[symbol]	[symbol]
[flashing yellow arrow]	[symbol]	[symbol]	[symbol]	[symbol]	[symbol]	[symbol]
←Y	[symbol]	[symbol]	[symbol]	[symbol]	[symbol]	[symbol]

[flashing yellow arrow] = Flashing Yellow Arrow

SIGNAL FACE I.D.

All Heads L.E.D.



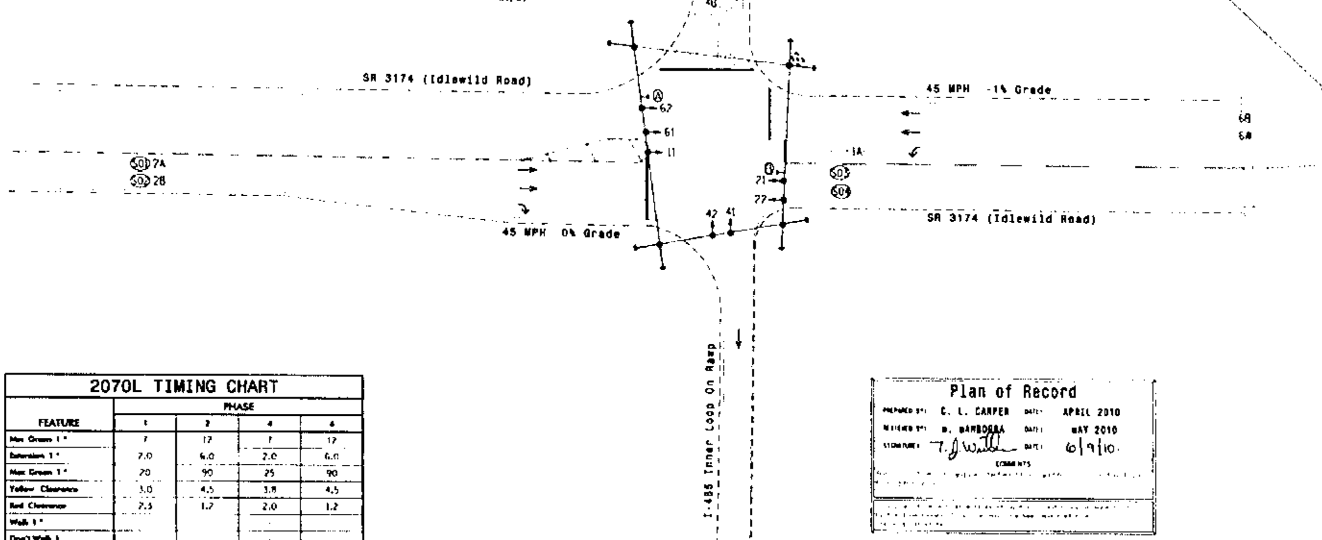
2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-		15	-	-
					6	Y	Y	Y		5	-	-
2A/501	6X6	300	5		2	Y	Y			-	Y	-
2B/502	6X6	300	5	-	2	Y	Y	-		-	Y	-
4A	6X40	0	2-4-2	-	4	Y	Y	-		-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-		15	-	-
6A	6X6	290	4		6	Y	Y	-				
6B	6X6	290	4	-	6	Y	Y	-		-	-	
503	6X6	+110	3	-	-	-	-	-		-	Y	
504	6X6	+110	3								Y	

3 Phase
Fully Actuated
SR 3174/1501 (Idlewild Road) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset #2050.



2070L TIMING CHART

FEATURE	PHASE 1	2	4	6
Min Green 1 *	7	17	7	17
Extension 1 *	2.0	6.0	2.0	6.0
Max Green 1 *	20	90	25	90
Yellow Clearance	3.0	4.5	3.8	4.5
Red Clearance	2.3	1.7	2.0	1.2
Walk 1 *			-	
Don't Walk 1			-	
Seconds Per Actuation *		1.5 ▽		1.5
Max Variable Initial *		34		33
Time Before Reduction *	-	15		15
Time To Reduce *	-	30		2.0
Minimum Gap	-	3.0		3.0
Recall Mode		MIN RECALL	-	MIN RECALL
Vehicle Call Memory		YELLOW	-	YELLOW
Dual Entry				-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Plan of Record

