

**AURA CHAPEL HILL
DEVELOPMENT**
TRAFFIC IMPACT STUDY - *DRAFT*



Prepared for:

The Town of Chapel Hill
Public Works Department - Engineering

Prepared by:

VHB Engineering NC, P.C.

*940 Main Campus Drive, Venture 1
Suite 500
Raleigh, NC 27606*

NCBELS License #: C-3750

December 2020



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1

Introduction

Trinsic Residential Group plans to develop a parcel of land in the northeast corner of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) in Chapel Hill, NC (Figure 1). The proposed development will consist of 58 townhomes, 361 mid-rise apartments, a 3,032-square foot small office building, and 8,564 square feet of retail space. The development is expected to be fully constructed and occupied by the end of 2023.

Based on the conceptual site plan (Figure 2), access to the development is proposed via two (2) vehicular access points. The following are the proposed access points:

- › Future Access #1: right-in/right-out only access on Martin Luther King Jr. Boulevard (NC 86), approximately 450-feet north of Estes Drive (SR 1750).
- › Future Access #2: full movement access on Estes Drive (SR 1750), approximately 900-feet east of Martin Luther King Jr. Boulevard (NC 86).

Based on discussions with Town of Chapel Hill staff, the following intersections were included in the study area and analyzed for existing and future conditions, where appropriate:

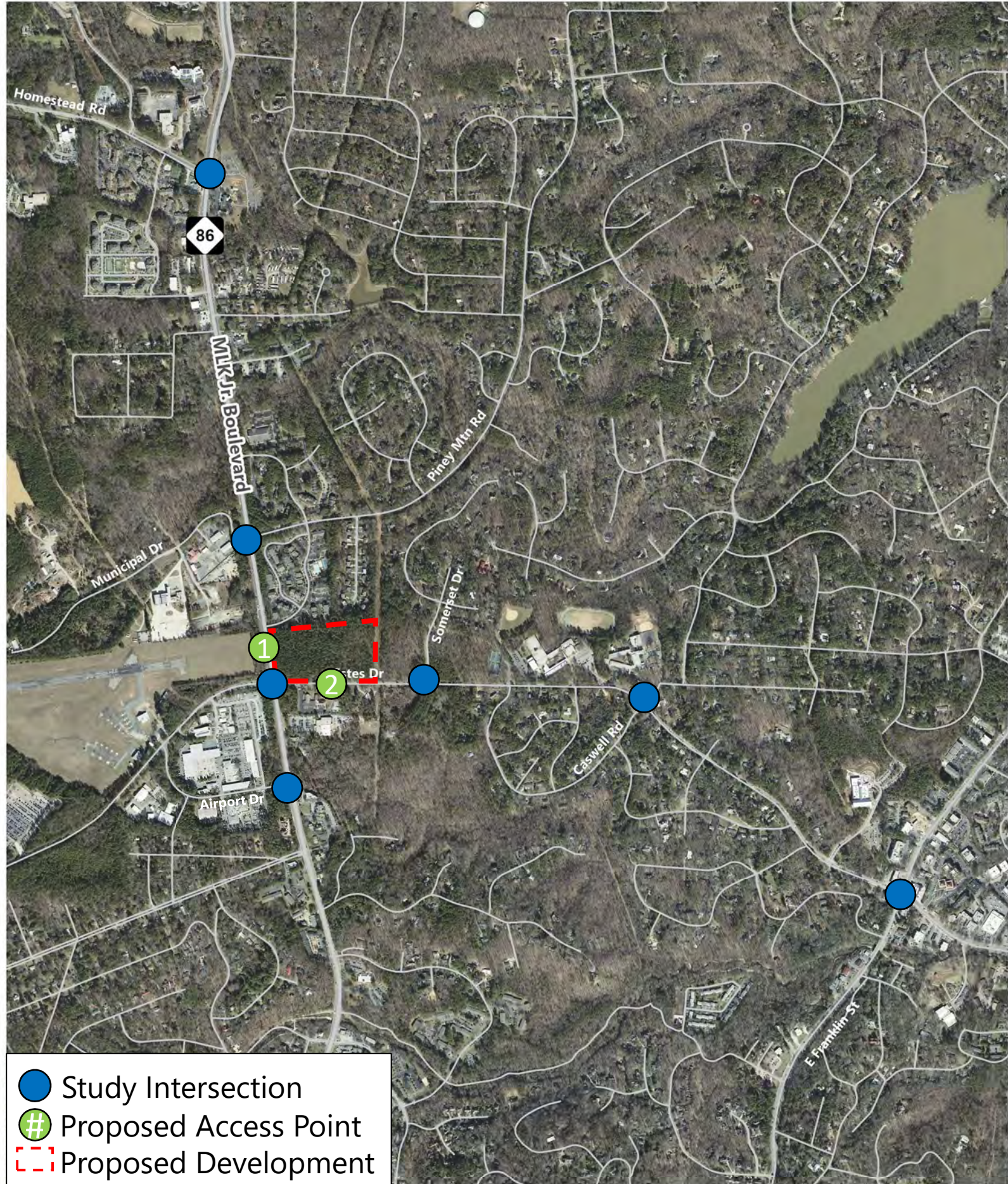
- › Martin Luther King Jr. Boulevard (NC 86) at Airport Drive (unsignalized)
- › Martin Luther King Jr. Boulevard (NC 86) at Estes Drive (SR 1750/SR 1780) (signalized)
- › Martin Luther King Jr. Boulevard (NC 86) at Piney Mountain Road/Municipal Drive (signalized)
- › Martin Luther King Jr. Boulevard (NC 86) at Homestead Road (SR 1777) (signalized)
- › Estes Drive (SR 1750) at Somerset Drive (unsignalized)
- › Estes Drive (SR 1750) at Caswell Road (signalized)

- › Franklin Street (SR 1010) at Estes Drive (SR 1750) (signalized)
- › Martin Luther King Jr. Boulevard (NC 86) at Future Access #1 (future unsignalized)
- › Estes Drive (SR 1750) at Future Access #2 (future unsignalized)

The Town of Chapel Hill requires that future year analysis of the traffic conditions be conducted for the projected build year plus one (+1). Therefore, the analysis was performed under the following four (4) scenarios:

- › Existing (2020) Conditions
- › No-Build (2024) Conditions
- › Build (2024) Conditions
- › Build (2024) Conditions – With Improvements

VHB Engineering NC, P.C. was retained by the Town of Chapel Hill to analyze the potential traffic impacts of the proposed redevelopment and to identify any necessary roadway improvements. This Traffic Impact Analysis (TIA) summarizes trip generation, distribution, traffic assignment, and traffic analyses for the proposed redevelopment. The assumptions agreed upon by the North Carolina Department of Transportation (NCDOT) and the Town of Chapel Hill in order to complete this TIA are outlined in Appendix A.



Project Area

MLK Boulevard TIA

Figure 1
Vicinity Map





2

Existing (2020) Conditions

This section describes the existing roadways in the vicinity of the proposed development. Average annual daily traffic (AADT) data for the surrounding roadway network were obtained from the NCDOT. The most recent AADT counts from the NCDOT are for 2019 on the study area roadways. Table 1 summarizes the functional classification, cross-section, AADT, speeds, presence of sidewalks, and on-street parking status of the primary roads within the study area network.

Martin Luther King Jr. Boulevard (NC 86)

- › Within the study area limits, Martin Luther King Jr. Boulevard (NC 86) is a four-lane undivided roadway with a two-way left-turn lane (TWLTL) and a posted speed limit of 35 miles per hour (mph).
- › The land uses along Martin Luther King Jr. Boulevard (NC 86) are primarily commercial and residential within the study area limits.
- › According to the NCDOT, the 2019 AADT along Martin Luther King Jr. Boulevard (NC 86) was 20,000 vehicles per day (vpd) south of Estes Drive (SR 1750), 27,500 vpd north of Estes Drive (SR 1750), and 25,000 vpd north of Homestead Road (SR 1777).

Estes Drive (SR 1750)

- › Within the study area limits, Estes Drive (SR 1750) is a two-lane undivided roadway with a posted speed limit of 35 mph.
- › The land uses along Estes Drive (SR 1750) are primarily institutional, residential, and commercial within the study area.
- › According to the NCDOT, the 2019 AADT along Estes Drive (SR 1750) was 12,000 vpd west of Martin Luther King Jr. Boulevard (NC 86), 15,000 vpd east of Martin Luther King Jr. Boulevard (NC 86), 15,000 vpd west of Franklin Street (SR 1010), and 15,000 vpd east of Franklin Street (SR 1010).

Franklin Street (SR 1010)

- › Within the study area limits, Franklin Street (SR 1010) is a four-lane undivided roadway with a two-way left-turn lane (TWLTL) and a posted speed limit of 35 mph.
- › The land use along Franklin Street (SR 1010) is primarily commercial within the study area.
- › According to the NCDOT, the 2019 AADT along Franklin Street (SR 1010) was 22,500 vpd north of Estes Drive (SR 1750) and 16,500 south of Estes Drive (SR 1750).

Piney Mountain Road

- › Within the study area limits, Piney Mountain Road is a two-lane undivided roadway with a posted speed limit of 35 mph.
- › The land uses along Piney Mountain Road are primarily residential and institutional within the study area limits.
- › According to the NCDOT, the 2017 AADT along Piney Mountain Road was 3,300 east of Martin Luther King Jr. Boulevard (NC 86).

Homestead Road (SR 1777)

- › Within the study area limits, Homestead Road (SR 1777) is a two-lane undivided roadway with a posted speed limit of 35 mph.
- › The land uses along Homestead Road (SR 1777) are primarily residential within the study area limits.
- › According to the NCDOT, the 2019 AADT along Homestead Road (SR 1777) was 7,200 vpd west of Martin Luther King Jr. Boulevard (NC 86).

Airport Drive

- › Within the study area limits, Airport Drive is a two-lane undivided roadway with no posted speed limit.
- › The land uses along Airport Drive are primarily institutional within the study area.
- › No AADT information was available for Airport Drive.

Table 1 Existing Study Area Roadways

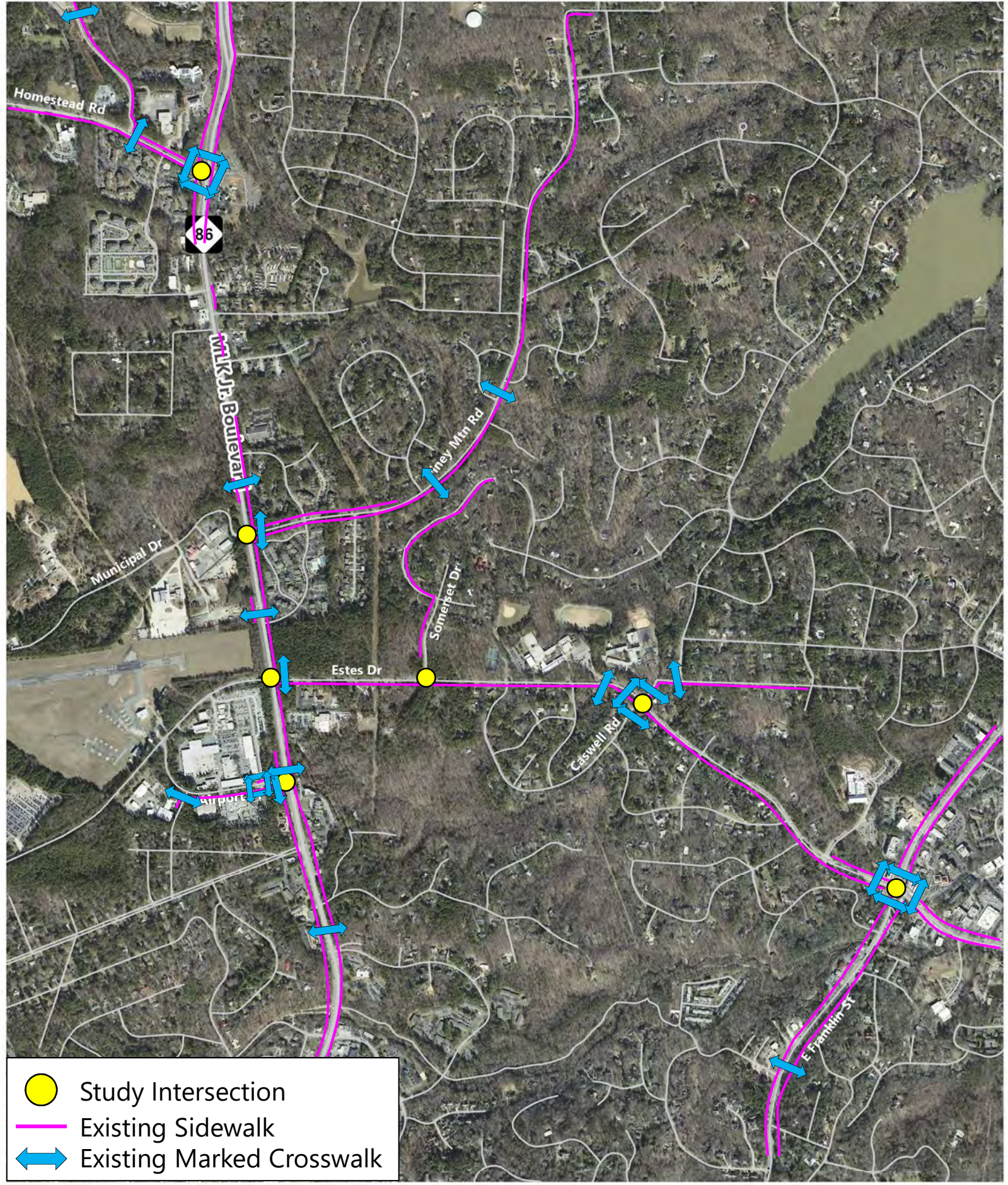
Road Name	Functional Classification*	Study Area Cross-Section	Recent AADT (vpd)	Speed Limit (mph)	Sidewalk (Y/N/S)	On-Street Parking (Y/N/S)
Martin Luther King Jr. Boulevard (NC 86)	Principal Arterial	Four-Lane Undivided; TWLTL	20,000 - 27,500	35	S	N
Estes Drive (SR 1750)	Minor Arterial	Two-Lane Undivided	12,000 - 15,000	35	S	N
Franklin Street (SR 1010)	Principal Arterial	Four-Lane Undivided; TWLTL	16,500 – 22,500	35	Y	N
Piney Mountain Road	Local	Two-Lane Undivided	3,300	35	S	N
Homestead Road (SR 1777)	Minor Arterial	Two-Lane Undivided	7,200	35	Y	N
Airport Drive	Local	Two-Lane Undivided	Not Available	Not Posted	Y	N

S – Some Sidewalk/On-Street Parking Present.

** - NCDOT Urban Functional Classification Map (2018).*

Bicycle Routes and Sidewalks

Bicycle-specific facilities are not present within the study area. Pedestrian facilities are present along some of the study area roadways, but the network of facilities is not complete. Table 1 illustrates the locations of pedestrian and bicycle facilities in the area.



Project Area | **MLK Boulevard TIA**

Figure 3
Existing Pedestrian and
Bicycle Facilities



Intersections

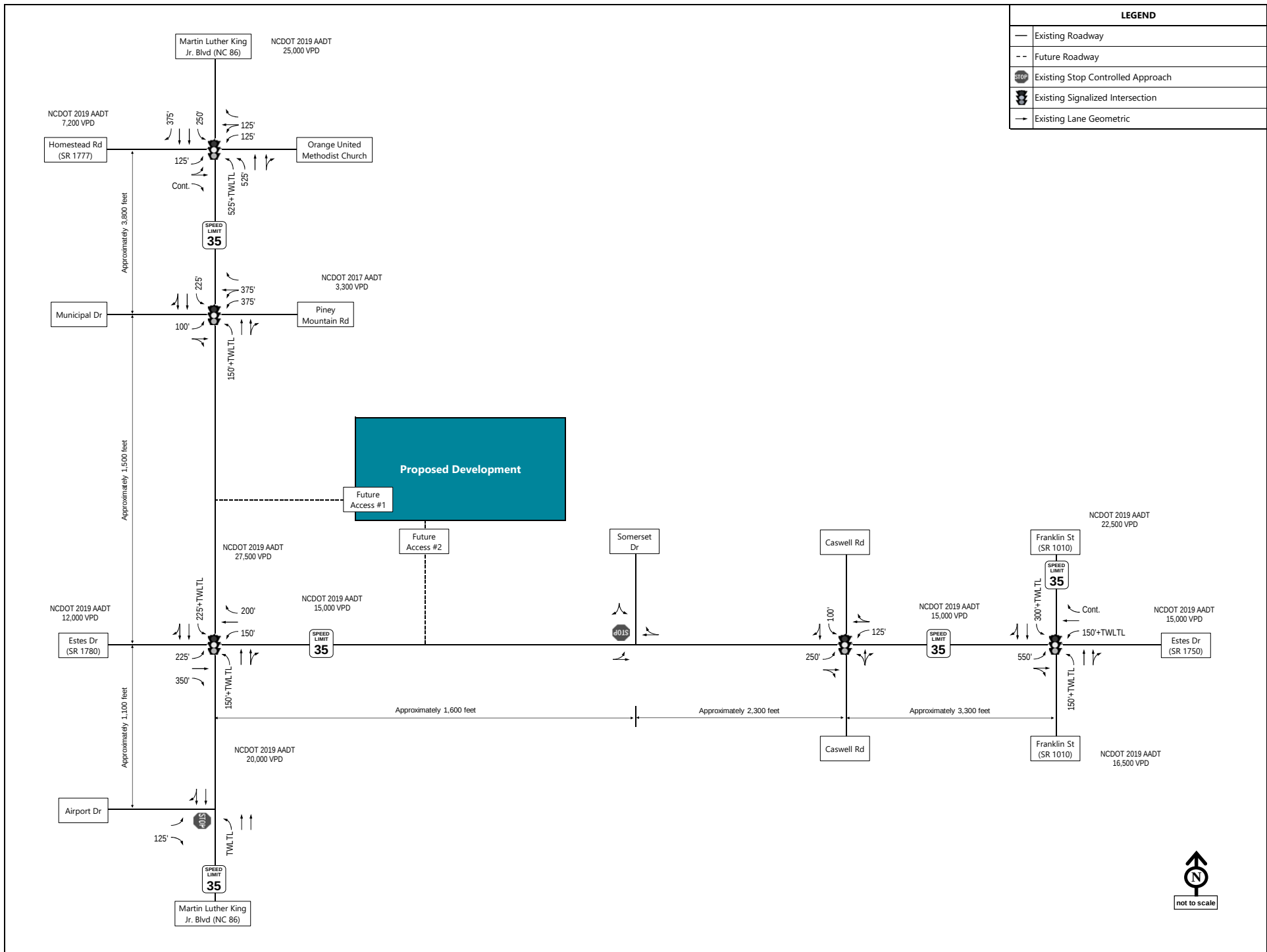
Table 2 shows all study area intersections analyzed for this study. Additionally, the table provides information regarding traffic control and pedestrian amenities at each intersection.

Table 2 Study Intersections

Intersection	Traffic Control	Signal Inv No.	Signal Phases	Signal Operation	Cross-walk	Ped Signals (#)
Martin Luther King Jr. Boulevard (NC 86) at Airport Drive	TWSC ¹	N/A	N/A	N/A	N/A	No
Martin Luther King Jr. Boulevard (NC 86) at Estes Drive (SR 1750/SR 1780)	Signal	07-0532	8	Fully Actuated	NB	Yes (1)
Martin Luther King Jr. Boulevard (NC 86) at Piney Mountain Road	Signal	07-0965	4	Fully Actuated	NB	Yes (1)
Martin Luther King Jr. Boulevard (NC 86) at Homestead Road (SR 1777)	Signal	07-1019	6	Fully Actuated	All Legs	Yes (4)
Estes Drive (SR 1750) at Somerset Drive	TWSC	N/A	N/A	N/A	N/A	No
Estes Drive (SR 1750) at Caswell Road	Signal	07-0219	5	Fully Actuated	SB, EB, WB	Yes (3)
Franklin Street (SR 1010) at Estes Drive (SR 1750)	Signal	07-0527	8	Fully Actuated	All Legs	Yes (4)

¹TWSC – Two-Way Stop Control.

Figure 4 provides a schematic diagram of the existing roadways near the proposed development, including the intersection geometrics.

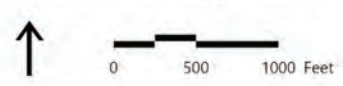
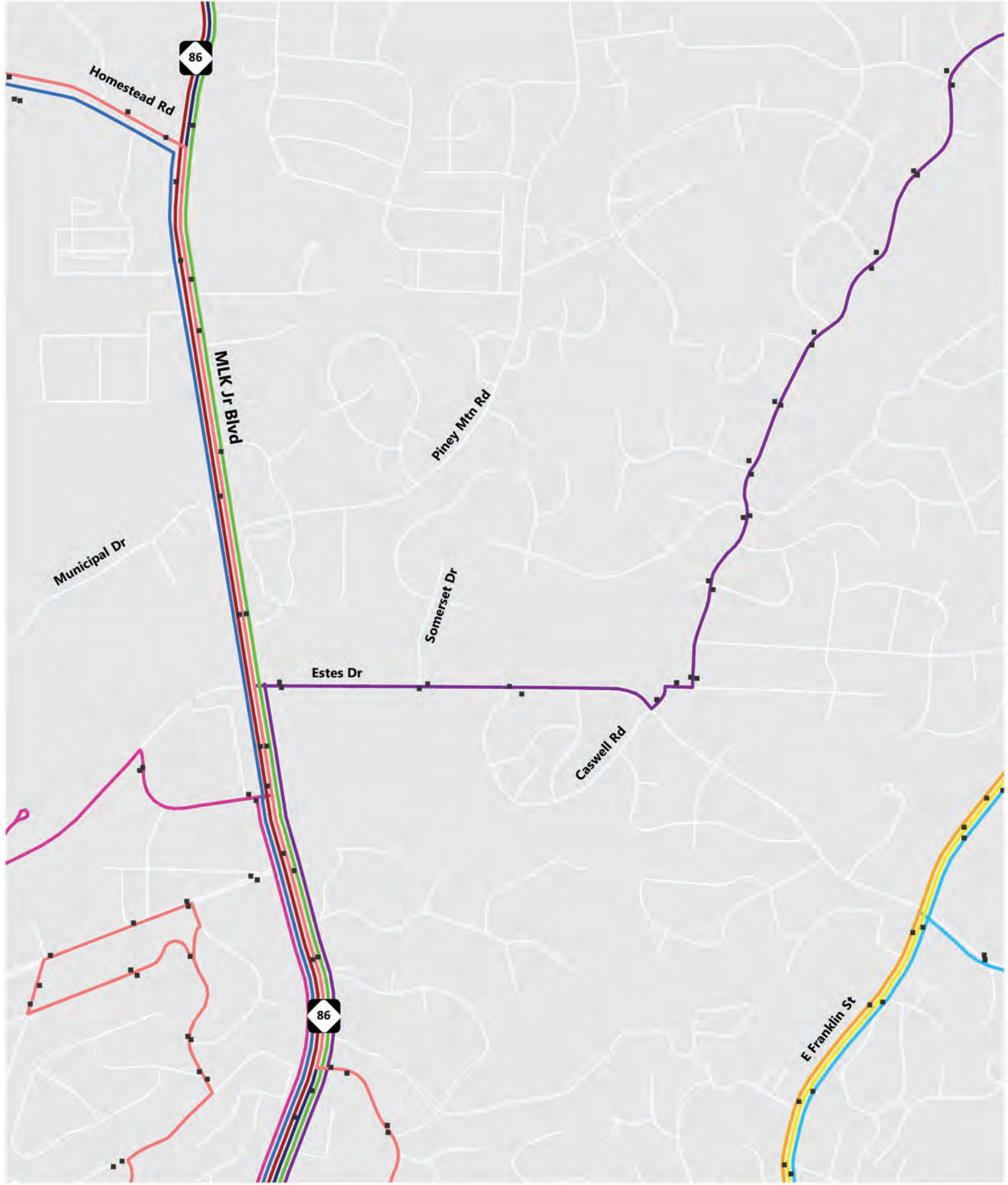


Transit Routes

Transit service data was obtained for the surrounding area in February 2020, before the start of the COVID-19 pandemic. Since this time, adjustments have been made to multiple routes to account for a decrease in ridership that has been observed since March 2020. When local data was collected, Chapel Hill Transit (CHT) had six (6) bus routes through the study area with four (4) bus stops adjacent to the site, and two (2) bus stops near the site. Also, GoTriangle and Piedmont Area Regional Transit (PART) serve the study area with one bus route for each agency. Table 3 and Figure 5 provide additional detail about the area transit service.