PREPARED BY: C. L. CARPER	DATE: APRIL 2010
REVIEWED BY: B. BARBOUR	DATE: MAY 2010
SIGNATURE: [signature]	DATE: 6/9/10

COMMENTS

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Pavement Marking Arrow	
	No Right Turn Sign (R3-1)	
	No Left Turn Sign (R3-2)	

Plan of Record

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24393 TIMOTHY J. WILLIAMS

[signature] 6/9/10
SIGNATURE DATE

Prepared in the Offices of: Signal Design Section

SCALE 0 40 1"=40'

SR 3174 (Idlewild Road) at I-485 Inner Loop Ramps

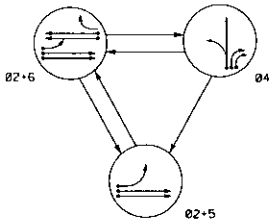
Division 10 Mecklenburg County Stallings

PLAN DATE: February 2009 REVIEWED BY: B.Barbour
PREPARED BY: MKB REVISED BY:

REVISIONS INIT. DATE
▽ Revise flash display for head #11 & Volume density timing for phase 2 [initials] 6/9/10

PROJECT REFERENC
P0R

PHASING DIAGRAM



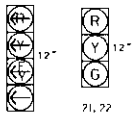
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø5+Ø6	Ø2+Ø6	Ø4	FLASH
21,22	G	G	R	Y
41,42,43	R	R	G	R
43	R	R	G	R
51	←	↓	R	Y
61, 62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS						DETECTOR PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	PULSE TIME DELAY	STRETCH TIME	DELAY TIME	SYSTM LOOP	NEW CARD
2A	*	300	*	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2		4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2		4	Y	Y	-	-	15	-	-
4C	6X40	0	2-4-2		4	Y	Y	-	-	15	-	-
5A	6X60	0	2-4-2		5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A/SO5	6X6	300	4	-	6	Y	Y	-	-	-	Y	-
6B/SO6	6X6	300	4	-	6	Y	Y	-	-	-	Y	-
SO7	6X6	+75	3	-	-	-	-	-	-	-	Y	-
SO8	6X6	+75	3	-	-	-	-	-	-	-	Y	-

* Microwave Detector

3 Phase
Fully Actuated
SR 3174/1501 (Idlewild Rd.) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated Janua 2012 and "Standard Specifications for Roads an Structures" dated January 2
2. Do not program signal for night flashing operation unless otherwise directed b the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Pavement markings are exist
6. Maximum times shown in timi chart are for free-run operation only. Coordinate signal system timing values supersede these values.
7. Closed loop system data: Master Asset # 11024. Controller Asset # 1768.

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	1.0	1.0	6.0
Max Green 1 *	90	25	25	90
Yellow Clearance	4.5	3.7	3.0	4.5
Red Clearance	1.2	1.6	2.4	1.2
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	2.0	-	-	1.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduction *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds

LEGEND

PROPOSED

- Traffic Signal Head
- Modified Signal Head
- Sign
- Pedestrian Signal Head With Push Button & Sign
- Signal Pole with Guy
- Signal Pole with Sidewalk Guy
- Inductive Loop Detector
- Microwave Detector
- Controller & Cabinet
- Pull Box
- 2-in Underground Conduit
- Right of Way with Marker
- Directional Arrow
- Pavement Marking Arrow
- Master Controller & Cabinet
- Microwave Detection Zone
- (A) No Right Turn Sign (R3-1)
- (B) No Left Turn Sign (R3-2)
- (C) Combined Through and Left Arrow Sign (R3-6L)
- (D) Right Arrow "ONLY" Sign (R3-5R)

Plan of Record

PREPARED BY: C. Pierce DATE: August 2017
REVIEWED BY: T. J. Williams DATE: August 2017
SIGNATURE: DATE: 8/21/2017
ENTS
Added a second right turn lane on the ramp.