Table 3 Adjacent Transit Route Information

Route	Headways (Min)			Study Area Stops	Destinations
	AM Peak	PM Peak	Off-Peak		
A	30	30	60	Martin Luther King Jr. Boulevard (NC 86) at Shadowood Ct (ID: 3327 and 3479) Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3445 and 3053)	UNC Campus, YMCA, Police Department, Town Hall, UNC Hospital
HS	70	70	70	Martin Luther King Jr. Boulevard (NC 86) at Shadowood Ct (ID: 3327 and 3479) Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3445 and 3053)	UNC Campus, YMCA, Chapel Hill High School, UNC Hospital
NS	10	10	20	Martin Luther King Jr. Boulevard (NC 86) at Shadowood Ct (ID: 3327 and 3479) Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3445 and 3053)	UNC Campus, YMCA, Chapel Hill High School, UNC Hospital, Southern Community Park
T	25	25	70	Martin Luther King Jr. Boulevard (NC 86) at Shadowood Ct (ID: 3327 and 3479) Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3445 and 3053)	UNC Campus, YMCA, UNC Hospital, East Chapel Hill High School, Town Hall
T (Saturday)	60	60	70	Martin Luther King Jr. Boulevard (NC 86) at Shadowood Ct (ID: 3327 and 3479) Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3445 and 3053)	UNC Campus, YMCA, UNC Hospital, East Chapel Hill High School, Colonial Heights
T (Safe Ride)	N/A	N/A	30	Martin Luther King Jr. Boulevard (NC 86) at Shadowood Ct (ID: 3327 and 3479) Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3445 and 3053)	UNC Campus, YMCA, Timberlyne Shopping Center
NU	20	20	20	Airport Drive at Martin Luther King Jr. Boulevard (NC 86) (ID: 3054 and 3241)	UNC Campus, YMCA, UNC Hospital, Police Department
NU (Saturday)	N/A	45	45	Airport Drive at Martin Luther King Jr. Boulevard (NC 86) (ID: 3054 and 3241)	UNC Campus, YMCA, UNC Hospital, Police Department
G	45	45	70	Estes Drive (SR 1750) at Methodist Church (ID: 3480 and 3478)	University Place, UNC Hospitals, UNC Campus
420 [GoTriangle]	30	30	N/A	Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3053) Martin Luther King Jr. Boulevard (NC 86) at Airport Drive (ID: 3444)	Hillsborough, UNC Campus, UNC Hospitals
4 [PART]	30	30	N/A	Martin Luther King Jr. Boulevard (NC 86) at YMCA (ID: 3053) Martin Luther King Jr. Boulevard (NC 86) at Airport Drive (ID: 3444)	Greensboro, Alamance, Graham and Mebane Counties, UNC Campus, UNC Hospital



- Transit**
- Bus Stop
 - A
 - CL
 - D
 - F
 - G
 - HS
 - NS
 - NU
 - T
 - TTA 420

Transit Services | **MLK Boulevard TIA**

Figure 5:
Existing Area
Transit Service



Existing Turning Movement Data

VHB Engineering NC, P.C. collected turning movement counts for the study intersections during the AM, Noon, and PM peak hours in January 2020. The turning movement data for the intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) was collected over a continuous 24-hour period. Table 4 summarizes the schedule used to obtain the turning movement data. A detailed summary of all traffic counts can be found in Appendix B.

Table 4 Weekday Peak Hour Turning Movement Count Schedule

Intersection	Time Period	Data Collection Date
Martin Luther King Jr. Boulevard (NC 86) at Airport Drive	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Martin Luther King Jr. Boulevard (NC 86) at Estes Drive (SR 1750/SR 1780)	12:00 AM – 11:59 PM	Tuesday January 28, 2020
Martin Luther King Jr. Boulevard (NC 86) at Piney Mountain Road/Municipal Drive	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Martin Luther King Jr. Boulevard (NC 86) at Homestead Road (SR 1777)	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Estes Drive (SR 1750) at Somerset Drive	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Estes Drive (SR 1750) at Caswell Road	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Franklin Street (SR 1010) at Estes Drive (SR 1750)	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Willow Drive at Harris Teeter Rear Driveway	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020
Willow Drive at University Place/Bank Driveway	7:00 AM – 9:00 AM; 11:00 AM – 1:00 PM; 4:00 PM – 6:00 PM	Tuesday January 28, 2020

The calculated existing peak hour turning movement volumes are shown in Figure 6.

LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

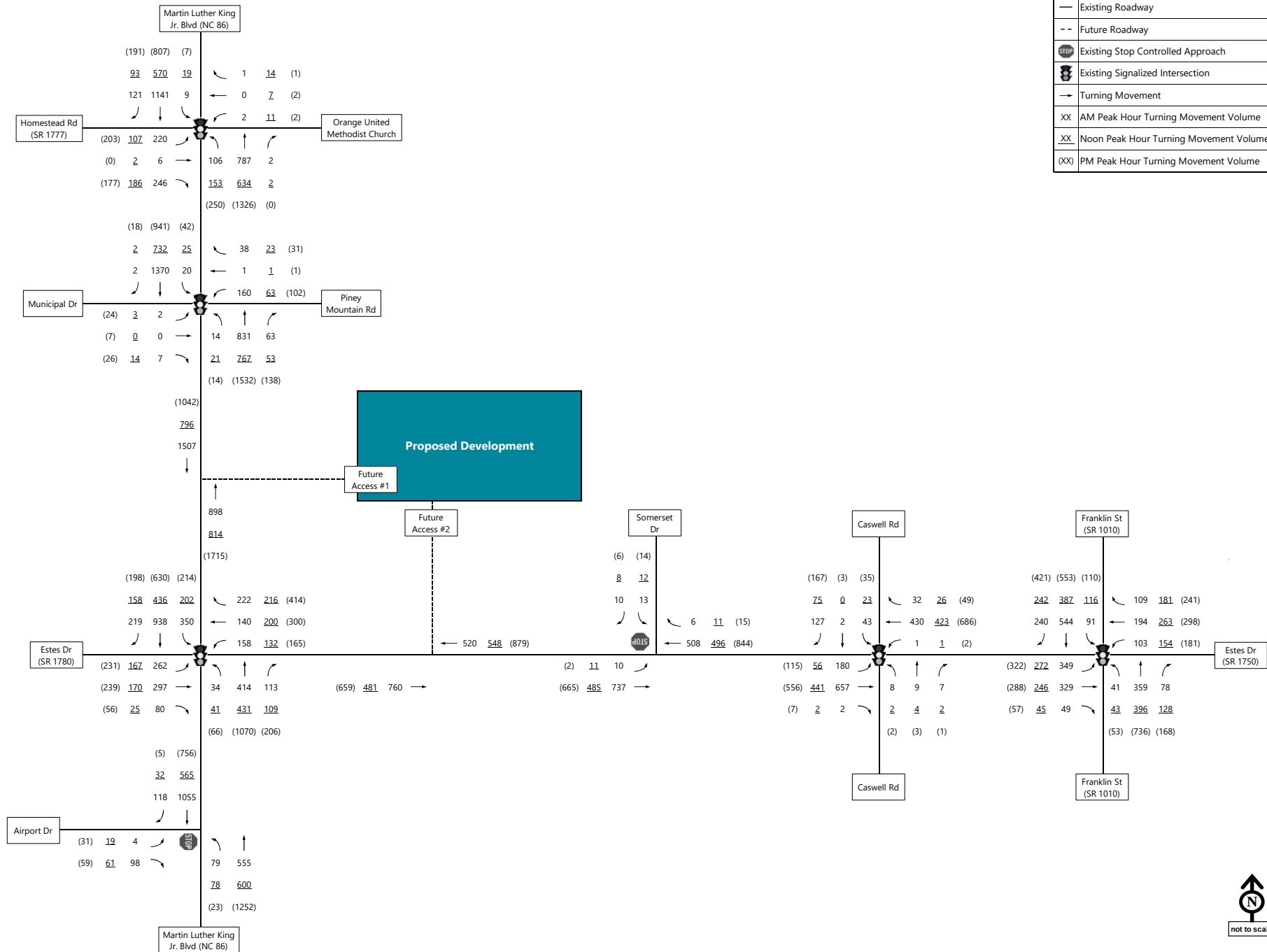


Figure 6
Existing (2020) AM and PM Peak Hour Volumes

Aura Chapel Hill Development
Chapel Hill, NC



Crash Analysis

VHB obtained five-year crash data (February 1, 2015 – January 31, 2020) from the NCDOT Traffic Engineering Accident Analysis System (TEAAS) along Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) adjacent to the site. Note that crashes within the mileposts specified were grouped by intersection (or the closest available landmark). As a result, crashes reported just upstream or downstream of a specific location were grouped inside the intersection itself.

The crash rates for Martin Luther King Jr. Boulevard (NC 86) from Piney Mountain Road to Estes Drive (SR 1750) are reported in Table 5. The total crash rate for the corridor was higher than the statewide crash rate and critical crash rate, as were the non-fatal injury crash and the wet condition crash rates. The night conditions crash rate was higher than the statewide crash rate but lower than the calculated critical crash rate.

Table 6 displays the total number of crashes for each crash type observed along this corridor throughout the study area. The predominant crash type was rear-end crashes (59%), with the next highest being left-turn crashes (20%) and angle crashes (9%).

Table 7 shows the intersection with the highest amount of total crashes (44) over the five-year period was at the signalized intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750).

Table 5 Martin Luther King Jr. Boulevard (NC 86) from Piney Mountain Road to Estes Drive (SR 1750) (February 1, 2015 – January 31, 2020)

Rate	Crashes	Crashes per 100 MVM	Statewide Crash Rate	Critical Crash Rate
Total	70	439.70	299.06	373.50
Fatal	0	0.00	1.39	9.39
Non-Fatal Injury	23	144.47	83.67	124.52
Night	13	81.66	58.08	92.64
Wet	15	94.22	44.6	75.27

**2015-2017 statewide crash rate for urban 4-lane undivided secondary routes*

Table 6 Crash Type Summary (Martin Luther King Jr. Boulevard [NC 86])

Crash Type	Crashes	%
Angle	6	9%
Head On	2	3%
Left Turn	14	20%
Other	2	3%
Pedalcyclist	0	0%
Pedestrian	1	1%
Ran Off Road	3	4%
Rear End	41	59%
Right Turn	1	1%
Sideswipe	0	0%

Table 7 Crashes by Location (Martin Luther King Jr. Boulevard [NC 86])

Intersection/Location	From Milepost	To Milepost	Angle	Head On	Left Turn	Rear End	Right Turn	Sideswipe	Other	Total
Martin Luther King Jr. Boulevard (NC 86) at Estes Drive (SR 1750)	3.06	3.11	5	2	13	20	1	0	3	44
Martin Luther King Jr. Boulevard (NC 86) at Shadowood Drive	3.16	3.16	0	0	0	1	0	0	1	2
Martin Luther King Jr. Boulevard (NC 86) at Pedestrian Crossing	3.22	3.24	0	0	0	14	0	0	2	16
Martin Luther King Jr. Boulevard (NC 86)	3.3	3.3	0	0	0	1	0	0	0	1
Martin Luther King Jr. Boulevard (NC 86) @ Piney Mountain Road	3.34	3.37	1	0	1	5	0	0	0	7

The crash rates for Estes Drive (SR 1750) from Martin Luther King Jr. Boulevard (NC 86) to Caswell Road are reported in Table 8. The total crash rate for the corridor was higher than the statewide crash rate and critical crash rate, as were the non-fatal injury crash and the night conditions crash rates. The wet conditions crash rate was higher than the statewide crash rate but lower than the calculated critical crash rate.

Table 9 displays the total number of crashes for each crash type observed along this corridor throughout the study area. The predominant crash type was rear-end crashes (42%), with the next highest being left-turn crashes (18%) and ran-off-road crashes (11%).

Table 10 shows the intersection with the highest amount of total crashes (33) over the five-year period was at the signalized intersection of Estes Drive (SR 1750) at Martin Luther King Jr. Boulevard (NC 86).

Table 8 Estes Drive (SR 1750) from Martin Luther King Jr. Boulevard (NC 86) to Caswell Road (February 1, 2015 – January 31, 2020)

Rate	Crashes	Crashes per 100 MVM	Statewide Crash Rate	Critical Crash Rate
Total	55	378.01	255.33	327.68
Fatal	0	0.00	1.09	9.03
Non-Fatal Injury	22	151.20	76.91	118.17
Night	17	116.84	66.47	105.07
Wet	9	61.86	41.11	72.20

**2015-2017 statewide crash rate for urban 4-lane undivided secondary routes*

Table 9 Crash Type Summary (Estes Drive [SR 1750])

Crash Type	Crashes	%
Angle	4	7%
Head On	3	5%
Left Turn	10	18%
Other	3	5%
Pedalcyclist	1	2%
Pedestrian	0	0%
Ran Off Road	6	11%
Rear End	23	42%
Right Turn	2	4%
Sideswipe	3	5%

Table 10 Crashes by Location (Estes Drive [SR1750])

Intersection/Location	From Milepost	To Milepost	Angle	Head On	Left Turn	Rear End	Right Turn	Sideswipe	Other	Total
Estes Drive (SR 1750) at Martin Luther King Jr. Boulevard (NC 86)	1.72	1.77	4	2	10	11	1	3	2	33
Estes Drive (SR 1750) at Methodist Church Driveway	1.78	1.82	0	0	0	3	1	0	2	6
Estes Drive (SR 1750) at Driveway	1.89	1.89	0	0	0	0	0	0	1	1
Estes Drive (SR 1750) at Driveway	1.93	1.95	0	1	0	2	0	0	0	3
Estes Drive (SR 1750) at Somerset Drive	1.99	2.03	0	0	0	2	0	0	3	5
Estes Drive (SR 1750) at Driveway	2.11	2.13	0	0	0	1	0	0	1	2
Estes Drive (SR 1750) at Caswell Road	2.16	2.21	0	0	0	4	0	0	1	5

Both crash analysis outputs from TEAAS are attached in Appendix C.

Measure of Effectiveness (MOEs) Descriptions

The *Town of Chapel Hill TIA Guidelines* lists measures of effectiveness that should be reported for traffic impact studies. Table 11 lists the reported measures which include intersection delay, level of service (LOS), and maximum queue lengths within the analysis area. Certain measures are applicable at the intersection level whereas others are corridor or system-wide measures.

Table 11 Summary of Analysis Program Used and MOE Reported

Type	Software	MOE
Intersection	Synchro	Intersection LOS
	Synchro	Intersection Average Delay per Vehicle
	Synchro	Approach Average Delay per Vehicle
	Synchro	Approach LOS
	Synchro	95 th Percentile Queue Length
	SimTraffic	Maximum Observed Queue Length
Roadway Segments	N/A	Daily Volume/Capacity Analysis

Level of Service Criteria

Peak hour LOS measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning volumes. LOS' range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering professional generally accepts LOS D as an acceptable operating condition for signalized intersections in urban areas and LOS C for rural areas.

At unsignalized intersections, LOS E is generally considered acceptable only if the side street encounters the delay. Nevertheless, side streets sometimes function at LOS F during peak traffic periods; however, the traffic volume often does not warrant a traffic signal to assist side street traffic. Table 12 provides a general description of various LOS categories and delay ranges.

Table 12 LOS Description for Intersections

LOS	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

Level of Service Analysis

VHB performed Intersection LOS analyses for the typical weekday AM, Noon, and PM peak hours using *Synchro/SimTraffic Professional Version 10*. Existing signal plans were obtained from the NCDOT online signal plan library and from the Town of Chapel Hill. The traffic signal plans are located in Appendix D. The existing coordinated signal timings along Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) were also obtained from the Town of Chapel Hill and used within the Existing (2020) analysis. A summary of the findings for the Existing (2020) Conditions scenario LOS analysis can be found in Table 13, and the full *Synchro* output can be found in Appendix E.

As reported in Table 13, all signalized intersections, except for one, operate at an overall acceptable LOS (i.e., LOS D or better) during all peak hours. The intersection of Franklin Street (SR 1010) and Estes Drive (SR 1750) operates at LOS E during the PM peak hour. Additionally, all stop-controlled approaches currently operate acceptably during both peak hours.

Table 13 Existing (2020) LOS Results

Intersection and Approach	Traffic Control	Existing (2020)		
		AM	Noon	PM
Martin Luther King Jr. Boulevard (NC 86) and Airport Road	Unsignalized	-	-	-
Eastbound		C-18.0	B-12.8	C-16.4
Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750/SR 1780)	Signalized	D (38.4)	C (32.6)	D (54.2)
Eastbound		E-56.6	D-53.2	E-63.4
Westbound		D-37.0	D-43.5	F-82.3
Northbound		D-42.4	C-25.1	D-52.5
Southbound		C-29.5	C-21.1	C-28.1
Martin Luther King Jr. Boulevard (NC 86) and Piney Mountain Road/Municipal Drive	Signalized	A (8.4)	A (5.4)	B (10.3)
Eastbound		E-61.0	E-59.4	E-71.8
Westbound		E-65.3	E-57.6	E-70.9
Northbound		A-3.9	A-2.5	A-4.2
Southbound		A-3.0	A-1.3	A-8.9
Martin Luther King Jr. Boulevard (NC 86) and Homestead Road (SR 1777)/Church Driveway	Signalized	C (22.6)	C (21.3)	C (20.2)
Eastbound		D-53.1	D-46.3	D-54.8
Westbound		D-51.3	D-45.5	E-58.6
Northbound		B-10.4	B-18.4	B-12.8
Southbound		B-19.9	B-12.6	B-18.6
Estes Drive and Somerset Drive	Unsignalized	-	-	-
Southbound		C-18.2	C-15.4	D-25.8
Estes Drive and Casewell Drive	Signalized	B (13.9)	A (9.7)	B (18.6)
Eastbound		A-6.7	A-3.3	A-6.6
Westbound		B-12.9	A-8.4	B-19.7
Northbound		C-34.5	D-37.0	C-34.2
Southbound		D-48.8	D-46.4	D-54.0
Franklin Street (SR 1010) and Estes Drive (SR 1750)	Signalized	D (48.5)	D (47.9)	E (58.0)
Eastbound		E-66.0	E-55.9	E-67.0
Westbound		D-49.5	D-49.6	E-62.5
Northbound		D-37.3	D-44.2	D-54.2
Southbound		D-39.7	D-43.5	D-52.7

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay.



3

No-Build (2024) Conditions

Background Growth and Development

VHB derived a future growth rate of a half percent (0.5%) from NCDOT-collected average daily traffic counts. This annual growth rate is consistent with recent traffic impact studies near the study area, and it was applied to the existing traffic volumes on all the roadways to account for growth between the base year (2020) and the build year (2024). Town of Chapel Hill staff identified three (3) background developments within the project study area: 1200 MLK Redevelopment, Retirement Residence at Somerset Drive, and University Place Redevelopment. The site trips that are projected to be generated by these developments were used in the No-Build (2024) analysis.

1200 MLK Redevelopment – A new access plan for the 1200 MLK Redevelopment along Martin Luther King Jr. Boulevard (NC 86) was proposed. The project proposes a realignment to the existing access to Northfield Drive to allow direct entering and exiting traffic access to the site. An additional right-in/right-out driveway was proposed to connect to Martin Luther King Jr. Boulevard (NC 86) to the north of the redeveloped site. The development sits north of Taylor Street, and east of Martin Luther King Jr. Boulevard (NC 86). The site has an anticipated build-out year of 2021. The projected site trips from the development were obtained from the traffic impact study (HNTB – June 2019) completed for the development and applied to the roadway network and are depicted in Appendix F.

Retirement Residence at Somerset Drive – The proposed development is under construction and will consist of senior-oriented living spaces. A traffic impact study was not completed for this site because the projected trip generation did not warrant a traffic impact analysis. However, a trip distribution was assumed and used to distribute the projected site trips across the roadway network. The proposed development is located along Somerset Drive, north of Estes Drive (SR 1750). The site has an anticipated build-out year of 2021 and proposes an additional short left-turn lane towards Somerset Drive. The projected site trips from the development were applied to the roadway network and are depicted in Appendix F.

University Place Redevelopment – The proposed redevelopment will consist of hotel rooms, a movie theater, office space, retail and grocery space, a drive-in bank, and a service gas station. The proposed development site is north of Estes Drive (SR 1750), west of Fordham Boulevard (US 15-501), and east of Willow Drive. Phase 1 of the site has an anticipated build-out year of 2024. Noon peak hour analysis was not required for this development; therefore, the noon peak hour site trips were estimated as the average of the AM and PM peak hour volumes. The projected site trips from Phase 1 of the development were applied to the roadway network and are depicted in Appendix F.

Total approved background traffic volumes for the study area are shown in Figure 7, while Figure 8 shows the relative location of the approved background developments.

One (1) background roadway improvement project was identified within the study area. The Estes Drive Extension plans to construct intersection and bicycle/pedestrian improvements at the existing signalized intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750). The committed background improvements from this project, as well as any approved background developments within the study area, were included in the No-Build (2024) analysis.

The No-Build (2024) AM, Noon, and PM peak hour volumes with the background approved development trips are shown in Figure 9. Lane configurations under the No-Build (2024) scenario are shown in Figure 10.

Level of Service Analysis

Intersection LOS analyses were performed for the typical weekday AM, Noon, and PM peak hours using *Synchro/SimTraffic Professional Version 10*. The existing coordinated signal timing splits at the intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) were optimized for this scenario to account for the significant roadway improvement project proposed along Estes Drive (SR 1750). The existing cycle length and offset at this intersection were maintained for the No-Build (2024) scenario. A summary of the findings for the No-Build (2024) scenario LOS analysis can be found in Table 14, and the full *Synchro* output can be found in Appendix E.

As reported in Table 14, the signalized intersection of Franklin Street (SR 1010) and Estes Drive (SR 1750) is expected to continue to operate at LOS E during the PM peak hour. All other signalized intersections are expected to operate acceptably, with slight decreases in delay observed at the intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) due to the background roadway improvements. All stop-controlled approaches within the study area will maintain acceptable operations.

Table 14 No-Build (2024) LOS Results

Intersection and Approach	Traffic Control	No-Build (2024)		
		AM	Noon	PM
Martin Luther King Jr. Boulevard (NC 86) and Airport Road	Unsignalized	-	-	-
Eastbound		C-18.9	B-13.3	C-17.6
Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750/SR 1780)	Signalized	D (35.4)	C (30.1)	D (48.8)
Eastbound		E-57.8	D-43.8	E-64.3
Westbound		D-47.3	D-48.7	E-68.3
Northbound		C-31.1	C-22.8	D-48.4
Southbound		C-23.6	B-16.8	C-25.6
Martin Luther King Jr. Boulevard (NC 86) and Piney Mountain Road/Municipal Drive	Signalized	A (8.6)	A (5.1)	B (10.6)
Eastbound		E-61.0	E-59.4	E-72.0
Westbound		E-65.5	E-57.7	E-71.3
Northbound		A-4.6	A-2.2	A-5.2
Southbound		A-3.0	A-1.5	A-8.3
Martin Luther King Jr. Boulevard (NC 86) and Homestead Road (SR 1777)/Church Driveway	Signalized	C (23.2)	C (21.1)	C (20.6)
Eastbound		D-53.1	D-46.5	D-54.7
Westbound		D-51.3	D-45.5	E-58.6
Northbound		B-11.0	B-18.0	B-13.3
Southbound		C-21.0	B-13.0	B-19.3
Estes Drive and Somerset Drive	Unsignalized	-	-	-
Southbound		C-19.7	C-16.9	D-32.2
Estes Drive and Casewell Drive	Signalized	B (14.3)	A (9.8)	B (19.6)
Eastbound		A-7.1	A-3.6	A-7.3
Westbound		B-13.7	A-8.8	C-21.7
Northbound		C-34.3	D-36.9	C-34.8
Southbound		D-48.9	D-46.6	E-56.8
Franklin Street (SR 1010) and Estes Drive (SR 1750)	Signalized	D (49.8)	D (49.1)	E (64.0)
Eastbound		E-66.1	D-54.6	E-69.2
Westbound		D-47.1	D-47.7	E-68.6
Northbound		D-39.2	D-48.0	E-63.0
Southbound		D-43.0	D-46.7	E-58.2

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay.

LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

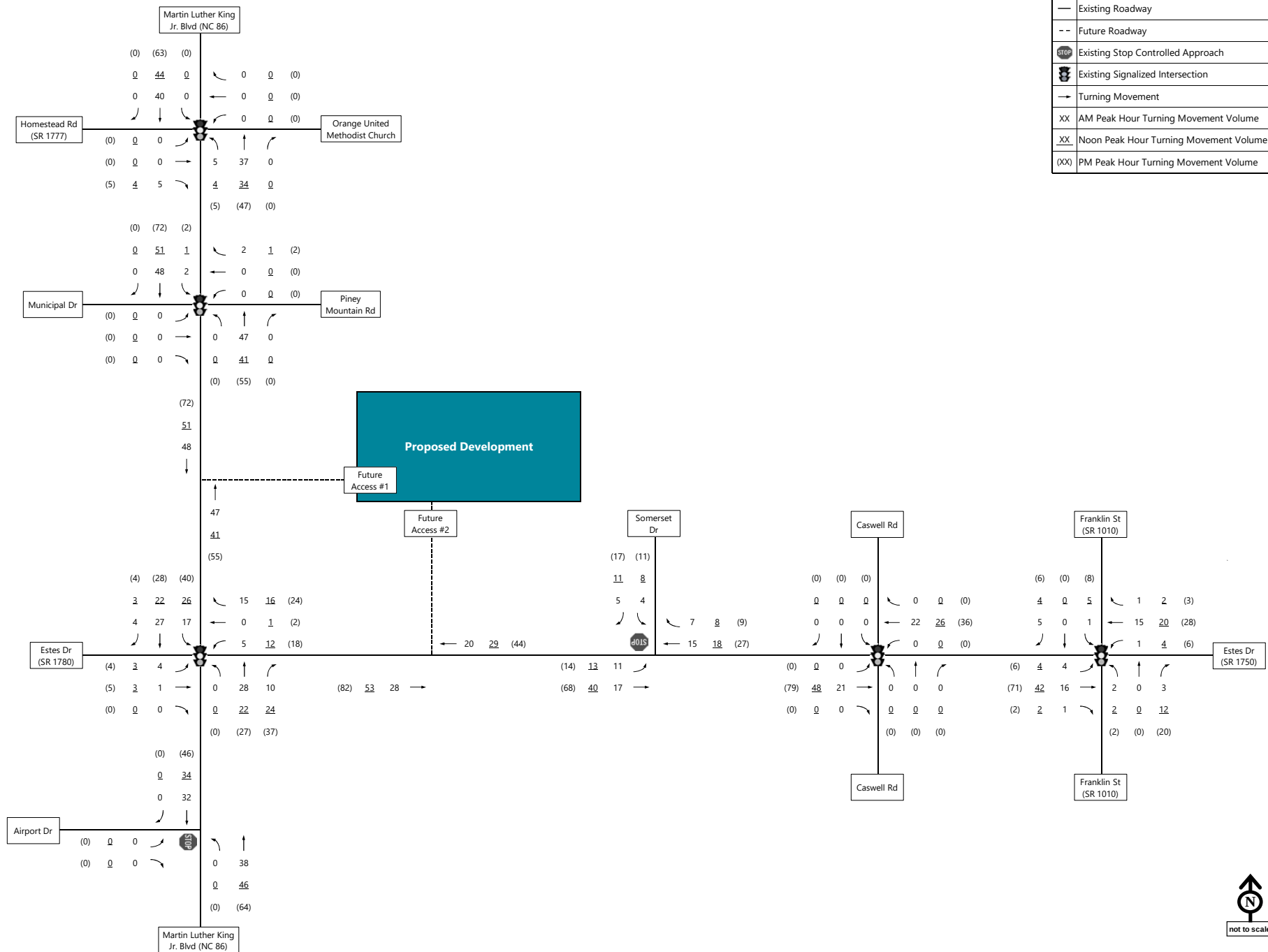
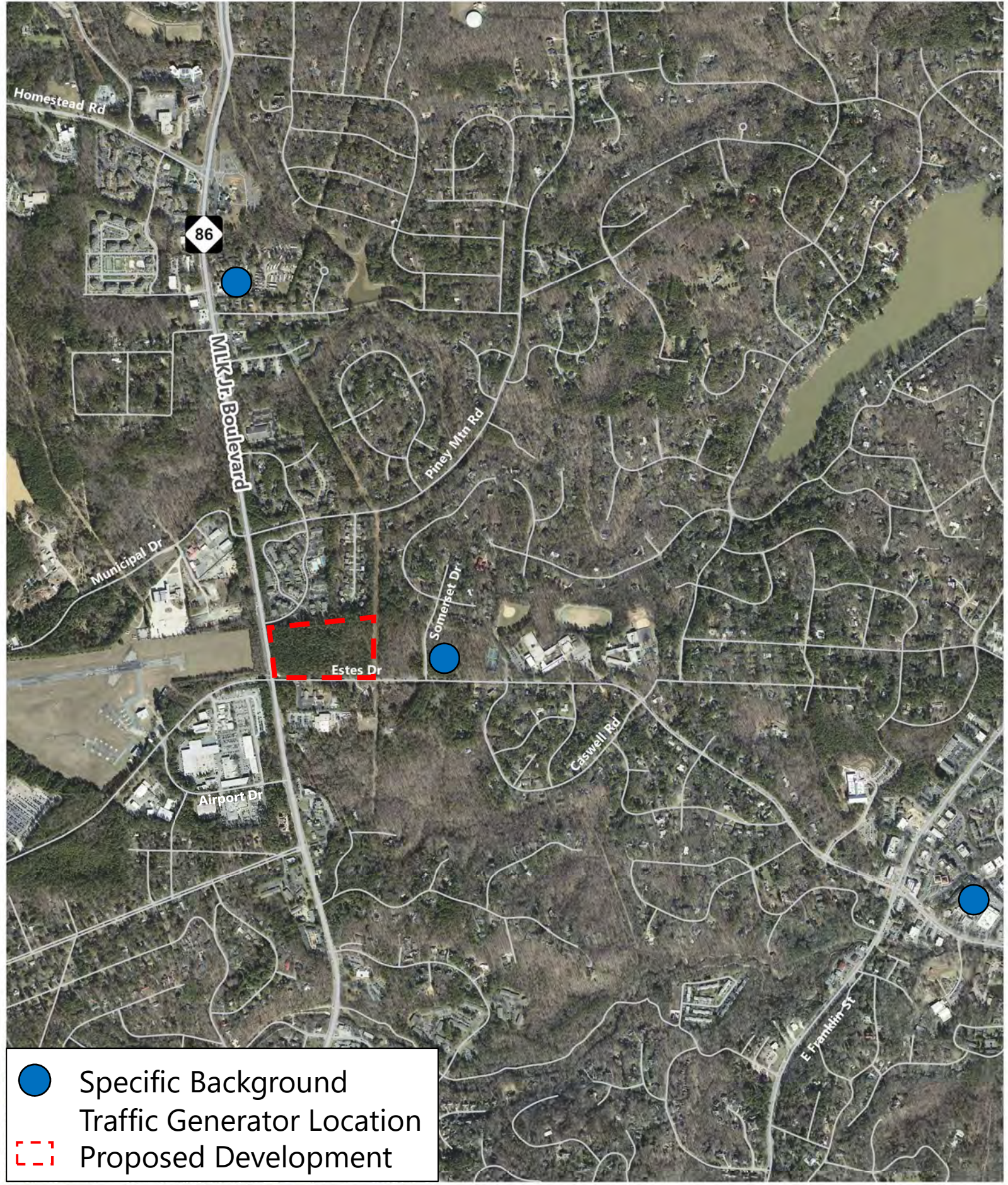


Figure 7
Total Approved Background Generated Peak Hour Site Trips

Aura Chapel Hill Development
Chapel Hill, NC





Project Area

MLK Boulevard TIA

Figure 8
Background Traffic Generator
Locations

LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

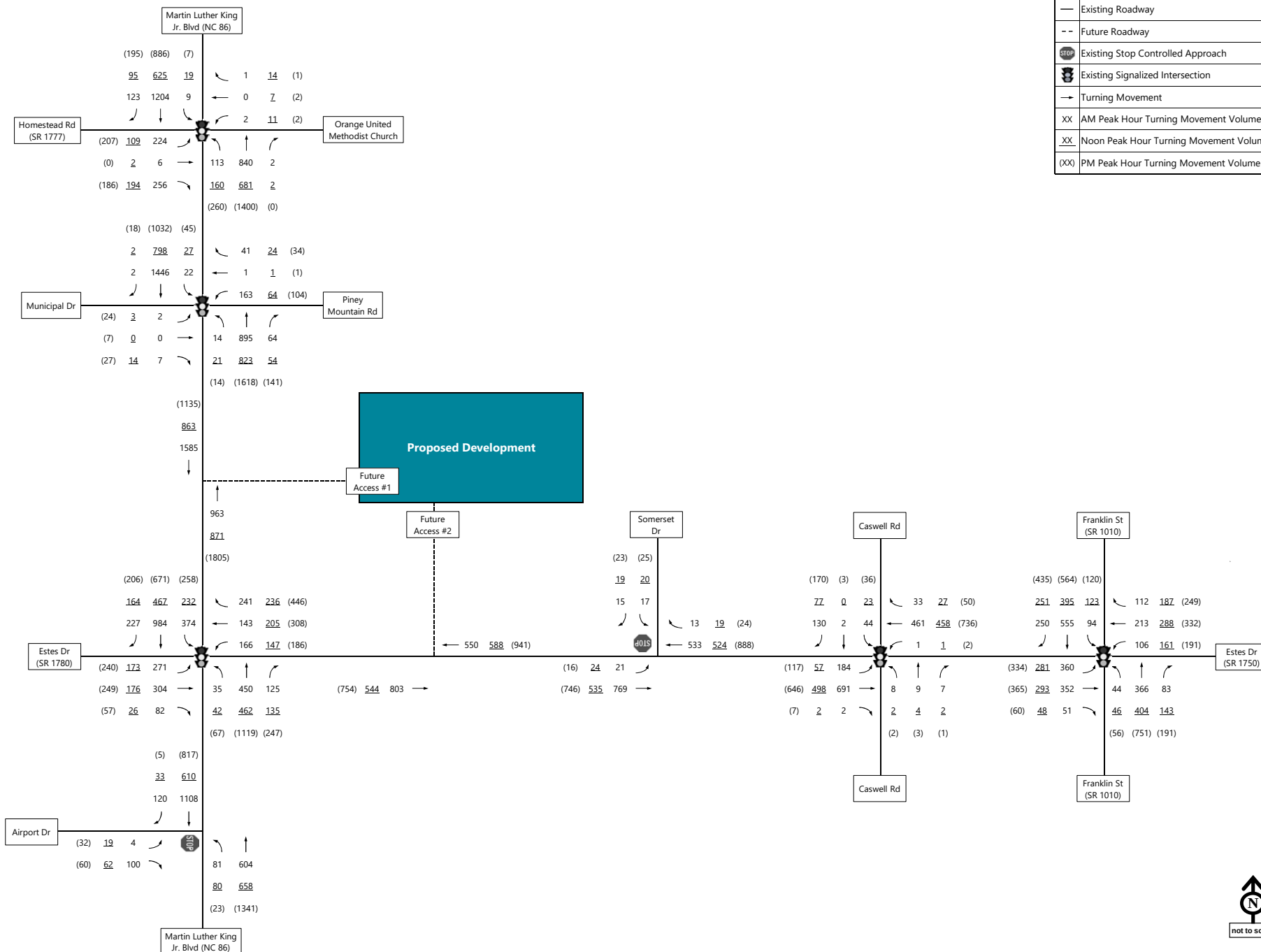
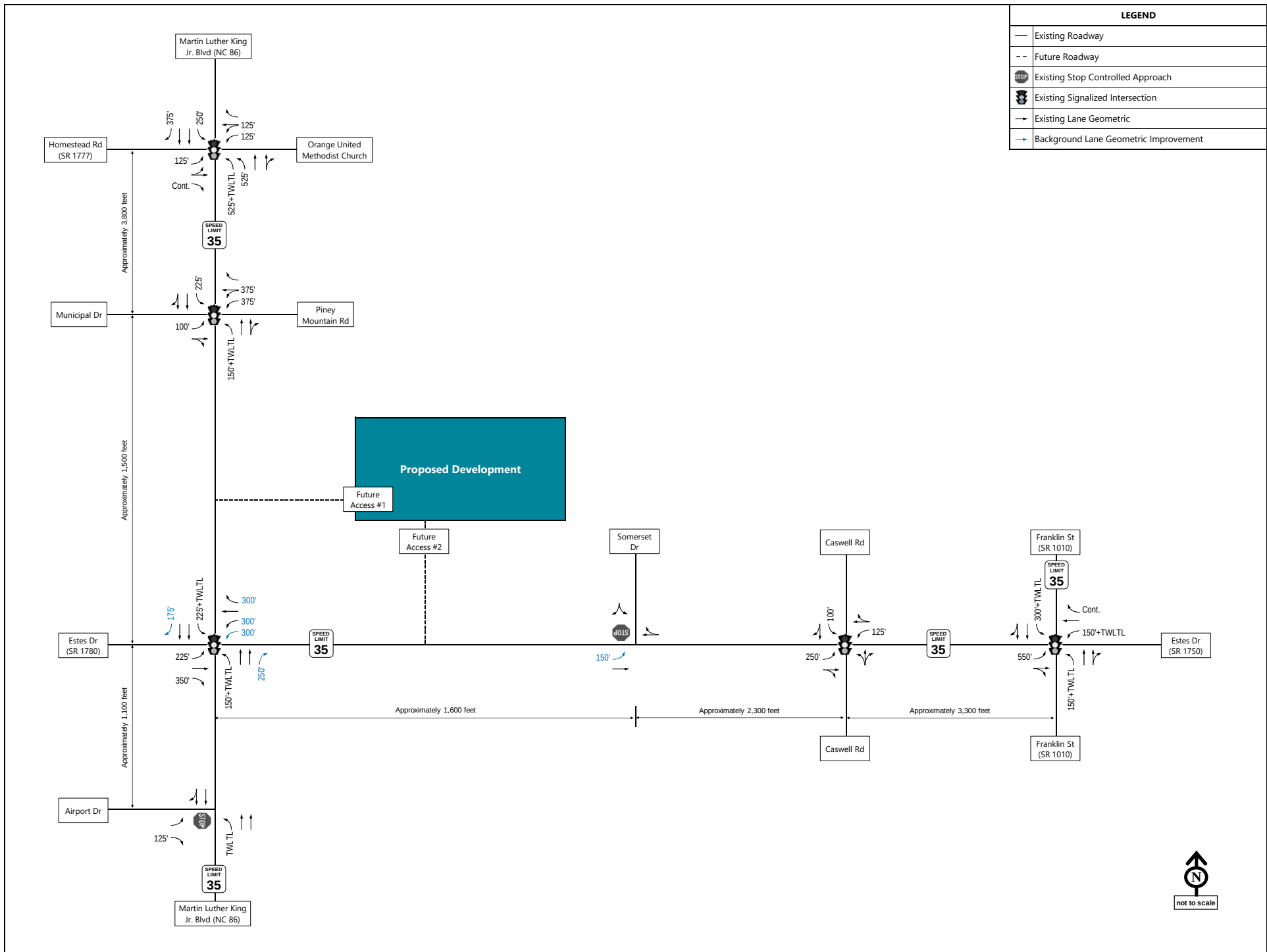


Figure 9
No-Build (2024) AM, Noon, and PM Peak Hour Volumes

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Chapel Hill, NC





4

Build (2024) Conditions

Trinsic Residential Group plans to develop a parcel of land in the northeast corner of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) in Chapel Hill, NC (Figure 1). The proposed development will consist of 58 townhomes, 361 mid-rise apartments, a 3,032-square foot small office building, and 8,564 square feet of retail space. The development is expected to be fully constructed and occupied by the end of 2023.

Trip Generation

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's "*Rate vs. Equation*" *Spreadsheet*. The proposed development is to consist of approximately 58 townhomes, 361 mid-rise apartments, a 3,032-square foot small office building, and 8,564 square feet of retail space; ITE LUC 220 (Multifamily Housing (Low-Rise)), LUC 221 (Multifamily Housing (Mid-Rise)), LUC 712 (Small Office Building), and LUC 820 (General Retail) were used based on NCDOT guidance.

A transit reduction was taken for the proposed trip generation to account for the current transit service to the area. The new Bus Rapid Transit system is proposed along Martin Luther King Jr. Boulevard (NC 86), but construction will not begin until 2024; therefore, no additional transit reductions were applied to the generated trips. The external site trips were reduced by 10% to account for the trips that will utilize the existing transit service stops near the development. This reduction also accounts for non-motorized travel, such as bicycle and pedestrian trips to and from the site. A sidewalk currently runs along the east side of Martin Luther King Jr. Boulevard (NC 86), and the Estes Drive Connectivity Project will improve bicycle

and pedestrian facilities along Estes Drive (SR 1750). Table 15 summarizes the assumed trip generation for the proposed development for typical weekday AM and PM peak hours.

Table 15 Trip Generation Rates (Vehicle Trips)

Land Use Code ¹	Land Use	Unit	ADT	AM Peak Hour			Noon Peak Hour ⁵			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Total Site Trips ²												
220	Multifamily Housing (Low-Rise)	58 du	398	6	22	28	15	17	32	23	13	36
221	Multifamily Housing (Mid-Rise)	361 du	1,966	31	89	120	62	74	136	93	59	152
712	Small Office Building	3,032 sf	49	6	4	10	6	5	11	5	6	11
820	General Retail	8,564 sf	1,130	51	31	82	47	38	85	42	46	88
Development Total			3,543	94	146	240	130	134	264	163	124	287
Trip Reduction Due to Internal Capture ³												
220	Multifamily Housing (Low-Rise)	58 du	23	0	0	0	1	1	2	2	1	3
221	Multifamily Housing (Mid-Rise)	361 du	111	1	1	2	5	3	8	9	5	14
712	Small Office Building	3,032 sf	12	0	1	1	2	1	3	3	1	4
820	General Retail	8,564 sf	120	2	1	3	3	6	9	4	11	15
Development Total			265	3	3	6	11	11	22	18	18	36
Total External Site Trips without Transit Reduction												
220	Multifamily Housing (Low-Rise)	58 du	375	6	22	28	14	16	30	21	12	33
221	Multifamily Housing (Mid-Rise)	361 du	1,855	30	88	118	57	71	128	84	54	138
712	Small Office Building	3,032 sf	37	6	3	9	4	4	8	2	5	7
820	General Retail	8,564 sf	1,010	49	30	79	44	32	76	38	35	73
Development Total			3,277	91	143	234	119	123	242	145	106	251
Total External Site Trips with 10% Transit Reduction												
220	Multifamily Housing (Low-Rise)	58 du	338	5	20	25	13	14	27	19	11	30
221	Multifamily Housing (Mid-Rise)	361 du	1,670	27	79	106	51	64	115	76	49	125
712	Small Office Building	3,032 sf	33	5	3	8	4	4	8	2	5	7
820	General Retail	8,564 sf	909	44	27	71	40	29	69	34	32	66
Development Total			2,950	81	129	210	108	111	219	131	97	228
Total External Pass-by Site Trips ⁴												
220	Multifamily Housing (Low-Rise)	58 du		0	0	0	0	0	0	0	0	0
221	Multifamily Housing (Mid-Rise)	361 du		0	0	0	0	0	0	0	0	0
712	Small Office Building	3,032 sf		0	0	0	0	0	0	0	0	0
820	General Retail	8,564 sf		0	0	0	0	0	0	11	11	22
Development Total				0	0	0	0	0	0	11	11	22
Total External Non-Pass-by Site Trips												
220	Multifamily Housing (Low-Rise)	58 du		5	20	25	13	14	27	19	11	30
221	Multifamily Housing (Mid-Rise)	361 du		27	79	106	51	64	115	76	49	125
712	Small Office Building	3,032 sf		5	3	8	4	4	8	2	5	7
820	General Retail	8,564 sf		44	27	71	40	29	69	23	21	44
Development Total				81	129	210	108	111	219	120	86	206

Notes:

1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 10th Edition*.
2. Total site trips are determined based on the suggested method in the NCDOT Rate vs Equation Spreadsheet.
3. Internal capture was based on NCHRP 684 method and NCDOT IC calculation spreadsheet (1,000 ft maximum between uses).
4. Unconstrained pass-by trips are calculated based on *ITE Trip Generation Handbook, 3rd Edition*. The final projections are not expected to exceed 10% of adjacent street volumes.
5. Noon peak hour trips assumed to be an average of the AM and PM peak hour trips.