Plan of Record

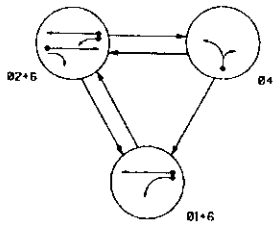
Prepared in the Offices of:

SR 3174 (Idlewild Rd.)
at
I-485 Outer Loop Ramps

Division 10 Mecklenburg County Stallings
PLAN DATE: February 2009 REVIEWED BY: M. Wahbooba
PREPARED BY: NKM REVIEWED BY:
REVISIONS

SCALE
0 30
1"=30'

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø4	Ø5+Ø7+Ø8
11	←	↓	↓	↓
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y

↓ = Flashing Yellow Arrow

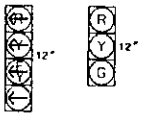
STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

	11					
	←		↓		↓	
	1	2	1	2	1	2
FROM ←	↓	↓	↓	↓	↓	↓
FROM ↓	↓	↓	↓	↓	↓	↓
FROM ↓	↓	↓	↓	↓	↓	↓

↓ = Flashing Yellow Arrow

SIGNAL FACE I.D.

All Heads L.E.D.



11

21, 22
41, 42
61, 62

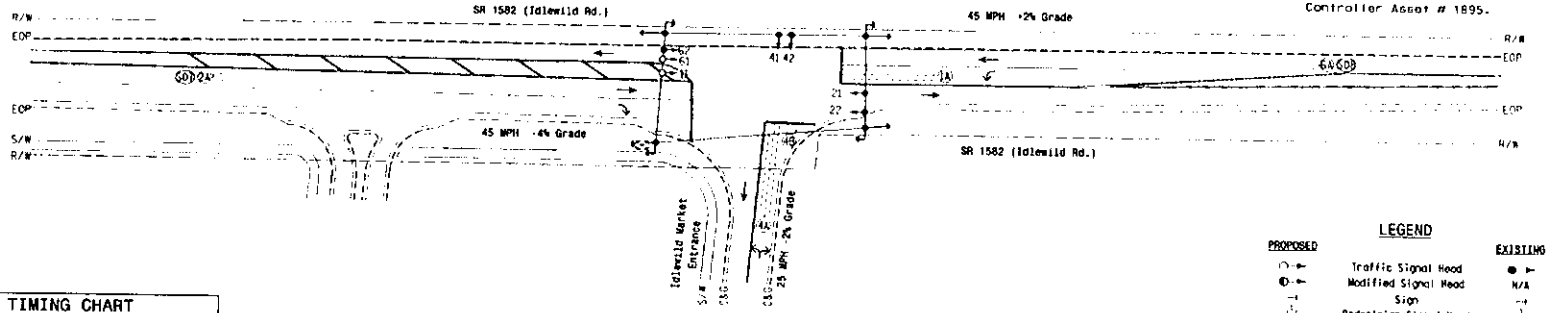
2070L LOOP & DETECTOR INSTALLATION

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	SLOPE	DETECTOR PROGRAMMING PHASE	CALLING	EXTENSION	PULSE DELAY	STRETCH TIME	DELAY TIME	LOCK ON	CALL ON
1A	6X60	0	7-4-2	-	1	Y	Y		-	15		
					6	Y	Y	Y	-	3		
2A/SO7	6X6	300	5	-	2	Y	Y	-	-	-	Y	-
4A	6X60	0	7-4-2	-	4	Y	Y	-	-	5	-	-
4B	6X6	0	5	-	4	Y	Y	-	-	10	-	-
6A/SO8	6X6	300	5	-	6	Y	Y	-	-	-	Y	-

3 Phase
Fully Actuatted
SR 3174/1501 (Idlewild Rd) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition signal head numbered 62.
5. Set all detector units to presence mode.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed loop system data: Controller Asset # 1895.