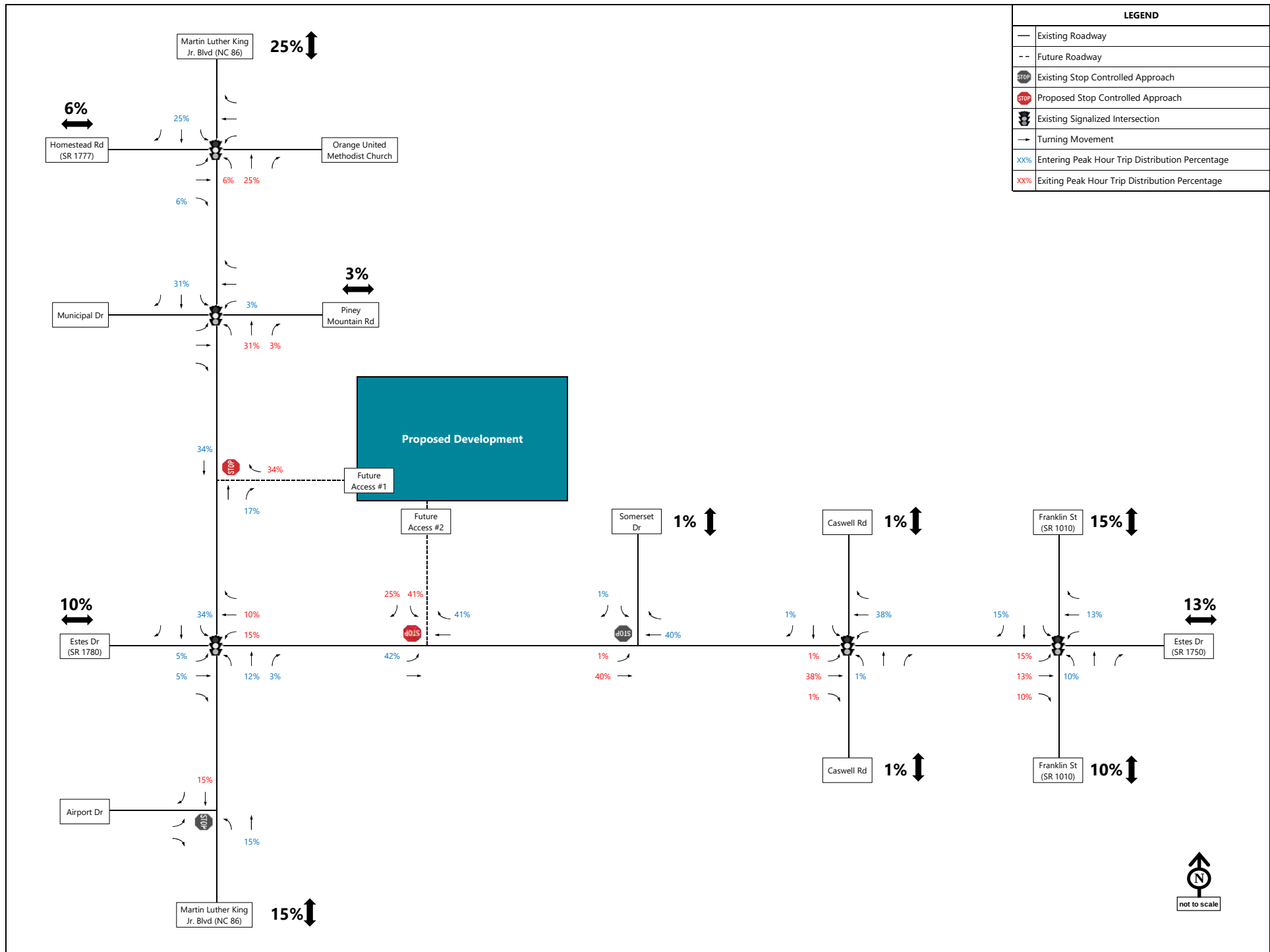
Distribution and Assignment

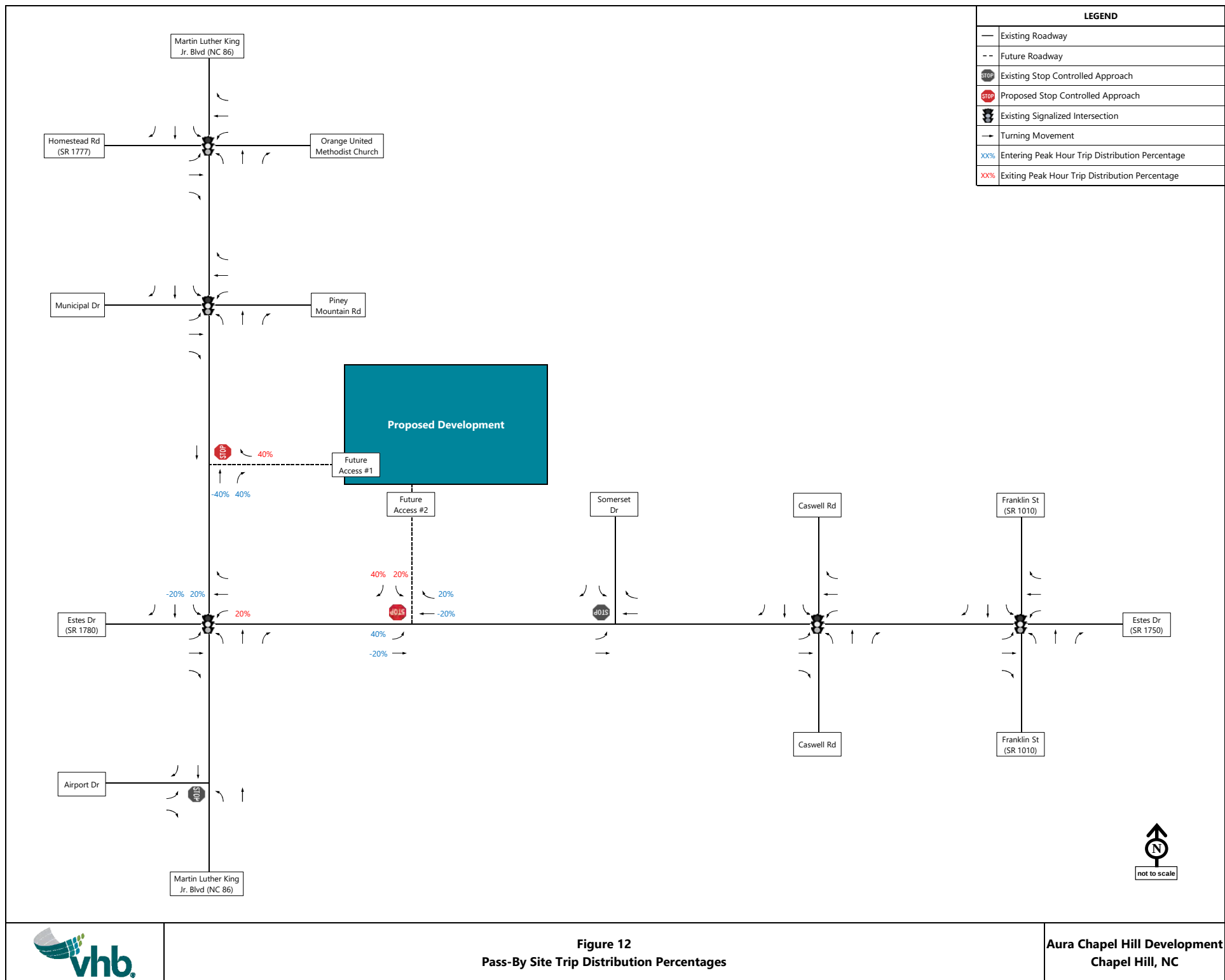
The proposed development will construct one (1) access point along Martin Luther King Jr. Boulevard (NC 86), and one (1) access point along Estes Drive (SR 1750). The generated non-pass-by site trips were distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area as follows:

- › Martin Luther King Jr. Boulevard (NC 86) to/from the north – 25%
- › Martin Luther King Jr. Boulevard (NC 86) to/from the south – 15%
- › Estes Drive (SR 1780) to/from the west – 10%
- › Estes Drive (SR 1750) to/from the east – 13%
- › Franklin Street (SR 1010) to/from the north – 15%
- › Franklin Street (SR 1010) to/from the south – 10%
- › Caswell Road to/from the south – 1%
- › Caswell Road to/from the north – 1%
- › Somerset Drive to/from the north – 1%
- › Piney Mountain Road to/from the east – 3%
- › Homestead Road (SR 1777) to/from the west – 6%

Pass-by trips were distributed based on existing traffic flow in the area. The total non-pass-by site trip percentages referenced above are shown in Figure 11, and the pass-by trip percentages are shown in Figure 12. The resulting non-pass-by and pass-by trips are depicted in Figure 13 and Figure 14, respectively. The total site-generated trips are shown in Figure 15.

LEGEND	
	Existing Roadway
	Future Roadway
	Existing Stop Controlled Approach
	Proposed Stop Controlled Approach
	Existing Signalized Intersection
	Turning Movement
	Entering Peak Hour Trip Distribution Percentage
	Exiting Peak Hour Trip Distribution Percentage





LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Proposed Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

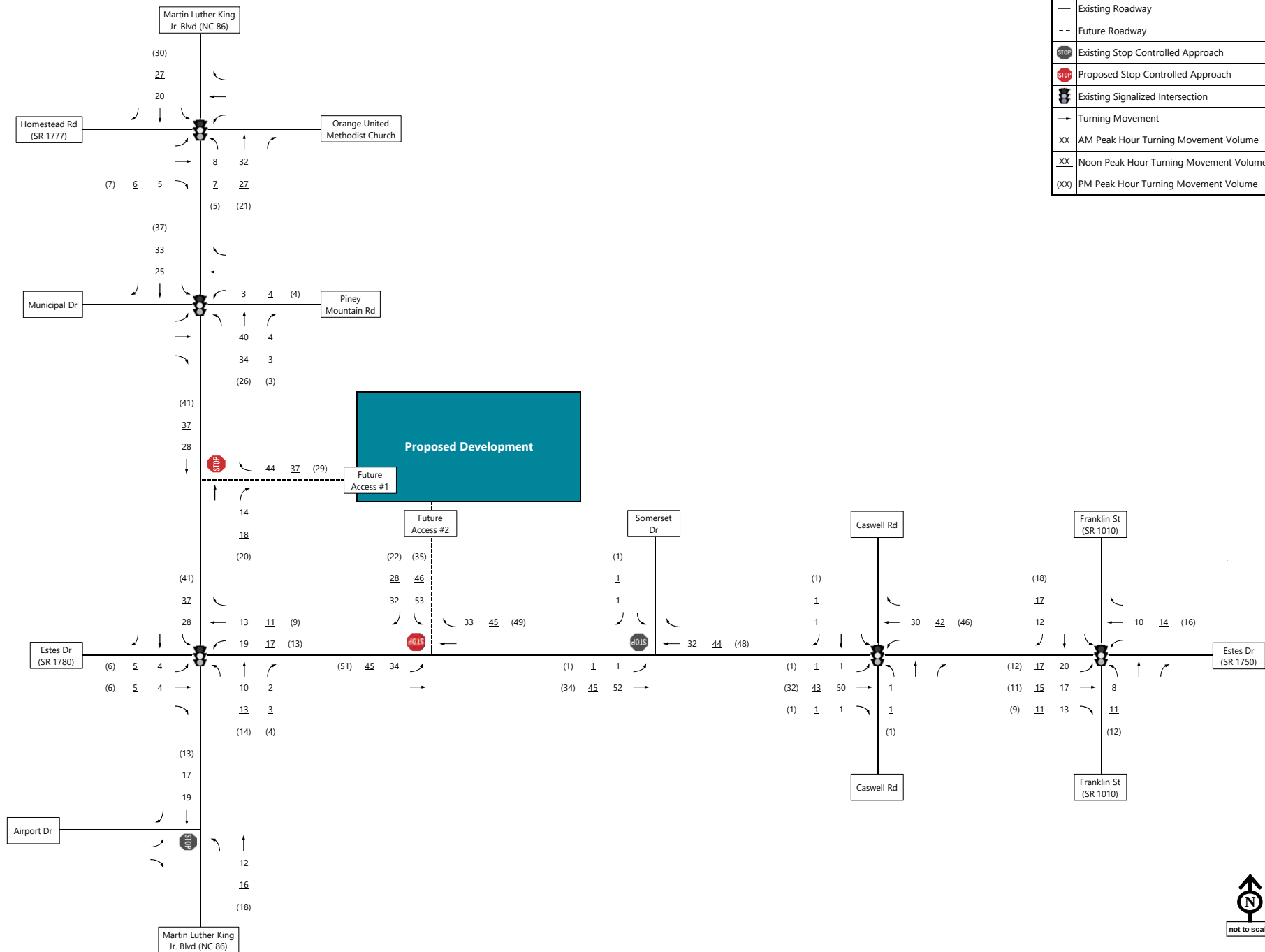


Figure 13
Non-Pass-By AM, Noon, and PM Peak Hour Site Generated Trips

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Chapel Hill, NC



LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Proposed Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

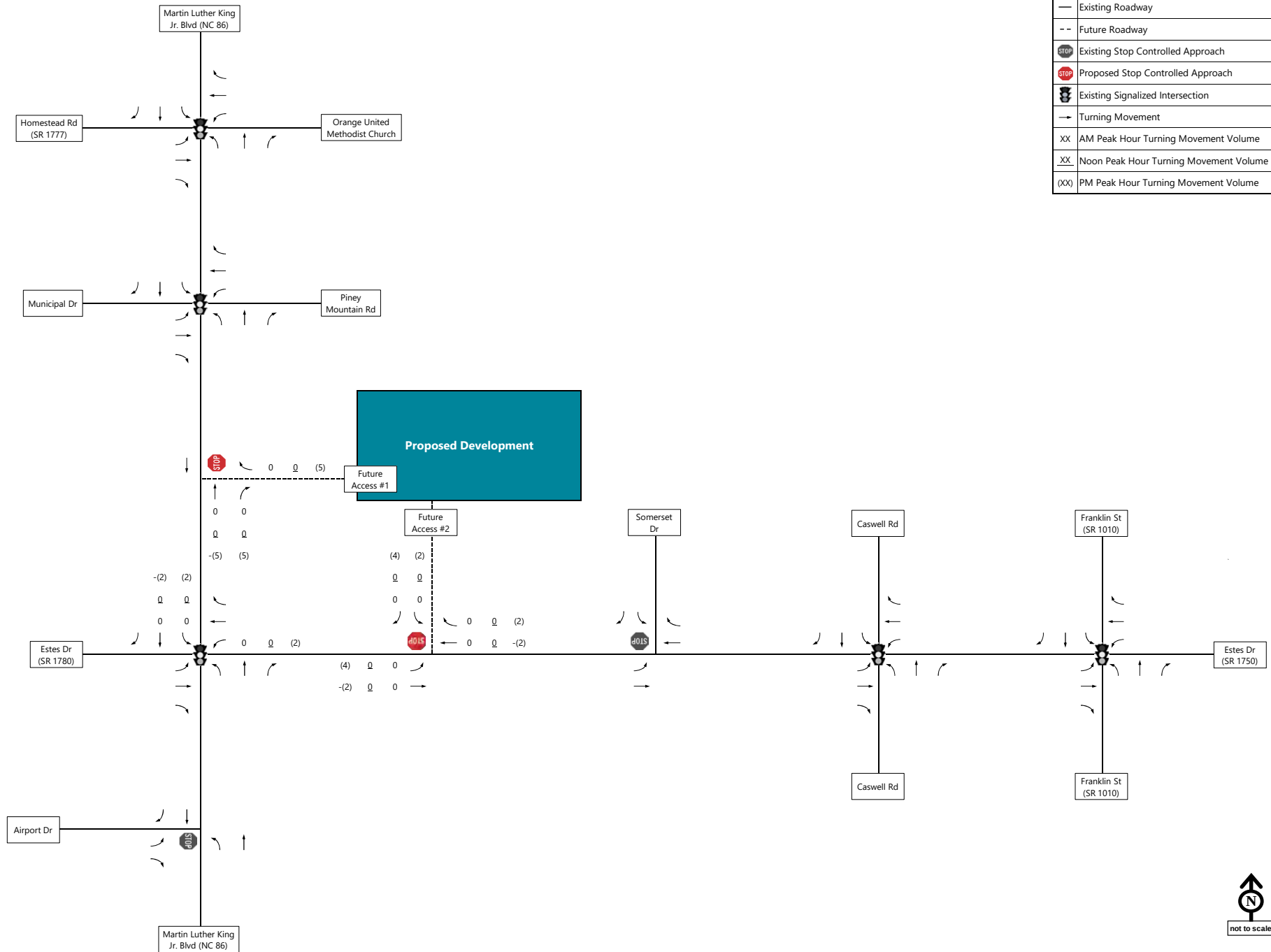


Figure 14
Pass-By AM, Noon, and PM Peak Hour Site Generated Trips

Aura Chapel Hill Development
Chapel Hill, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Proposed Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

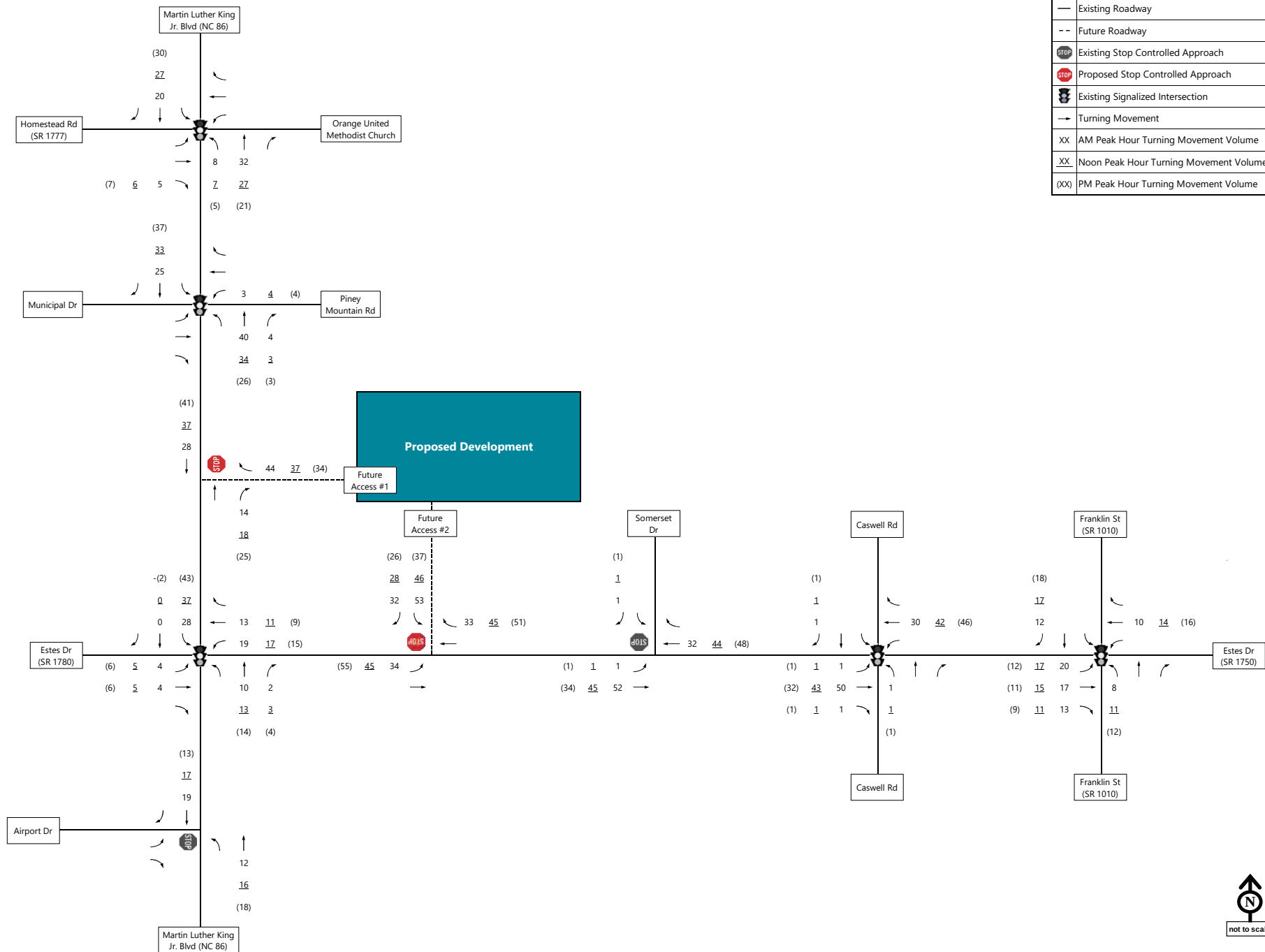


Figure 15
Total AM, Noon, and PM Peak Hour Site Generated Trips

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Chapel Hill, NC



Signal Warrant Analysis

If a traffic signal was recommended for an intersection that is not currently signalized or is not proposed to be signalized under Build (2024) Conditions, then AM, Noon, and PM peak hour turning movements were reviewed to determine if a peak hour signal warrant was expected to be met. Currently, no unsignalized intersection meets the minimum threshold for signal warrants based on the *Manual of Uniform Traffic Control Devices* (MUTCD) guidance.

The peak hour volumes projected for Future Access #2 along Estes Drive (SR 1750) were evaluated against Warrant 3 (Peak Hour) within the MUTCD. The projected volumes for each peak hour will not meet Warrant 3 for signalization.

Sight Distance Analysis

The driveways along Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) are on long tangent sections allowing for adequate sight distance for drivers. Any landscaping or signs within the development site triangles should be removed to further improve visibility for drivers.

Special Analysis/Issues Related to Project

Based on discussions with the Town of Chapel Hill staff, there are no special issues associated with this project, and no special analyses needed beyond the ones included within this report.

Level of Service Analysis

Intersection LOS analyses were performed for the typical weekday AM, Noon, and PM peak hours using *Synchro/SimTraffic Professional Version 10*. The calculated Build (2024) peak hour turning movement volumes are depicted in Figure 16. The coordinated signal timings analyzed within the No-Build (2024) scenario were maintained for the Build (2024) analysis. A summary of the findings for the Build (2024) scenario LOS analysis can be found in Appendix E.

As reported in Table 16, the signalized intersection of Franklin Street (SR 1010) and Estes Drive (SR 1750) is expected to continue to operate at LOS E during the PM peak hour. All other signalized intersections are expected to operate acceptably. Stop-controlled southbound Future Access #2 will operate at LOS F during the AM and PM peak hours and LOS E during the Noon peak hour. All other stop-controlled approaches will operate acceptably.