2070L TIMING CHART

FEATURE	PHASE 1	2	4	6
Min Green 1 *	7	12	7	12
Extension 1 *	3.0	6.0	1.0	6.0
Max Green 1 *	15	90	75	90
Yellow Clearance	3.0	4.9	3.0	4.9
Red Clearance	2.3	1.3	1.9	1.3
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	2.5	-	2.5
Max Variable Initial *	-	34	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory		YELLOW		YELLOW
Dual Entry			-	
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Pavement Marking Arrow	

Signal Upgrade Corr. File No. 10-08-208

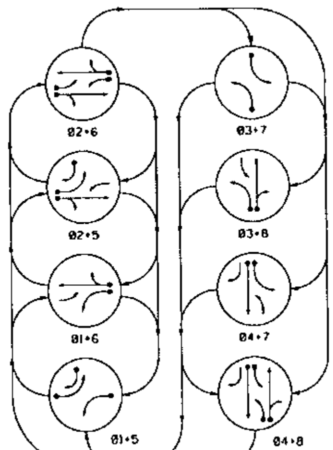
SR 1501 (Idlewild Road)
at
Idlewild Market Entrance

Division 10 Union County Stallings
PLAN DATE: February 2008 REVIEWED BY: M.Mahboobs
PREPARED BY: WAM REVIEWED BY:
REVISIONS DATE

SCALE 1"=40' 0 40

PROJECT REFERENCE
SS 4910B

PHASING DIAGRAM



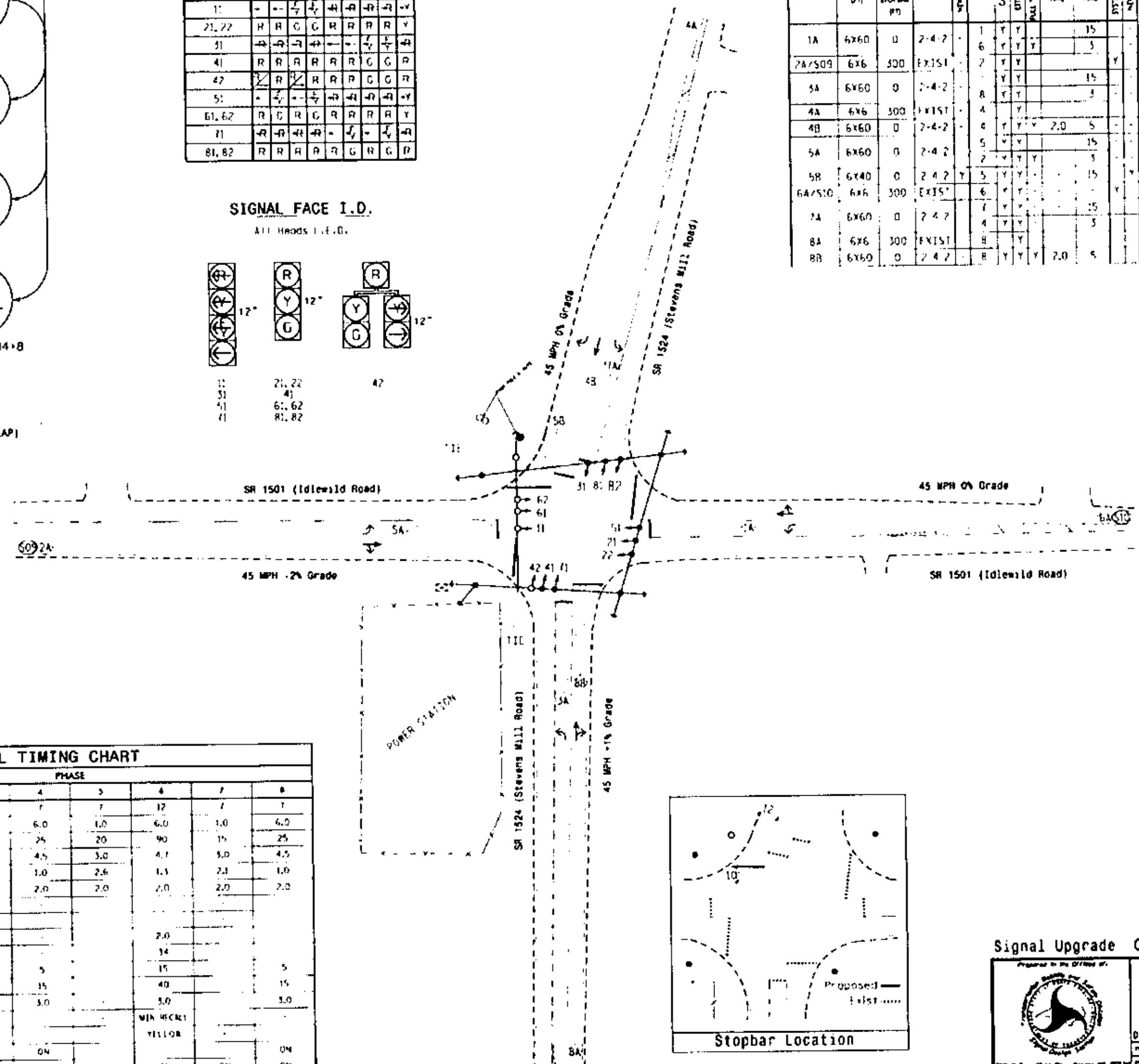
PHASING DIAGRAM DETECTION LEGEND
DETECTED MOVEMENT
UNDETECTED MOVEMENT (OVERLAP)
UNSIGNALIZED MOVEMENT
PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11	←	←- -	←G/Y	←G/Y	←R	←R	←R	←R	←Y
21, 22	R	R	G	G	R	R	R	R	Y
31	←R	←R	←R	←R	←	←- -	←G/Y	←G/Y	←R
41	R	R	R	R	R	R	G	G	R
42	[illegible]	R	[illegible]	R	R	R	G	G	R
51	←	←G/Y	←- -	←G/Y	←R	←R	←R	←R	←Y
61, 62	R	G	R	G	R	R	R	R	Y
71	←R	←R	←R	←R	←	←G/Y	←	←G/Y	←R
81, 82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



Stopbar Location

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Y	Y			15		-
					6	Y	Y	Y		3		-
2A/S09	6X6	300	EXIST	-	2	Y	Y				Y	
3A	6X60	0	2-4-2	-	-	Y	Y			15		-
					8	Y	Y			3	-	
4A	6X6	300	EXIST	-	4		Y					
4B	6X60	0	2-4-2	-	4	Y	Y	Y	2.0	5	-	-
5A	6X60	0	2-4-2		5	Y	Y			15	-	-
					2	Y	Y	Y		3	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15		Y
6A/S10	6X6	300	EXIST		6	Y	Y	-	-	-	Y	
7A	6X60	0	2-4-2		7	Y	Y	-	-	15		
					4	Y	Y	-		3		
8A	6X6	300	EXIST		8		Y					-
8B	6X60	0	2-4-2	-	8	Y	Y	Y	2.0	5		

8 Phase
Fully Actuated
SR 3174/1501 (Idlewild Rd.) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated Janua[ry] 2012 and "Standard Specifications for Roads an[d] Structures" dated January 2[012].
2. Do not program signal for [late] night flashing operation unless otherwise directed b[y] the Engineer.
3. Phase 1 and/or phase 5 may [be] lagged.
4. Phase 3 and/or phase 7 may [be] lagged.
5. Set all detector units to presence mode.
6. Maximum times shown in timi[ng] chart are for free-run operation only. Coordinate[d] signal system timing values supersede these values.
7. Closed loop system data: Controller Asset # 1367.

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	1.0	6.0	1.0	6.0	1.0	6.0	1.0	6.0
Max Green 1 *	15	90	20	25	20	90	15	25
Yellow Clearance	3.0	4.7	3.0	4.5	3.0	4.7	3.0	4.5
Red Clearance	2.8	1.5	2.5	1.0	2.6	1.5	2.1	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *		-	-					
Don't Walk 1		-	-					
Seconds Per Actuation *	-	2.0	-	-		2.0		
Max Variable Initial *	-	34	-	-		34		
Time Before Reduction *	-	15		5		15		5
Time To Reduce *	-	40		15		40		15
Minimum Gap	-	3.0		3.0		3.0		3.0
Recall Mode		MIN RECALL				MIN RECALL		-
Vehicle Call Memory		YELLOW				YELLOW	-	
Dual Entry		-	-	ON				ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Fence	

Signal Upgrade Corr. File No. 10-11-201

Prepared in the Offices of:

0 40
1"=40'

SR 1501 (Idlewild Road)
at
SR 1524 (Stevens Mill Road)

Division 10 Union County Stallings
PLAN DATE: December 2012 REVIEWED BY: B. Mahbooba
PREPARED BY: R. D'Aiuto REVIEWED BY:
REVISIONS