Table 16 Build (2024) LOS Results

Intersection and Approach	Traffic Control	Build (2024)		
		AM	Noon	PM
Martin Luther King Jr. Boulevard (NC 86) and Airport Road	Unsignalized	-	-	-
Eastbound		C-19.2	B-13.4	C-17.8
Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750/SR 1780)	Signalized	D (36.2)	C (31.8)	D (52.3)
Eastbound		E-58.4	D-44.1	E-66.5
Westbound		D-48.8	D-48.5	E-69.9
Northbound		C-33.4	C-24.9	D-50.3
Southbound		C-23.5	C-20.1	C-33.5
Martin Luther King Jr. Boulevard (NC 86) and Piney Mountain Road/Municipal Drive	Signalized	A (8.6)	A (5.1)	B (10.8)
Eastbound		E-61.0	E-59.4	E-72.0
Westbound		E-65.4	E-58.0	E-71.3
Northbound		A-4.3	A-2.4	A-5.5
Southbound		A-3.3	A-1.2	A-8.6
Martin Luther King Jr. Boulevard (NC 86) and Homestead Road (SR 1777)/Church Driveway	Signalized	C (23.2)	C (21.8)	C (20.7)
Eastbound		D-53.1	D-46.6	D-54.6
Westbound		D-51.3	D-45.5	E-58.6
Northbound		B-10.9	B-19.6	B-13.3
Southbound		C-21.4	B-13.3	B-19.6
Estes Drive and Somerset Drive	Unsignalized	-	-	-
Southbound		C-21.1	C-18.2	E-36.1
Estes Drive and Casewell Drive	Signalized	B (14.7)	A (9.9)	C (21.1)
Eastbound		A-7.8	A-3.8	A-8.0
Westbound		B-14.3	A-9.3	C-24.6
Northbound		C-34.4	D-37.3	C-35.0
Southbound		D-48.9	D-46.7	E-57.3
Franklin Street (SR 1010) and Estes Drive (SR 1750)	Signalized	D (52.9)	D (50.2)	E (69.3)
Eastbound		E-70.1	D-53.4	E-72.7
Westbound		D-42.0	D-46.9	F-81.7
Northbound		D-42.7	D-51.1	E-61.8
Southbound		D-48.4	D-49.7	E-65.1
Martin Luther King Jr. Boulevard (NC 86) and Future Access #1	Unsignalized	-	-	-
Westbound		B-13.3	B-12.5	C-23.2
Estes Drive (SR 1750) and Future Access #2	Unsignalized	-	-	-
Southbound		F-60.5	E-36.0	F-166.5

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay.

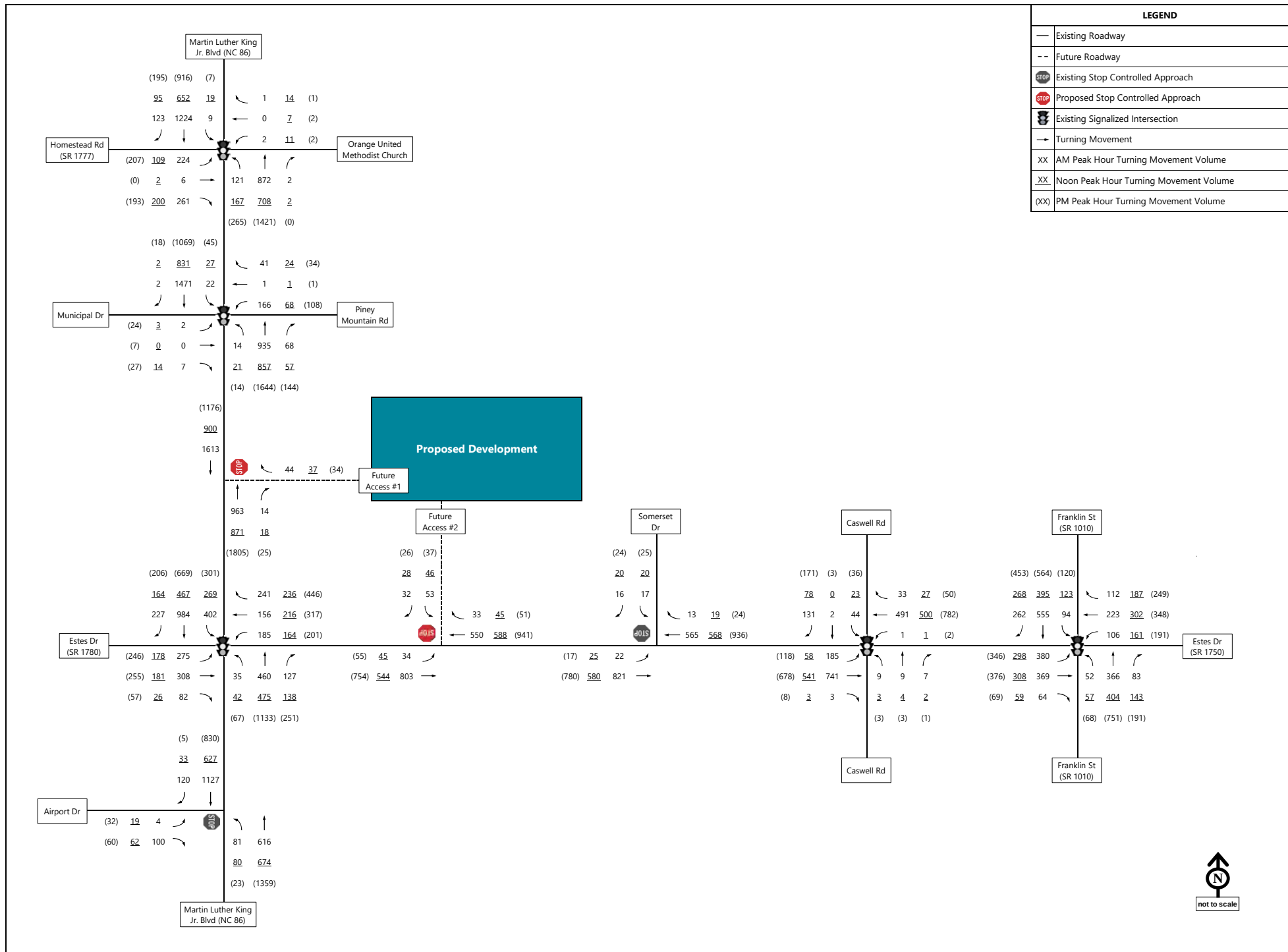


Figure 16
Build (2024) AM, Noon, and PM Peak Hour Turning Movement Volumes

Roundabout Alternative Analysis

The previously submitted TIA for this development also proposed a roundabout as a possible traffic control alternative for Future Access #2. The roundabout alternative was analyzed for this TIA update in order to determine if it would still be a viable option for the future site access. The roundabout option was analyzed in *SIDRA Intersection 8.0*, and the results are displayed in Table 17. NCDOT Congestion Management Guidelines require the analysis of operations for the roundabout 20 years after the buildout of the site to determine if the roundabout can operate effectively long-term. Because roundabouts come with higher costs and more extensive impacts in comparison to conventional stop-controlled intersections, the intersection must be able to operate acceptably for many years after implementation of the roundabout. The output reports from *SIDRA* are attached in Appendix E.

Table 17 Roundabout Alternative LOS Results

Intersection and Approach	Traffic Control	Build (2024)			Future Year (2044)		
		AM	Noon	PM	AM	Noon	PM
Estes Drive (SR 1750) and Future Access #2	Roundabout	B (11.5)	A (8.4)	B (13.3)	B (14.0)	A (9.3)	C (17.2)
Eastbound		B-14.3	A-8.0	B-10.9	C-18.2	A-8.7	B-12.7
Westbound		A-8.2	A-8.9	C-15.3	A-9.0	A-10.0	C-20.9
Southbound		A-6.6	A-6.6	A-10.0	A-7.1	A-7.2	B-11.4

As shown in Table 17, the roundabout will operate acceptably during all peak hours for the year of opening, as well as 20 years after the buildout of the site. The following driveway configuration should be provided for the roundabout intersection, if it is desired:

- › Provide one ingress lane and one egress lane at the full movement driveway.
- › Provide approximately 200 feet of storage for a westbound right-turn lane along Estes Drive (SR 1750).
- › Provide a single lane for the eastbound approach along Estes Drive (SR 1750).



5

Findings and Conclusions

The proposed development is expected to impact operations at multiple study intersections under Build (2024) conditions. To improve operations at these locations, the following offsite improvements should be considered and were analyzed within the Build (2024) with Improvements scenario. The proposed intersection configurations are shown in Figure ES-3.

Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750) (signalized)

The existing signalized intersection is projected to operate at LOS D during the AM and PM peak hours under Build (2024) conditions. For this development, the following improvements are recommended:

- › Extend the storage of the existing westbound right-turn lane to at least 500 feet of full storage with appropriate taper.
- › Incorporate bicycle and pedestrian facility accommodations along the site's Estes Drive (SR 1750) frontage.
- › Incorporate pedestrian facility improvements along the site's Martin Luther King Jr. Boulevard (NC 86) frontage and incorporate a bus stop and related amenities for transit riders.

Franklin Street (SR 1010) and Estes Drive (SR 1750) (signalized)

The existing signalized intersection is projected to operate at LOS E during the PM peak hour under Build (2024) conditions. To improve overall operations at the intersection, and help mitigate the site's impacts, the following roadway improvement is recommended with this development:

- › Construct an exclusive southbound right-turn lane with a minimum of 350 feet of storage with appropriate taper.

In addition to offsite improvements, the following driveway configurations should be considered.

Martin Luther King Jr. Boulevard (NC 86) at Future Access #1

The stop-controlled driveway is projected to operate at LOS B during the AM and Noon peak hours and LOS C during the PM peak hour under Build (2024) conditions. The following driveway configuration is recommended:

- › Provide one ingress lane and one egress lane along the driveway. Restrict access along the driveway to right-in/right-out only.
- › Construct an exclusive northbound right-turn lane along Martin Luther King Jr. Boulevard (NC 86) with at least 100 feet of full storage and appropriate taper.
- › Provide a high-visibility painted crosswalk across the driveway.

Estes Drive (SR 1750) at Future Access #2

The stop-controlled driveway is projected to operate at LOS F during the AM and PM peak hours under Build (2024) conditions. The projected site generated trips are not expected to meet signal warrants after the buildout of the development, and signalization would not be recommended given the proximity of the existing traffic signal at Martin Luther King Jr. Boulevard (NC 86). The crash history along Estes Drive (SR 1750) does not show a pattern of a high rate of frontal impact crashes within the vicinity of the proposed driveway; therefore, there are no concerns with providing a full movement driveway along Estes Drive (SR 1750). The following lane configurations are recommended with the driveway for Future Access #2:

- › Provide one ingress lane and two egress lanes at the full movement driveway. Provide a minimum of 100 feet of storage for an exclusive southbound left-turn lane along the driveway.
- › Construct an exclusive eastbound left-turn lane with a minimum of 100 feet of full storage with appropriate taper.
- › Construct an exclusive right-turn lane along westbound Estes Drive (SR 1750) with a minimum of 100 feet of full storage and appropriate taper.
- › Provide a high-visibility painted crosswalk across the driveway.

The summary LOS results are shown in Table 18, and Figure 17 shows the Build (2024) with Improvements lane geometrics and traffic control. The queue analysis results from SimTraffic for the Build (2024) with Improvements scenario are shown in Table 19 to confirm the storage length recommendations.

Table 18 Summary of LOS Results

Intersection and Approach	Traffic Control	Existing (2020)			No-Build (2024)			Build (2024)			Build (2024) with Improvements		
		AM	Noon	PM	AM	Noon	PM	AM	Noon	PM	AM	Noon	PM
Martin Luther King Jr. Boulevard (NC 86) and Airport Road	Unsignalized	-	-	-	-	-	-	-	-	-	-	-	-
Eastbound		C-18.0	B-12.8	C-16.4	C-18.9	B-13.3	C-17.6	C-19.2	B-13.4	C-17.8	C-19.2	B-13.4	C-17.8
Martin Luther King Jr. Boulevard (NC 86) and Estes Drive (SR 1750/SR 1780)	Signalized	D (38.4)	C (32.6)	D (54.2)	D (35.4)	C (30.1)	D (48.8)	D (36.2)	C (31.8)	D (52.3)	D (36.2)	C (31.7)	D (52.3)
Eastbound		E-56.6	D-53.2	E-63.4	E-57.8	D-43.8	E-64.3	E-58.4	D-44.1	E-66.5	E-58.4	D-44.1	E-66.5
Westbound		D-37.0	D-43.5	F-82.3	D-47.3	D-48.7	E-68.3	D-48.8	D-48.5	E-69.9	D-48.8	D-48.5	E-69.9
Northbound		D-42.4	C-25.1	D-52.5	C-31.1	C-22.8	D-48.4	C-33.4	C-24.9	D-50.3	C-33.4	C-24.7	D-50.3
Southbound		C-29.5	C-21.1	C-28.1	C-23.6	B-16.8	C-25.6	C-23.5	C-20.1	C-33.5	C-23.5	B-20.0	C-33.5
Martin Luther King Jr. Boulevard (NC 86) and Piney Mountain Road/Municipal Drive	Signalized	A (8.4)	A (5.4)	B (10.3)	A (8.6)	A (5.1)	B (10.6)	A (8.6)	A (5.1)	B (10.8)	A (8.6)	A (5.1)	B (10.8)
Eastbound		E-61.0	E-59.4	E-71.8	E-61.0	E-59.4	E-72.0	E-61.0	E-59.4	E-72.0	E-61.0	E-59.4	E-72.0
Westbound		E-65.3	E-57.6	E-70.9	E-65.5	E-57.7	E-71.3	E-65.4	E-58.0	E-71.3	E-65.4	E-58.0	E-71.3
Northbound		A-3.9	A-2.5	A-4.2	A-4.6	A-2.2	A-5.2	A-4.3	A-2.4	A-5.5	A-4.3	A-2.4	A-5.5
Southbound		A-3.0	A-1.3	A-8.9	A-3.0	A-1.5	A-8.3	A-3.3	A-1.2	A-8.6	A-3.3	A-1.2	A-8.6
Martin Luther King Jr. Boulevard (NC 86) and Homestead Road (SR 1777)/Church Driveway	Signalized	C (22.6)	C (21.3)	C (20.2)	C (23.2)	C (21.1)	C (20.6)	C (23.2)	C (21.8)	C (20.7)	C (23.2)	C (21.8)	C (20.7)
Eastbound		D-53.1	D-46.3	D-54.8	D-53.1	D-46.5	D-54.7	D-53.1	D-46.6	D-54.6	D-53.1	D-46.6	D-54.6
Westbound		D-51.3	D-45.5	E-58.6	D-51.3	D-45.5	E-58.6	D-51.3	D-45.5	E-58.6	D-51.3	D-45.5	E-58.6
Northbound		B-10.4	B-18.4	B-12.8	B-11.0	B-18.0	B-13.3	B-10.9	B-19.6	B-13.3	B-10.9	B-19.6	B-13.3
Southbound		B-19.9	B-12.6	B-18.6	C-21.0	B-13.0	B-19.3	C-21.4	B-13.3	B-19.6	C-21.4	B-13.3	B-19.6
Estes Drive and Somerset Drive	Unsignalized	-	-	-	-	-	-	-	-	-	-	-	-
Southbound		C-18.2	C-15.4	D-25.8	C-19.7	C-16.9	D-32.2	C-21.1	C-18.2	E-36.1	C-21.1	C-18.2	E-36.1
Estes Drive and Casewell Drive	Signalized	B (13.9)	A (9.7)	B (18.6)	B (14.3)	A (9.8)	B (19.6)	B (14.7)	A (9.9)	C (21.1)	B (14.7)	A (9.9)	C (21.1)
Eastbound		A-6.7	A-3.3	A-6.6	A-7.1	A-3.6	A-7.3	A-7.8	A-3.8	A-8.0	A-7.8	A-3.8	A-8.0
Westbound		B-12.9	A-8.4	B-19.7	B-13.7	A-8.8	C-21.7	B-14.3	A-9.3	C-24.6	B-14.3	A-9.3	C-24.6
Northbound		C-34.5	D-37.0	C-34.2	C-34.3	D-36.9	C-34.8	C-34.4	D-37.3	C-35.0	C-34.4	D-37.3	C-35.0
Southbound		D-48.8	D-46.4	D-54.0	D-48.9	D-46.6	E-56.8	D-48.9	D-46.7	E-57.3	D-48.9	D-46.7	E-57.3
Franklin Street (SR 1010) and Estes Drive (SR 1750)	Signalized	D (48.5)	D (47.9)	E (58.0)	D (49.8)	D (49.1)	E (64.0)	D (52.9)	D (50.2)	E (69.3)	D (43.1)	D (46.4)	E (59.6)
Eastbound		E-66.0	E-55.9	E-67.0	E-66.1	D-54.6	E-69.2	E-70.1	D-53.4	E-72.7	D-47.8	D-53.4	E-70.0
Westbound		D-49.5	D-49.6	E-62.5	D-47.1	D-47.7	E-68.6	D-42.0	D-46.9	F-81.7	D-45.7	D-46.9	E-66.0
Northbound		D-37.3	D-44.2	D-62.2	D-39.2	D-48.0	E-63.0	D-42.7	D-51.1	E-61.8	D-46.1	D-51.1	E-68.4
Southbound		D-39.7	D-43.5	D-52.7	D-43.0	D-46.7	E-58.2	D-48.4	D-49.7	E-65.1	D-36.1	D-36.4	D-40.0
Martin Luther King Jr. Boulevard (NC 86) and Future Access #1	Unsignalized	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Westbound		---	---	---	---	---	---	B-13.3	B-12.5	C-23.2	B-13.2	B-12.4	C-22.8
Estes Drive (SR 1750) and Future Access #2	Unsignalized	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Southbound		---	---	---	---	---	---	F-60.5	E-36.0	F-166.5	E-45.6	D-29.4	F-97.3

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay.

Table 19 Build (2024) with Improvements SimTraffic Queue Results

Intersection/Movement	Build (2024) with Improvements					
	SimTraffic 95th Queue			SimTraffic Max Queue		
	AM	Noon	PM	AM	Noon	PM
Martin Luther King Jr. Boulevard (NC 86) at Airport Drive						
Eastbound Left-Turn	19	44	65	32	50	80
Eastbound Right-Turn	72	53	57	89	65	72
Northbound Left-Turn	73	54	43	91	64	56
Northbound Through	29	20	36	67	42	59
Southbound Through/Right-Turn	53	24	32	96	50	62
Martin Luther King Jr. Boulevard (NC 86) at Estes Drive (SR 1750/SR 1780)						
Eastbound Left-Turn	335	193	343	325	230	316
Eastbound Through	456	217	480	562	285	580
Eastbound Right-Turn	188	47	168	356	72	271
Westbound Left-Turn	140	119	453	166	140	400
Westbound Through	225	254	739	272	318	677
Westbound Right-Turn	178	192	434	220	254	481
Northbound Left-Turn	65	84	227	86	139	250
Northbound Through	237	194	636	275	216	670
Northbound Right-Turn	100	88	437	125	106	350
Southbound Left-Turn	354	229	363	325	276	325
Southbound Through	408	149	432	417	186	417
Southbound Right-Turn	277	95	123	275	114	177
Martin Luther King Jr. Boulevard (NC 86) at Piney Mountain Road/Municipal Drive						
Eastbound Left-Turn	9	14	56	19	22	68
Eastbound Through/Right-Turn	45	66	82	65	96	104
Westbound Left-Turn	160	80	133	184	97	156
Westbound Through/Right-Turn	91	62	84	113	78	106
Northbound Left-Turn	36	40	47	53	62	78
Northbound Through/Right-Turn	152	119	356	203	170	399
Southbound Left-Turn	39	42	82	48	54	95
Southbound Through/Right-Turn	161	112	229	230	157	287
Martin Luther King Jr. Boulevard (NC 86) at Homestead Road (SR 1777)						
Eastbound Left-Turn	168	52	145	184	87	165
Eastbound Left/Through	186	109	166	210	139	182
Eastbound Right-Turn	251	177	178	294	211	218
Westbound Left-Turn	4	10	3	6	20	3
Westbound Left/Through	16	53	17	26	68	24
Westbound Right-Turn	16	41	13	29	58	20
Northbound Left-Turn	108	109	170	124	122	187
Northbound Through/Right-Turn	122	162	243	156	192	267
Southbound Left-Turn	40	25	15	53	41	22
Southbound Through	366	220	311	428	241	359
Southbound Right-Turn	76	65	115	99	80	147
Estes Drive (SR 1750) at Somerset Drive						
Eastbound Left-Turn	33	35	34	36	49	42
Southbound Left/Right-Turn	58	64	90	66	77	112
Estes Drive (SR 1750) at Caswell Road						
Eastbound Left-Turn	118	52	112	157	63	156
Eastbound Through/Right-Turn	246	144	227	186	177	258
Westbound Left-Turn	32	5	9	53	9	21
Westbound Through/Right-Turn	284	183	439	348	244	467
Northbound Left/Through/Right	61	42	28	74	60	37
Southbound Left-Turn	78	48	74	103	60	124
Southbound Through/Right-Turn	148	105	191	172	134	218
Franklin Street (SR 1010) at Estes Drive (SR 1750)						
Eastbound Left-Turn	417	367	432	473	425	474
Eastbound Through/Right-Turn	386	370	480	442	401	510
Westbound Left-Turn	159	251	305	244	250	250
Westbound Through	280	392	588	346	478	650
Westbound Right-Turn	122	212	263	145	266	355
Northbound Left-Turn	85	118	265	106	170	250
Northbound Through/Right-Turn	214	267	510	243	274	574
Southbound Left-Turn	148	180	211	178	210	239
Southbound Through	250	201	266	278	229	295
Southbound Right-Turn	170	172	311	204	208	360
Martin Luther King Jr. Boulevard (NC 86) at Future Access #1						
Westbound Right-Turn	42	42	53	54	53	67
Estes Drive (SR 1750) at Future Access #2						
Eastbound Left-Turn	43	49	54	60	59	64
Westbound Right-Turn	3	6	44	4	9	62
Southbound Left-Turn	72	56	67	91	70	81
Southbound Right-Turn	49	70	67	52	56	79

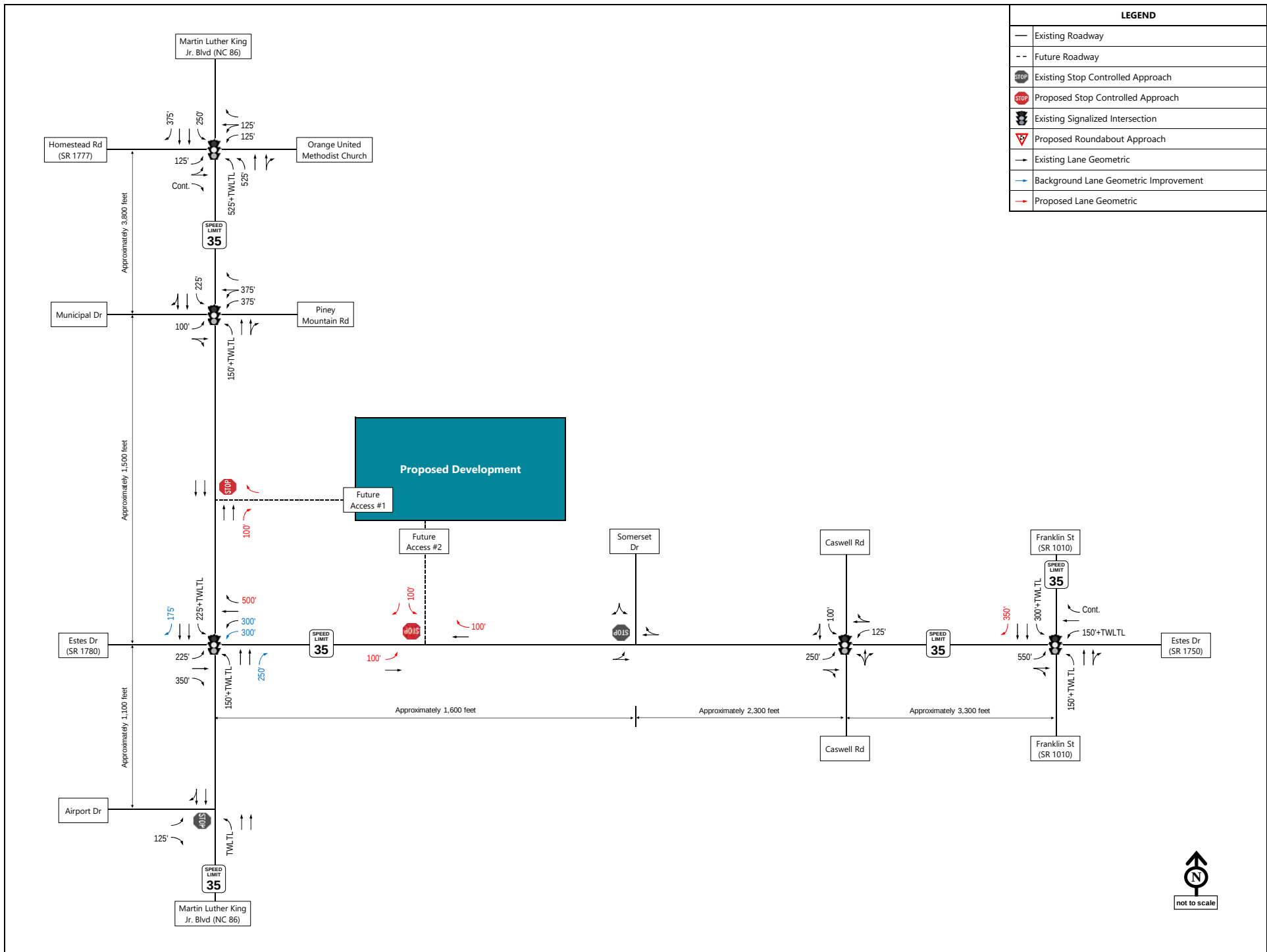


Figure 17
Build (2024) with Improvements Lane Geometrics and Traffic Control

Aura Chapel Hill Development
Chapel Hill, NC

Appendices

A

Memorandum of Understanding



Memorandum

To: Chuck Edwards, PE
NCDOT Division 7 District 1

Date: December 11, 2020

Kumar Neppalli
Town of Chapel Hill

Project #: 39155.00

From: Andrew Topp, PE, PTOE

Re: Aura Chapel Hill Development Memorandum of Understanding –
Chapel Hill, NC

This memorandum summarizes the assumptions for conducting a traffic impact analysis (TIA) for the proposed Aura Chapel Hill Development that is planned in the northeast corner of the intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive in Chapel Hill, North Carolina. The proposed development will build the following land use totals, with an expected full build-out year of 2024.

- 58 Townhomes/Condominiums
- 361 Mid-Rise Apartments
- 3,032 sf Small Office Building
- 8,564 sf General Retail Space

Based on a preliminary concept plan (attached), the development will be accessed through two (2) new connections. As a result, traffic may access the site from multiple directions as follows:

- Access #1, right-in/right-out only access on Martin Luther King Jr. Boulevard (NC 86), approximately 450 feet north of Estes Drive.
- Access #2, full movement access on Estes Drive, approximately 900 feet east of Martin Luther King Jr. Boulevard (NC 86).

Study Area

Based on preliminary scoping conducted with the Town of Chapel Hill, the following existing and future study area intersections will be analyzed for AM and PM peak hour conditions:

- Martin Luther King Jr. Boulevard (NC 86) at Estes Drive (SR 1750/SR 1780) (signalized)
- Martin Luther King Jr. Boulevard (NC 86) at Piney Mountain Road/Municipal Drive (signalized)
- Martin Luther King Jr. Boulevard (NC 86) at Homestead Road (SR 1777) (signalized)
- Martin Luther King Jr. Boulevard (NC 86) at Airport Drive (unsignalized)
- Estes Drive (SR 1750) at Somerset Drive (unsignalized)
- Estes Drive (SR 1750) at Caswell Drive (signalized)
- E Franklin Street (SR 1010) at Estes Drive (signalized)

Figure MOU-1 shows a vicinity map of the study area. The existing intersection's traffic control and lane geometrics throughout the study area are depicted in Figure MOU-2.

940 Main Campus Drive
Suite 500
Raleigh, NC 27606
P 919.829.0328

Data Collection

Turning movement counts for the study area intersections were collected on Tuesday, January 28th, 2020 while area schools were in session. Since the data was collected before the COVID-19 pandemic, no adjustments to the volumes will be made. The noon peak hour was also collected with these turning movement counts and will be included in the TIA. The collected Existing (2020) turning movement volumes are displayed in Figure MOU-3.

Analysis Scenarios

Based on NCDOT and Town of Chapel Hill TIA requirements, AM, Noon, and PM peak hour analysis will be performed the following four (4) scenarios:

- Existing (2020) Conditions
- No-Build (2024) Conditions
- Build (2024) Conditions
- Build (2024) Conditions - With Improvements (if necessary)

Background Projects and Growth

Based on historical traffic data in the study area, an annual growth rate of one-half percent (0.5%) will be applied to the existing year (2020) traffic volumes to project No-Build (2024) conditions. Three (3) background developments have been identified within the study area.

- 1200 MLK Redevelopment
- Retirement Residence at Somerset Drive
- UPlace Redevelopment

The peak hour site trips projected from any uncompleted portions of these background developments will be included in the No-Build (2024) and Build (2024) analysis. Any offsite improvements recommended as a part of either of these background developments will not be assumed in the analysis due to uncertainty about the construction timeline or committed funding for these improvements.

One background roadway improvement project has been identified within the study area. The Town of Chapel Hill Estes Drive Connectivity Project will provide the following lane geometric improvements at the intersection of Martin Luther King Jr. Boulevard (NC 86) and Estes Drive:

- Exclusive northbound right-turn lane with approximately 250 feet of storage and appropriate taper.
- Exclusive southbound right-turn lane with approximately 175 feet of storage and appropriate taper.
- Second westbound left-turn lane with approximately 300 feet of storage and appropriate taper.
- Extension of the exclusive westbound right-turn lane to include approximately 300 feet of storage and appropriate taper.

The lane geometric improvements identified with this project will be included in the future year (2024) analyses. The Town's existing signal timings at the study area signalized intersection will be utilized; however, the signal timing splits will be optimized in the future year (2024) analyses with the roadway improvement project in place.

Trip Generation

Trip Generation will be conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's "Rate vs. Equation" spreadsheet. The proposed development will build up to 361 mid-rise apartments, 58 townhomes/condominiums, 8,564-sf of general retail space, and a 3,032-sf of small office building; ITE LUC 220 (Multifamily Housing (Low-Rise)), LUC 221 (Multifamily Housing (Mid-Rise)), LUC 712 (Small Office Building), and LUC 820 (General Retail) will be used based on the NCDOT guidance. The trip generation results are shown in Table 1 below.

The noon peak hour trips were generated by taking the average of the AM peak hour and PM peak hour site generated trips. The AM peak hour trips for LUC 820 (General Retail) were calculated by taking an average of the rate and equation that is presented within the ITE Trip Generation Manual. The NCDOT recommended method (equation) was not utilized because the high Y-intercept within the equation causes an unrealistically high number of trips to be generated for smaller retail uses. Since the size of this proposed retail development is quite small, the trip generation completed with the equation results in significantly higher peak hour trips (Approximately 153 site trips).

Martin Luther King Jr Boulevard (NC 86) has active transit service with the HS and NS routes running adjacent to the site. Therefore, the total expected site trips will be reduced by 10% to account for trips to the site using transit or an alternative mode instead of driving.

Table 1: Trip Generation Results

Land Use Code ¹	Land Use	Unit	ADT	AM Peak Hour			Noon Peak Hour ⁵			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Total Site Trips ²												
220	Multifamily Housing (Low-Rise)	58 du	398	6	22	28	15	17	32	23	13	36
221	Multifamily Housing (Mid-Rise)	361 du	1,966	31	89	120	62	74	136	93	59	152
712	Small Office Building	3,032 sf	49	6	4	10	6	5	11	5	6	11
820	General Retail	8,564 sf	1,130	51	31	82	47	38	85	42	46	88
Development Total			3,543	94	146	240	130	134	264	163	124	287
Trip Reduction Due to Internal Capture ³												
220	Multifamily Housing (Low-Rise)	58 du	23	0	0	0	1	1	2	2	1	3
221	Multifamily Housing (Mid-Rise)	361 du	111	1	1	2	5	3	8	9	5	14
712	Small Office Building	3,032 sf	12	0	1	1	2	1	3	3	1	4
820	General Retail	8,564 sf	120	2	1	3	3	6	9	4	11	15
Development Total			265	3	3	6	11	11	22	18	18	36
Total External Site Trips without Transit Reduction												
220	Multifamily Housing (Low-Rise)	58 du	375	6	22	28	14	16	30	21	12	33
221	Multifamily Housing (Mid-Rise)	361 du	1,855	30	88	118	57	71	128	84	54	138
712	Small Office Building	3,032 sf	37	6	3	9	4	4	8	2	5	7
820	General Retail	8,564 sf	1,010	49	30	79	44	32	76	38	35	73
Development Total			3,277	91	143	234	119	123	242	145	106	251
Total External Site Trips with 10% Transit Reduction												
220	Multifamily Housing (Low-Rise)	58 du	338	5	20	25	13	14	27	19	11	30
221	Multifamily Housing (Mid-Rise)	361 du	1,670	27	79	106	51	64	115	76	49	125
712	Small Office Building	3,032 sf	33	5	3	8	4	4	8	2	5	7
820	General Retail	8,564 sf	909	44	27	71	40	29	69	34	32	66
Development Total			2,950	81	129	210	108	111	219	131	97	228
Total External Pass-by Site Trips ⁴												
220	Multifamily Housing (Low-Rise)	58 du		0	0	0	0	0	0	0	0	0
221	Multifamily Housing (Mid-Rise)	361 du		0	0	0	0	0	0	0	0	0
712	Small Office Building	3,032 sf		0	0	0	0	0	0	0	0	0
820	General Retail	8,564 sf		0	0	0	0	0	0	11	11	22
Development Total				0	0	0	0	0	0	11	11	22
Total External Non-Pass-by Site Trips												
220	Multifamily Housing (Low-Rise)	58 du		5	20	25	13	14	27	19	11	30
221	Multifamily Housing (Mid-Rise)	361 du		27	79	106	51	64	115	76	49	125
712	Small Office Building	3,032 sf		5	3	8	4	4	8	2	5	7
820	General Retail	8,564 sf		44	27	71	40	29	69	23	21	44
Development Total				81	129	210	108	111	219	120	86	206

Notes:

1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 10th Edition*.
2. Total site trips are determined based on the suggested method in the NCDOT Rate vs Equation Spreadsheet.
3. Internal capture was based on NCHRP 684 method and NCDOT IC calculation spreadsheet (1,000 ft maximum between uses).
4. Unconstrained pass-by trips are calculated based on *ITE Trip Generation Handbook, 3rd Edition*. The final projections are not expected to exceed 10% of adjacent street volumes.
5. Noon peak hour trips assumed to be an average of the AM and PM peak hour trips.

As shown in Table 1, the proposed Aura Chapel Hill Development is projected to generate up to 2,950 external daily site trips with 210 trips (81 entering, 129 exiting) occurring in the AM peak hour, 219 trips (108 entering, 111 exiting) occurring during the noon peak hour, and 228 trips (131 entering, 97 exiting) occurring in the PM peak hour.

Trip Distribution and Assignment

The generated site trips will be distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area as follows:

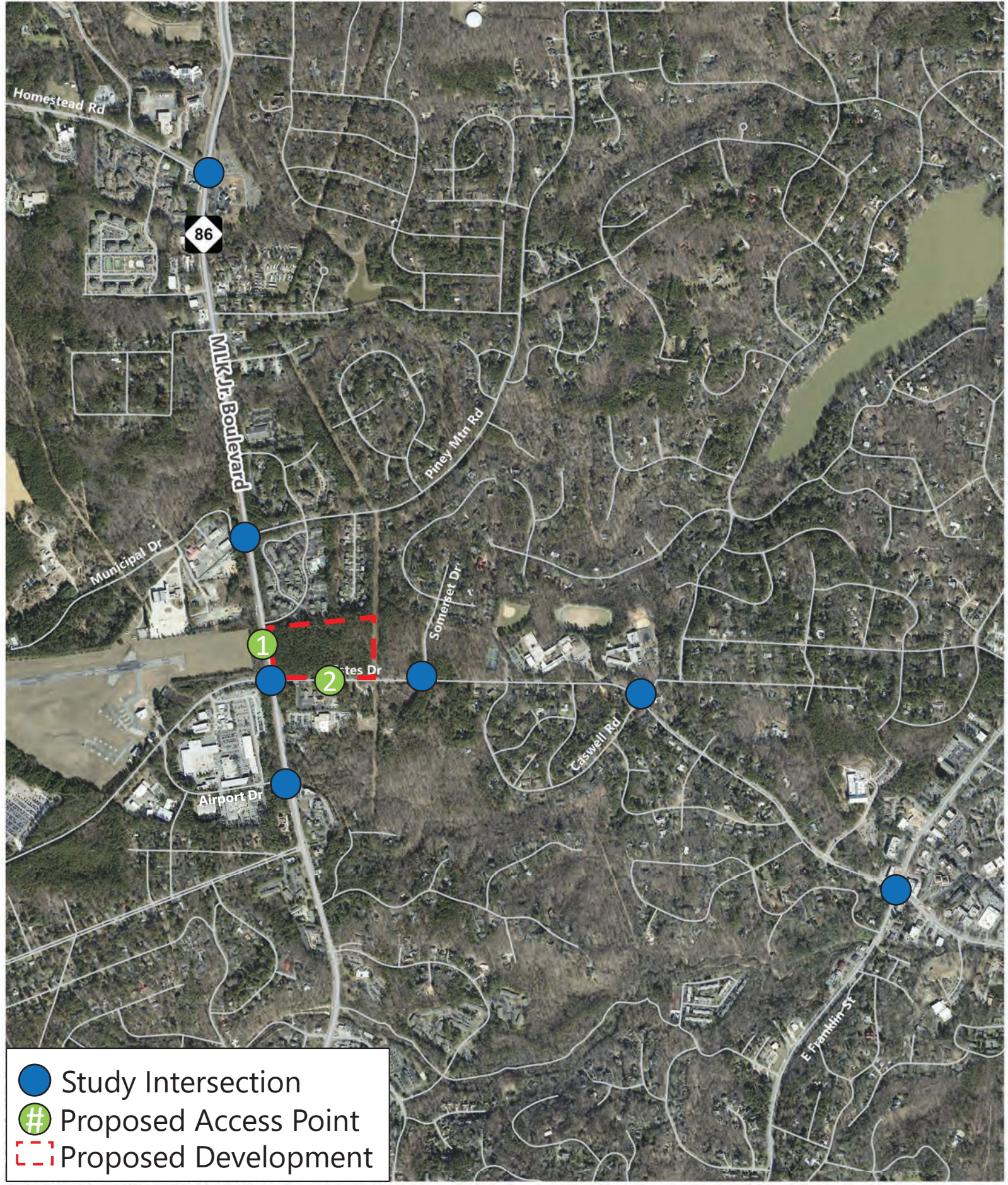
- Martin Luther King Jr. Boulevard (NC 86) from/to the north – 25%
- Martin Luther King Jr. Boulevard (NC 86) from/to the south – 15%

940 Main Campus Drive
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- Estes Drive (SR 1780) from/to the west – 10%
- Estes Drive (SR 1750) from/to the east – 13%
- Franklin Street (SR 1010) from/to the north – 15%
- Franklin Street (SR 1010) from/to the south – 10%
- Homestead Road (SR 1777) from/to the west – 6%
- Piney Mountain Road from/to the east – 3%
- Caswell Road from/to the north – 1%
- Caswell Road from/to the south – 1%
- Somerset Drive from/to the north – 1%

Pass-by trips for the site were distributed along Estes Drive and Martin Luther King Jr. Boulevard (NC 86) based on existing traffic patterns observed in the area. The proposed non-pass-by and pass-by trip distribution percentages are displayed in Figure MOU-4 and Figure MOU-5, respectively.





- Study Intersection
- # Proposed Access Point
- ▭ Proposed Development



Project Area | MLK Boulevard TIA

Figure MOU- 1
Vicinity Map



LEGEND	
	Existing Roadway
	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
	Turning Movement

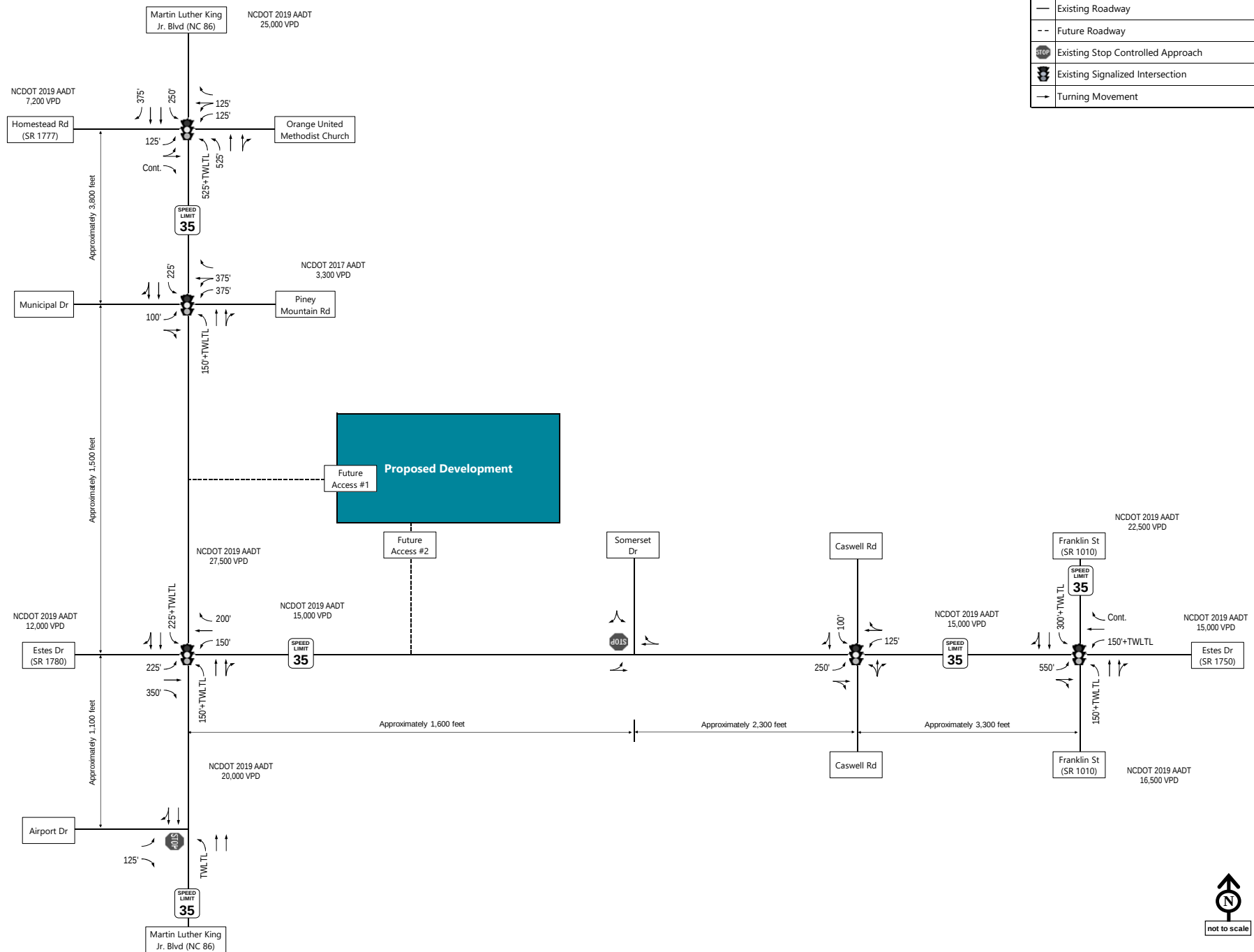


Figure MOU-2
Existing (2020) Lane Geometrics and Traffic Control

Aura Chapel Hill Development
Chapel Hill, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

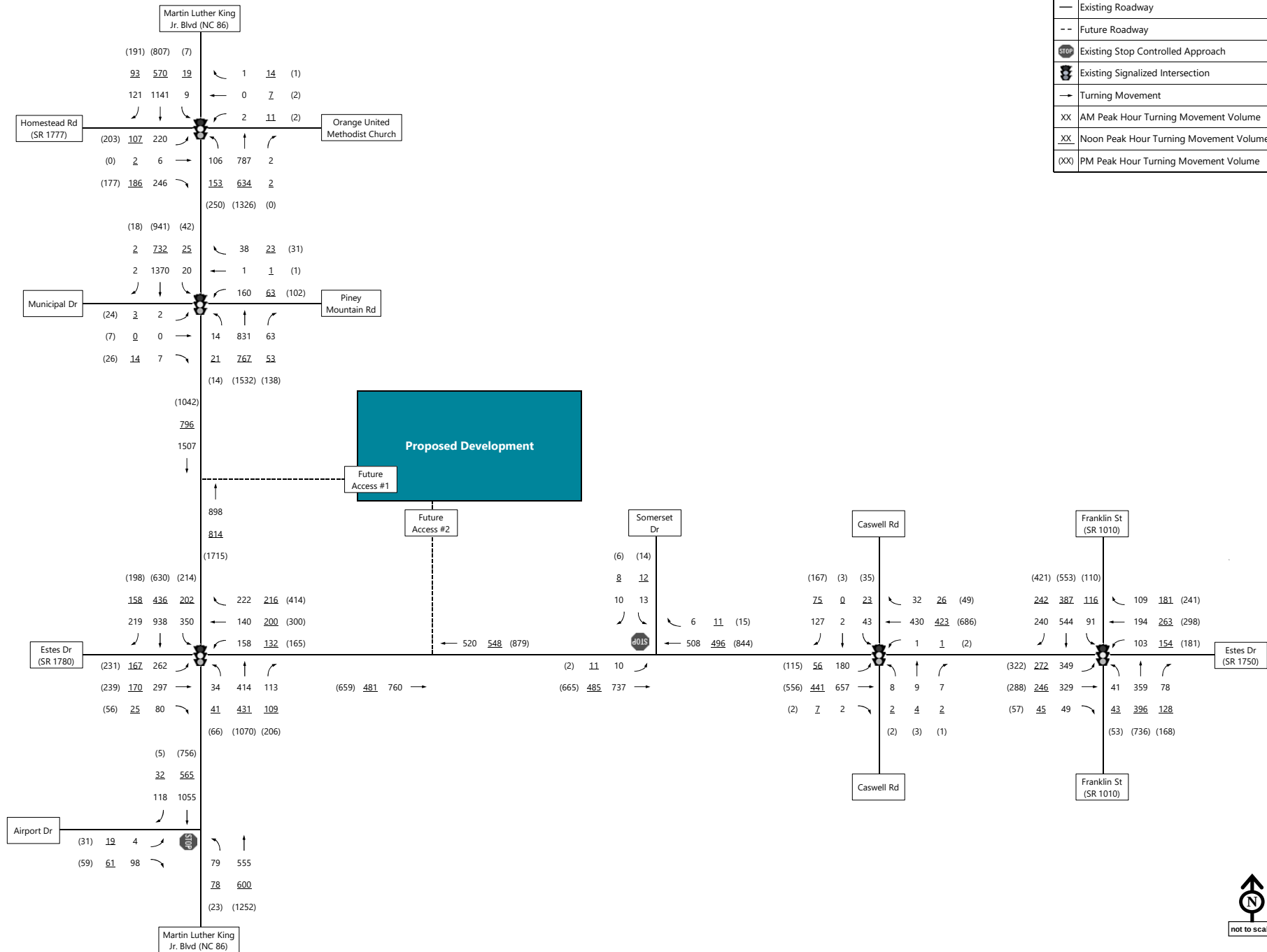


Figure MOU-3
Existing (2020) AM and PM Peak Hour Turning Movement Volumes

Aura Chapel Hill Development
Chapel Hill, NC

LEGEND	
	Existing Roadway
	Future Roadway
	Existing Stop Controlled Approach
	Proposed Stop Controlled Approach
	Existing Signalized Intersection
	Turning Movement
	Entering Peak Hour Trip Distribution Percentage
	Exiting Peak Hour Trip Distribution Percentage

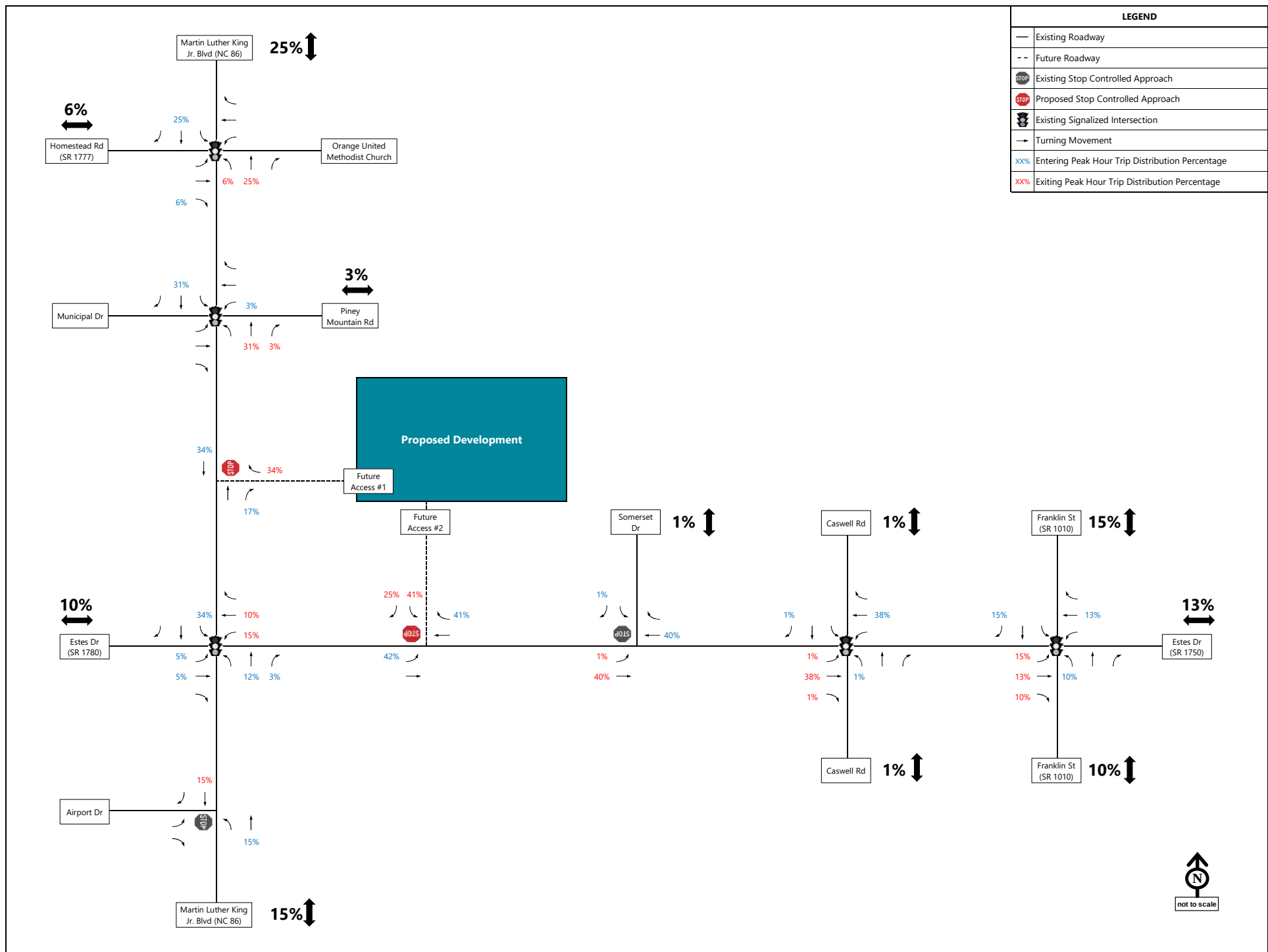
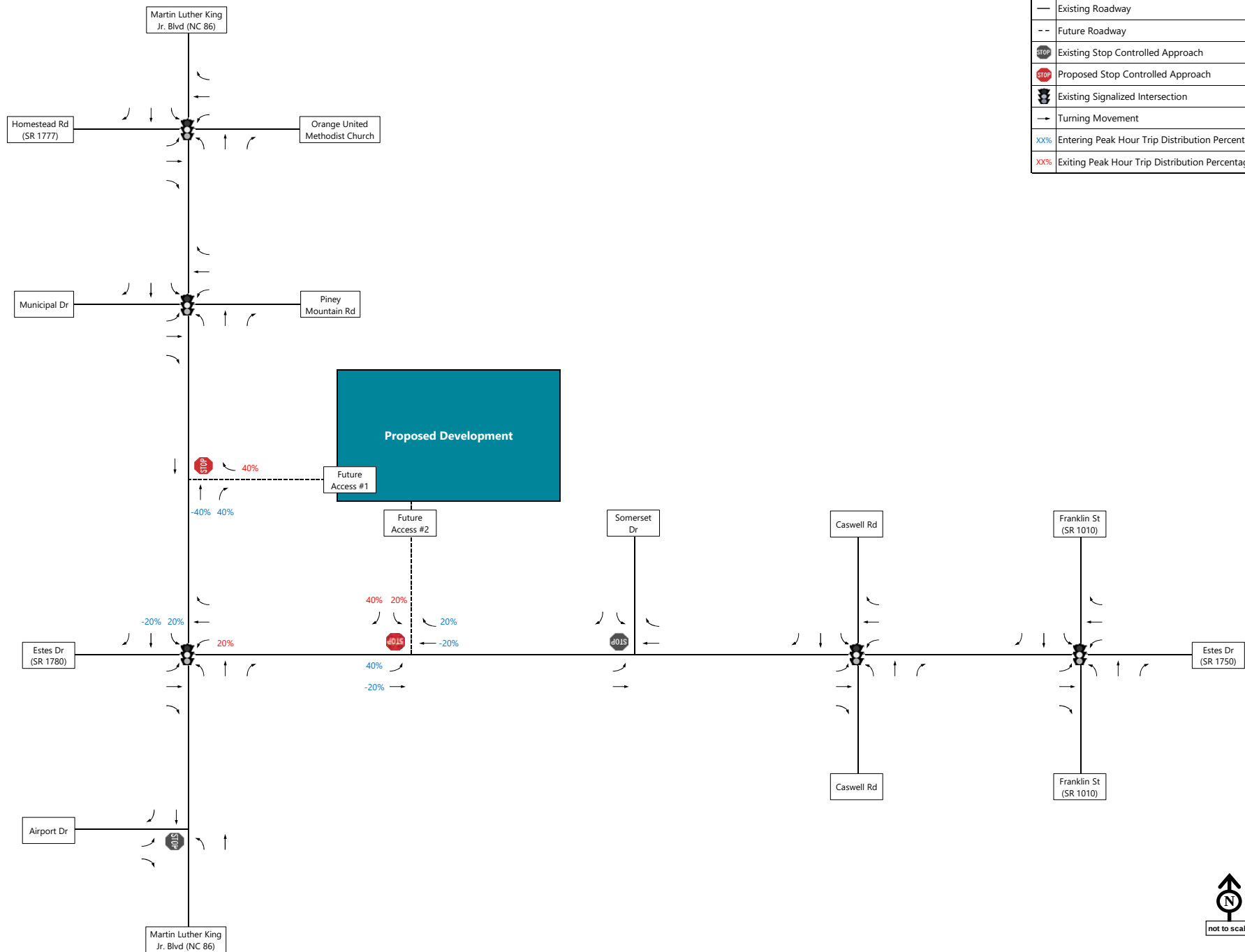


Figure MOU-4
Non-Pass-By Site Trip Distribution Percentages

Aura Chapel Hill Development
Chapel Hill, NC

LEGEND	
	Existing Roadway
	Future Roadway
	Existing Stop Controlled Approach
	Proposed Stop Controlled Approach
	Existing Signalized Intersection
	Turning Movement
	Entering Peak Hour Trip Distribution Percentage
	Exiting Peak Hour Trip Distribution Percentage



B

Turning Movement Counts

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Venture I
940 Main Campus Drive, Suite 500
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File Name : Estes@Caswell
Site Code :
Start Date : 1/28/2020
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

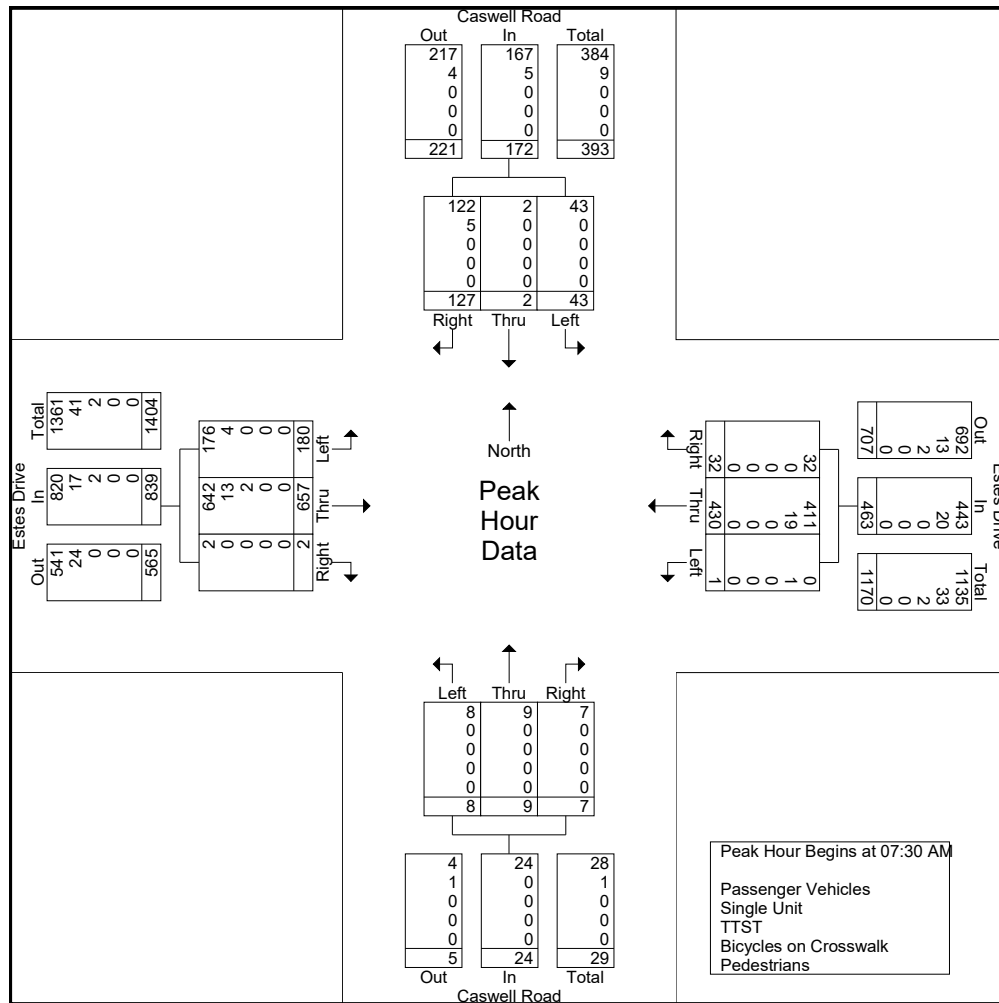
	Caswell Road Southbound				Estes Drive Westbound				Caswell Road Northbound				Estes Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	4	0	8	1	0	52	9	0	1	1	1	0	18	60	0	2	3	154	157
07:15 AM	6	0	20	0	0	68	13	0	0	1	1	0	28	107	0	0	0	244	244
07:30 AM	18	2	44	3	0	89	19	0	1	3	1	1	62	146	0	10	14	385	399
07:45 AM	11	0	31	1	0	126	6	0	0	1	1	0	40	149	0	7	8	365	373
Total	39	2	103	5	0	335	47	0	2	6	4	1	148	462	0	19	25	1148	1173
08:00 AM	8	0	30	3	1	133	4	0	6	1	2	1	37	184	1	4	8	407	415
08:15 AM	6	0	22	1	0	82	3	0	1	4	3	0	41	178	1	0	1	341	342
08:30 AM	8	1	16	0	0	84	9	0	2	1	1	1	12	131	0	0	1	265	266
08:45 AM	12	1	14	1	0	86	8	0	0	0	4	0	19	130	0	0	1	274	275
Total	34	2	82	5	1	385	24	0	9	6	10	2	109	623	2	4	11	1287	1298
*** BREAK ***																			
11:00 AM	4	0	15	0	1	84	5	0	0	0	1	0	11	102	2	0	0	225	225
11:15 AM	5	0	19	1	0	112	4	0	0	1	0	0	12	103	0	0	1	256	257
11:30 AM	4	0	24	1	1	92	8	0	1	0	1	0	17	98	1	0	1	247	248
11:45 AM	6	0	15	1	0	113	7	0	1	1	0	0	14	128	1	0	1	286	287
Total	19	0	73	3	2	401	24	0	2	2	2	0	54	431	4	0	3	1014	1017
12:00 PM	7	0	18	1	0	106	6	0	0	2	1	0	15	104	0	0	1	259	260
12:15 PM	6	0	18	1	0	112	5	0	0	1	0	0	10	111	0	0	1	263	264
12:30 PM	5	0	12	2	1	103	2	0	0	1	1	0	12	108	0	0	2	245	247
12:45 PM	2	1	12	0	0	124	3	0	0	0	0	0	12	127	0	0	0	281	281
Total	20	1	60	4	1	445	16	0	0	4	2	0	49	450	0	0	4	1048	1052
*** BREAK ***																			
04:00 PM	7	0	24	1	0	137	3	0	0	2	1	1	20	131	2	1	3	327	330
04:15 PM	9	1	38	1	0	134	9	0	2	0	0	0	21	150	0	1	2	364	366
04:30 PM	5	1	32	0	1	158	10	0	1	1	2	0	24	138	0	1	1	373	374
04:45 PM	6	1	28	0	0	165	13	1	0	1	0	2	24	154	1	1	4	393	397
Total	27	3	122	2	1	594	35	1	3	4	3	3	89	573	3	4	10	1457	1467
05:00 PM	15	0	43	0	0	168	12	0	0	1	1	0	34	127	2	3	3	403	406
05:15 PM	7	2	45	2	1	177	12	0	0	1	0	0	23	142	3	2	4	413	417
05:30 PM	7	0	51	0	1	176	12	3	2	0	0	0	34	133	1	0	3	417	420
05:45 PM	7	0	35	4	2	166	10	1	3	1	1	0	31	132	0	4	9	388	397
Total	36	2	174	6	4	687	46	4	5	3	2	0	122	534	6	9	19	1621	1640
Grand Total	175	10	614	25	9	2847	192	5	21	25	23	6	571	3073	15	36	72	7575	7647
Apprch %	21.9	1.3	76.8		0.3	93.4	6.3		30.4	36.2	33.3		15.6	84	0.4				
Total %	2.3	0.1	8.1		0.1	37.6	2.5		0.3	0.3	0.3		7.5	40.6	0.2		0.9	99.1	
Passenger Vehicles	174	8	597		8	2785	190		19	24	22		555	3017	15		0	0	7414
% Passenger Vehicles	99.4	80	97.2	0	88.9	97.8	99	0	90.5	96	95.7	0	97.2	98.2	100	0	0	0	97
Single Unit	1	2	17		1	60	2		2	1	1		16	53	0		0	0	156
% Single Unit	0.6	20	2.8	0	11.1	2.1	1	0	9.5	4	4.3	0	2.8	1.7	0	0	0	0	2
TTST	0	0	0		0	2	0		0	0	0		0	3	0		0	0	5
% TTST	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	1
% Bicycles on Crosswalk	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	71
% Pedestrians	0	0	0	96	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0.9

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Estes@Caswell
Site Code :
Start Date : 1/28/2020
Page No : 2

	Caswell Road Southbound				Estes Drive Westbound				Caswell Road Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	18	2	44	64	0	89	19	108	1	3	1	5	62	146	0	208	385
07:45 AM	11	0	31	42	0	126	6	132	0	1	1	2	40	149	0	189	365
08:00 AM	8	0	30	38	1	133	4	138	6	1	2	9	37	184	1	222	407
08:15 AM	6	0	22	28	0	82	3	85	1	4	3	8	41	178	1	220	341
Total Volume	43	2	127	172	1	430	32	463	8	9	7	24	180	657	2	839	1498
% App. Total	25	1.2	73.8		0.2	92.9	6.9		33.3	37.5	29.2		21.5	78.3	0.2		
PHF	.597	.250	.722	.672	.250	.808	.421	.839	.333	.563	.583	.667	.726	.893	.500	.945	.920
Passenger Vehicles	43	2	122	167	0	411	32	443	8	9	7	24	176	642	2	820	1454
% Passenger Vehicles	100	100	96.1	97.1	0	95.6	100	95.7	100	100	100	100	97.8	97.7	100	97.7	97.1
Single Unit	0	0	5	5	1	19	0	20	0	0	0	0	4	13	0	17	42
% Single Unit	0	0	3.9	2.9	100	4.4	0	4.3	0	0	0	0	2.2	2.0	0	2.0	2.8
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0.2	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

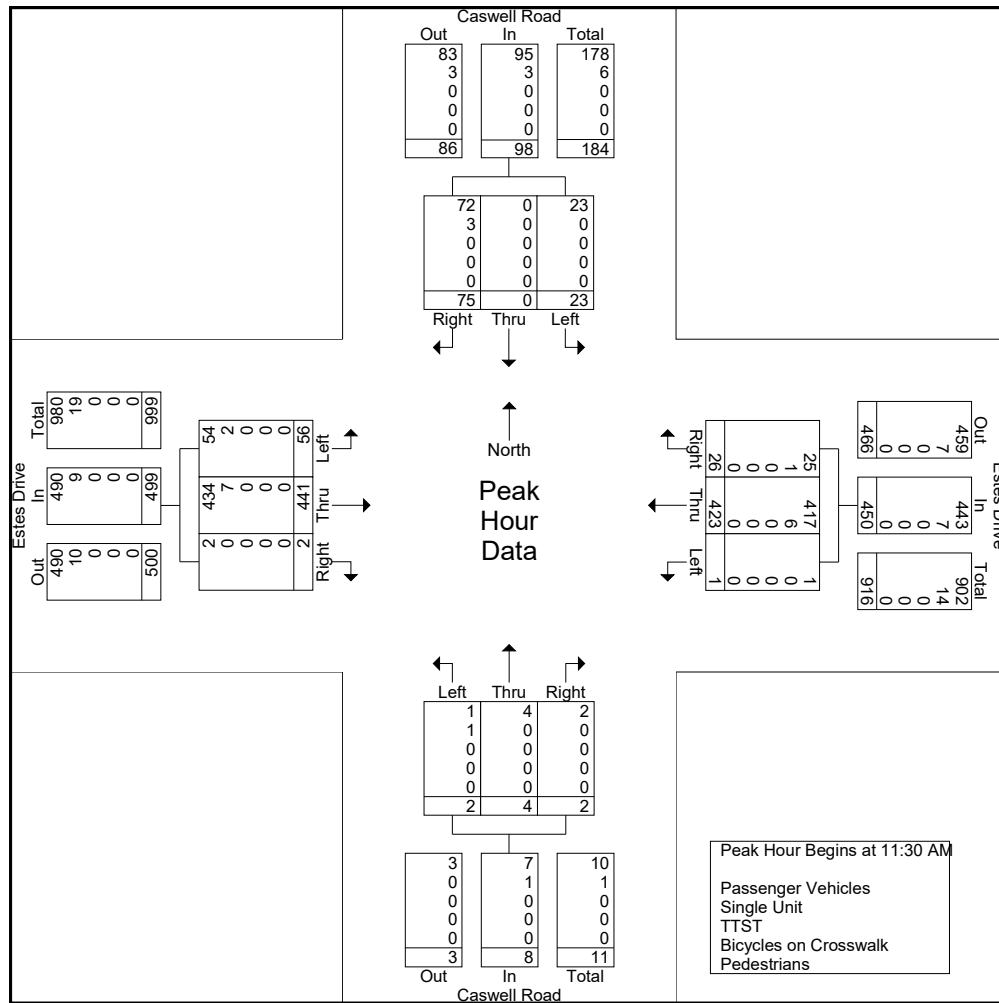
File Name : Estes@Caswell

Site Code :

Start Date : 1/28/2020

Page No : 3

	Caswell Road Southbound				Estes Drive Westbound				Caswell Road Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30 AM																	
11:30 AM	4	0	24	28	1	92	8	101	1	0	1	2	17	98	1	116	247
11:45 AM	6	0	15	21	0	113	7	120	1	1	0	2	14	128	1	143	286
12:00 PM	7	0	18	25	0	106	6	112	0	2	1	3	15	104	0	119	259
12:15 PM	6	0	18	24	0	112	5	117	0	1	0	1	10	111	0	121	263
Total Volume	23	0	75	98	1	423	26	450	2	4	2	8	56	441	2	499	1055
% App. Total	23.5	0	76.5		0.2	94	5.8		25	50	25		11.2	88.4	0.4		
PHF	.821	.000	.781	.875	.250	.936	.813	.938	.500	.500	.500	.667	.824	.861	.500	.872	.922
Passenger Vehicles	23	0	72	95	1	417	25	443	1	4	2	7	54	434	2	490	1035
% Passenger Vehicles	100	0	96.0	96.9	100	98.6	96.2	98.4	50.0	100	100	87.5	96.4	98.4	100	98.2	98.1
Single Unit	0	0	3	3	0	6	1	7	1	0	0	1	2	7	0	9	20
% Single Unit	0	0	4.0	3.1	0	1.4	3.8	1.6	50.0	0	0	12.5	3.6	1.6	0	1.8	1.9
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

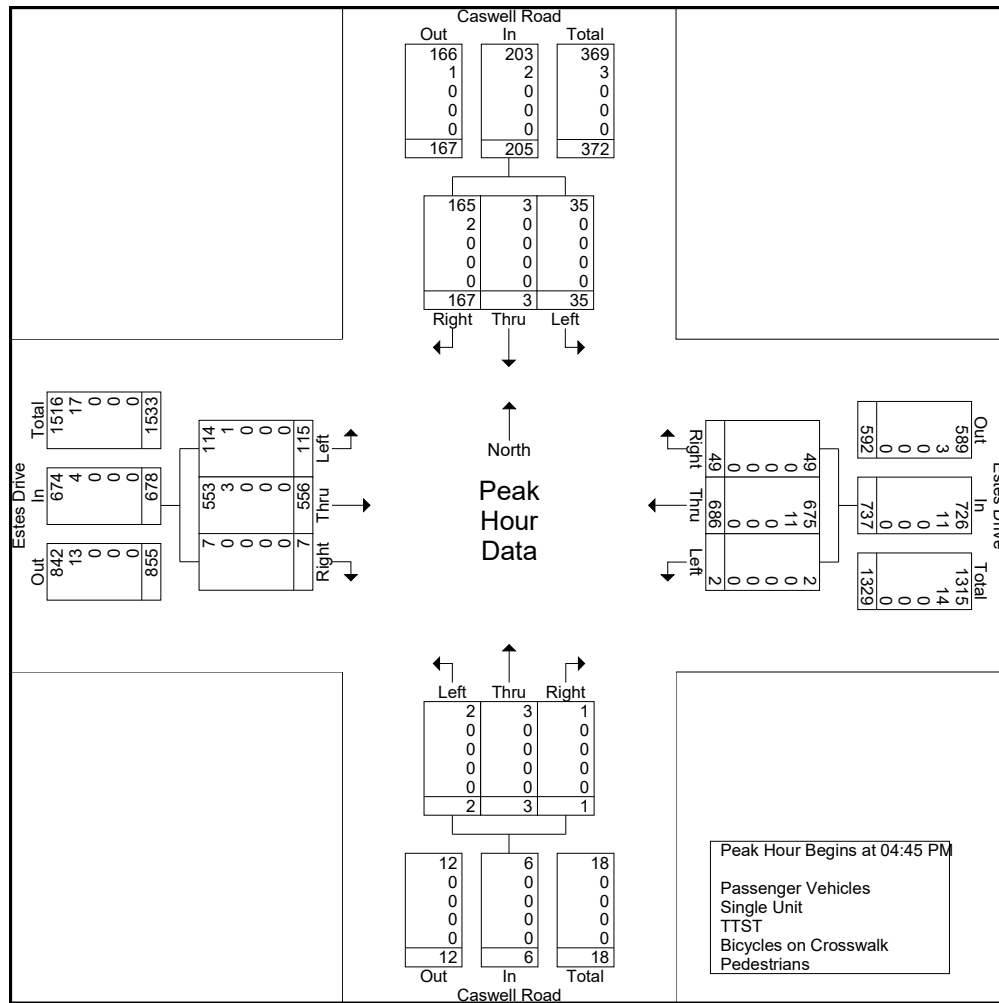


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Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Estes@Caswell
Site Code :
Start Date : 1/28/2020
Page No : 4

	Caswell Road Southbound				Estes Drive Westbound				Caswell Road Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	6	1	28	35	0	165	13	178	0	1	0	1	24	154	1	179	393
05:00 PM	15	0	43	58	0	168	12	180	0	1	1	2	34	127	2	163	403
05:15 PM	7	2	45	54	1	177	12	190	0	1	0	1	23	142	3	168	413
05:30 PM	7	0	51	58	1	176	12	189	2	0	0	2	34	133	1	168	417
Total Volume	35	3	167	205	2	686	49	737	2	3	1	6	115	556	7	678	1626
% App. Total	17.1	1.5	81.5		0.3	93.1	6.6		33.3	50	16.7		17	82	1		
PHF	.583	.375	.819	.884	.500	.969	.942	.970	.250	.750	.250	.750	.846	.903	.583	.947	.975
Passenger Vehicles	35	3	165	203	2	675	49	726	2	3	1	6	114	553	7	674	1609
% Passenger Vehicles	100	100	98.8	99.0	100	98.4	100	98.5	100	100	100	100	99.1	99.5	100	99.4	99.0
Single Unit	0	0	2	2	0	11	0	11	0	0	0	0	1	3	0	4	17
% Single Unit	0	0	1.2	1.0	0	1.6	0	1.5	0	0	0	0	0.9	0.5	0	0.6	1.0
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Estes@Franklin
Site Code :
Start Date : 1/28/2020
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Franklin Street Southbound				Estes Drive Westbound				Franklin Street Northbound				Estes Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	6	62	41	1	17	20	14	1	2	32	5	0	32	38	6	0	2	275	277
07:15 AM	15	85	54	1	11	30	15	2	5	65	16	2	55	36	11	1	6	398	404
07:30 AM	18	124	68	2	21	38	11	0	5	68	22	2	65	79	7	2	6	526	532
07:45 AM	24	133	67	5	25	73	24	1	14	86	20	2	77	74	11	3	11	628	639
Total	63	404	230	9	74	161	64	4	26	251	63	6	229	227	35	6	25	1827	1852
08:00 AM	20	103	61	1	27	50	24	0	10	94	20	0	85	98	15	1	2	607	609
08:15 AM	25	142	56	1	27	34	31	1	10	91	19	0	98	90	16	5	7	639	646
08:30 AM	22	166	56	0	24	37	30	0	7	88	19	1	89	67	7	0	1	612	613
08:45 AM	27	151	57	1	33	47	32	2	12	93	19	0	65	75	9	1	4	620	624
Total	94	562	230	3	111	168	117	3	39	366	77	1	337	330	47	7	14	2478	2492
*** BREAK ***																			
11:00 AM	31	80	46	2	30	42	33	1	12	90	31	1	46	59	8	2	6	508	514
11:15 AM	24	101	57	1	21	57	49	2	6	89	38	0	55	70	8	1	4	575	579
11:30 AM	30	84	52	3	26	48	48	1	8	91	25	1	57	57	9	3	8	535	543
11:45 AM	31	114	59	1	29	80	46	1	11	97	34	0	71	69	13	3	5	654	659
Total	116	379	214	7	106	227	176	5	37	367	128	2	229	255	38	9	23	2272	2295
12:00 PM	32	90	54	5	37	70	31	1	11	88	29	3	72	54	14	3	12	582	594
12:15 PM	34	105	69	1	44	55	53	1	11	111	33	0	57	68	8	1	3	648	651
12:30 PM	19	78	60	2	44	58	51	1	10	100	32	3	72	55	10	1	7	589	596
12:45 PM	45	92	59	3	32	61	57	2	13	86	30	3	65	67	5	0	8	612	620
Total	130	365	242	11	157	244	192	5	45	385	124	9	266	244	37	5	30	2431	2461
*** BREAK ***																			
04:00 PM	33	103	70	2	37	62	58	6	12	148	46	4	58	66	10	4	16	703	719
04:15 PM	37	109	85	9	46	76	41	7	11	141	47	2	76	84	6	5	23	759	782
04:30 PM	26	135	97	3	50	75	48	4	11	140	36	0	81	90	11	1	8	800	808
04:45 PM	27	138	96	1	50	68	59	4	9	145	40	5	86	79	14	3	13	811	824
Total	123	485	348	15	183	281	206	21	43	574	169	11	301	319	41	13	60	3073	3133
05:00 PM	31	129	108	2	38	74	61	7	14	211	29	2	77	69	15	6	17	856	873
05:15 PM	33	138	111	2	42	76	52	2	12	199	37	1	82	72	11	2	7	865	872
05:30 PM	19	148	106	3	51	80	69	4	18	181	62	5	77	68	17	4	16	896	912
05:45 PM	18	152	98	3	50	76	44	7	18	126	40	3	73	60	13	4	17	768	785
Total	101	567	423	10	181	306	226	20	62	717	168	11	309	269	56	16	57	3385	3442
Grand Total	627	2762	1687	55	812	1387	981	58	252	2660	729	40	1671	1644	254	56	209	15466	15675
Apprch %	12.4	54.4	33.2		25.5	43.6	30.8		6.9	73.1	20		46.8	46.1	7.1				
Total %	4.1	17.9	10.9		5.3	9	6.3		1.6	17.2	4.7		10.8	10.6	1.6		1.3	98.7	
Passenger Vehicles	605	2675	1654		795	1355	962		247	2560	714		1652	1608	251		0	0	15078
% Passenger Vehicles	96.5	96.9	98	0	97.9	97.7	98.1	0	98	96.2	97.9	0	98.9	97.8	98.8	0	0	0	96.2
Single Unit	19	87	32		16	32	18		4	94	14		18	35	3		0	0	372
% Single Unit	3	3.1	1.9	0	2	2.3	1.8	0	1.6	3.5	1.9	0	1.1	2.1	1.2	0	0	0	2.4
TTST	3	0	1		1	0	1		1	6	1		1	1	0		0	0	16
% TTST	0.5	0	0.1	0	0.1	0	0.1	0	0.4	0.2	0.1	0	0.1	0.1	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	5
% Bicycles on Crosswalk	0	0	0	1.8	0	0	0	3.4	0	0	0	2.5	0	0	0	1.8	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	204
% Pedestrians	0	0	0	98.2	0	0	0	96.6	0	0	0	97.5	0	0	0	98.2	0	0	1.3

VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

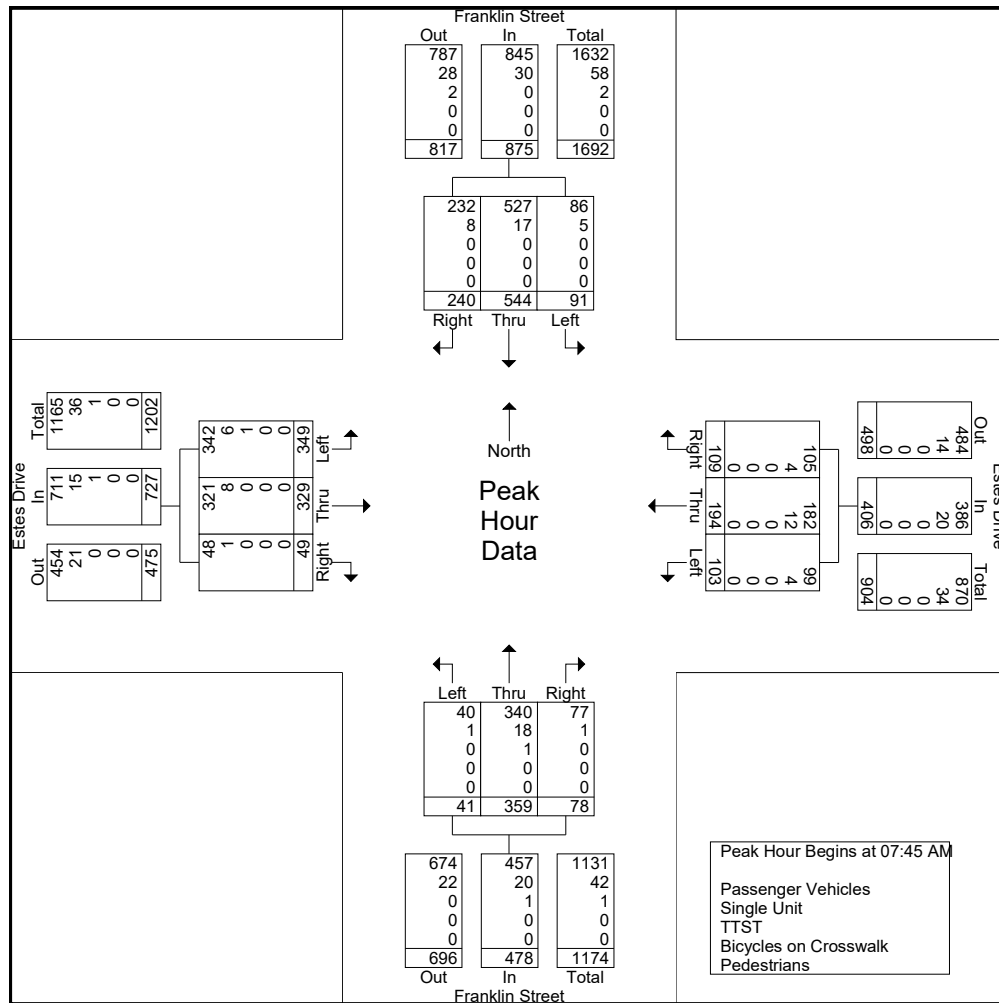
File Name : Estes@Franklin

Site Code :

Start Date : 1/28/2020

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	Franklin Street Southbound				Estes Drive Westbound				Franklin Street Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	24	133	67	224	25	73	24	122	14	86	20	120	77	74	11	162	628
08:00 AM	20	103	61	184	27	50	24	101	10	94	20	124	85	98	15	198	607
08:15 AM	25	142	56	223	27	34	31	92	10	91	19	120	98	90	16	204	639
08:30 AM	22	166	56	244	24	37	30	91	7	88	19	114	89	67	7	163	612
Total Volume	91	544	240	875	103	194	109	406	41	359	78	478	349	329	49	727	2486
% App. Total	10.4	62.2	27.4		25.4	47.8	26.8		8.6	75.1	16.3		48	45.3	6.7		
PHF	.910	.819	.896	.897	.954	.664	.879	.832	.732	.955	.975	.964	.890	.839	.766	.891	.973
Passenger Vehicles	86	527	232	845	99	182	105	386	40	340	77	457	342	321	48	711	2399
% Passenger Vehicles	94.5	96.9	96.7	96.6	96.1	93.8	96.3	95.1	97.6	94.7	98.7	95.6	98.0	97.6	98.0	97.8	96.5
Single Unit	5	17	8	30	4	12	4	20	1	18	1	20	6	8	1	15	85
% Single Unit	5.5	3.1	3.3	3.4	3.9	6.2	3.7	4.9	2.4	5.0	1.3	4.2	1.7	2.4	2.0	2.1	3.4
TTST	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2
% TTST	0	0	0	0	0	0	0	0	0	0.3	0	0.2	0.3	0	0	0.1	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

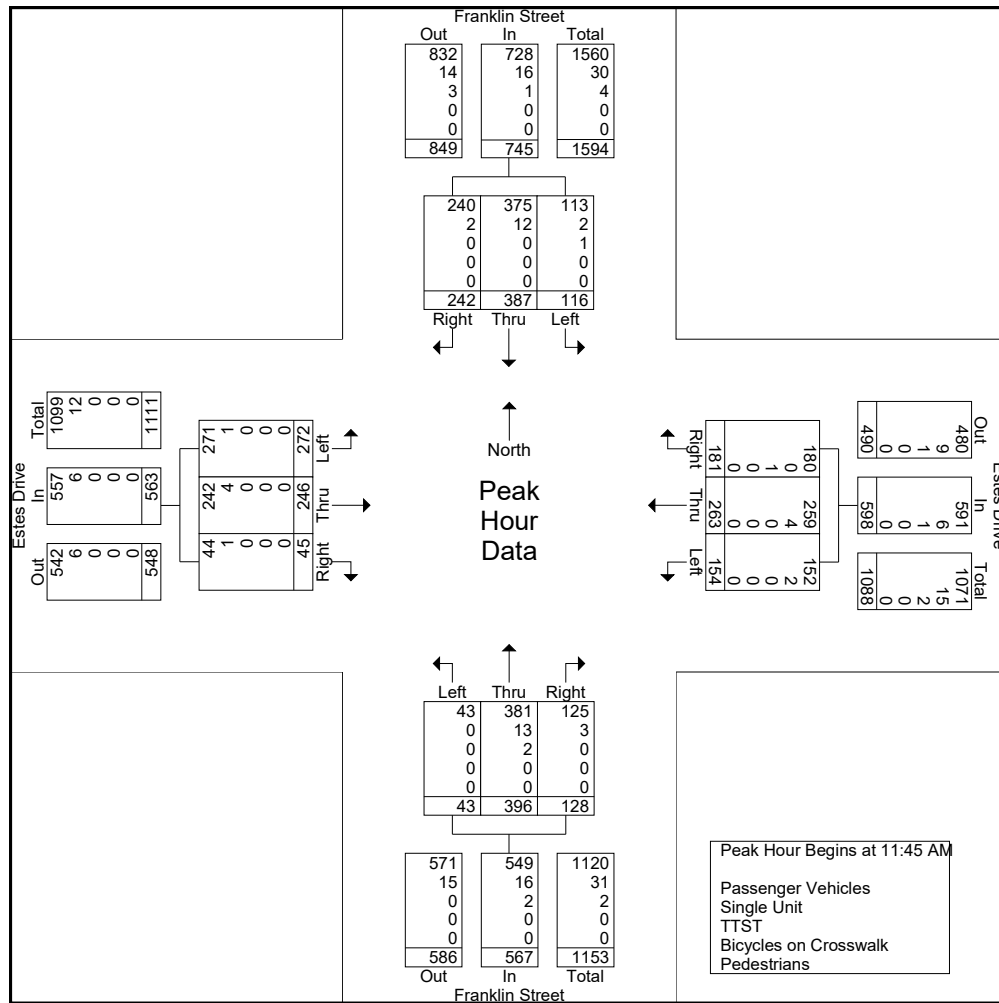


VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Estes@Franklin
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Start Date : 1/28/2020
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	Franklin Street Southbound				Estes Drive Westbound				Franklin Street Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:45 AM																	
11:45 AM	31	114	59	204	29	80	46	155	11	97	34	142	71	69	13	153	654
12:00 PM	32	90	54	176	37	70	31	138	11	88	29	128	72	54	14	140	582
12:15 PM	34	105	69	208	44	55	53	152	11	111	33	155	57	68	8	133	648
12:30 PM	19	78	60	157	44	58	51	153	10	100	32	142	72	55	10	137	589
Total Volume	116	387	242	745	154	263	181	598	43	396	128	567	272	246	45	563	2473
% App. Total	15.6	51.9	32.5		25.8	44	30.3		7.6	69.8	22.6		48.3	43.7	8		
PHF	.853	.849	.877	.895	.875	.822	.854	.965	.977	.892	.941	.915	.944	.891	.804	.920	.945
Passenger Vehicles	113	375	240	728	152	259	180	591	43	381	125	549	271	242	44	557	2425
% Passenger Vehicles	97.4	96.9	99.2	97.7	98.7	98.5	99.4	98.8	100	96.2	97.7	96.8	99.6	98.4	97.8	98.9	98.1
Single Unit	2	12	2	16	2	4	0	6	0	13	3	16	1	4	1	6	44
% Single Unit	1.7	3.1	0.8	2.1	1.3	1.5	0	1.0	0	3.3	2.3	2.8	0.4	1.6	2.2	1.1	1.8
TTST	1	0	0	1	0	0	1	1	0	2	0	2	0	0	0	0	4
% TTST	0.9	0	0	0.1	0	0	0.6	0.2	0	0.5	0	0.4	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

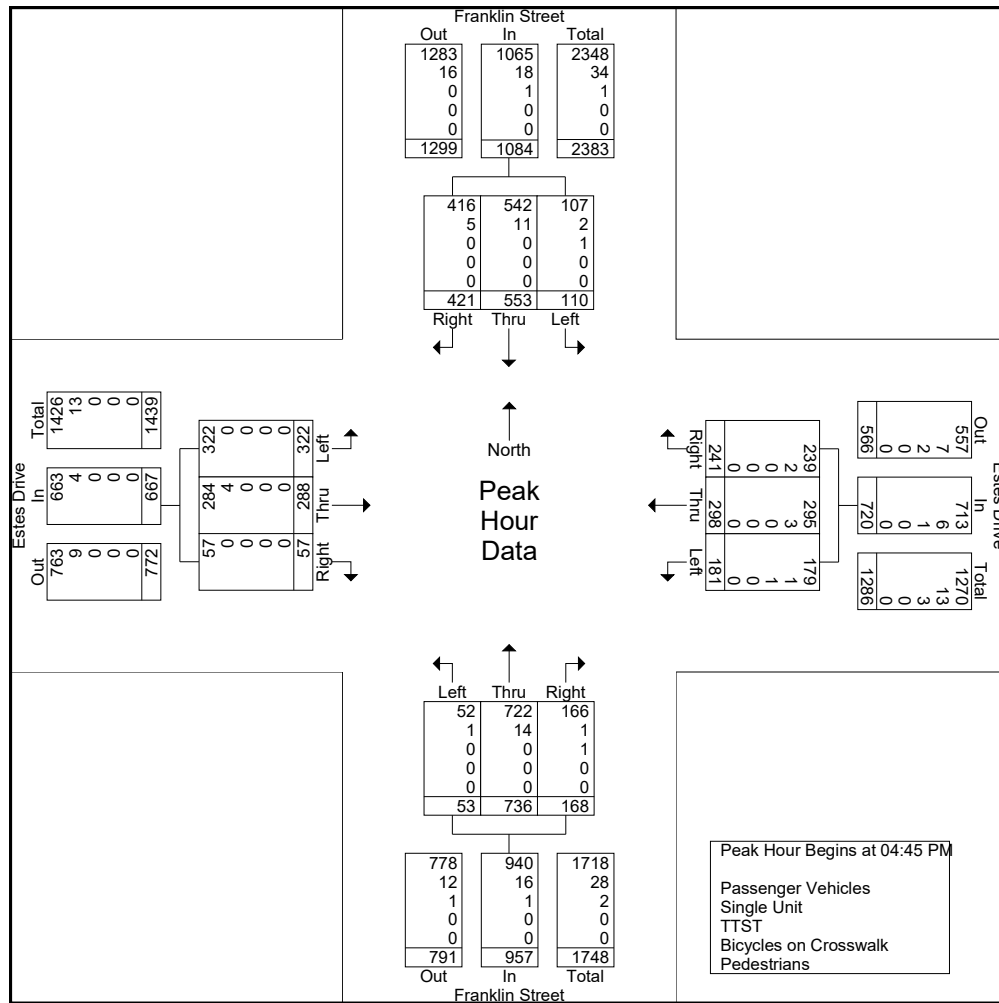
File Name : Estes@Franklin

Site Code :

Start Date : 1/28/2020

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	Franklin Street Southbound				Estes Drive Westbound				Franklin Street Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	27	138	96	261	50	68	59	177	9	145	40	194	86	79	14	179	811
05:00 PM	31	129	108	268	38	74	61	173	14	211	29	254	77	69	15	161	856
05:15 PM	33	138	111	282	42	76	52	170	12	199	37	248	82	72	11	165	865
05:30 PM	19	148	106	273	51	80	69	200	18	181	62	261	77	68	17	162	896
Total Volume	110	553	421	1084	181	298	241	720	53	736	168	957	322	288	57	667	3428
% App. Total	10.1	51	38.8		25.1	41.4	33.5		5.5	76.9	17.6		48.3	43.2	8.5		
PHF	.833	.934	.948	.961	.887	.931	.873	.900	.736	.872	.677	.917	.936	.911	.838	.932	.956
Passenger Vehicles	107	542	416	1065	179	295	239	713	52	722	166	940	322	284	57	663	3381
% Passenger Vehicles	97.3	98.0	98.8	98.2	98.9	99.0	99.2	99.0	98.1	98.1	98.8	98.2	100	98.6	100	99.4	98.6
Single Unit	2	11	5	18	1	3	2	6	1	14	1	16	0	4	0	4	44
% Single Unit	1.8	2.0	1.2	1.7	0.6	1.0	0.8	0.8	1.9	1.9	0.6	1.7	0	1.4	0	0.6	1.3
TTST	1	0	0	1	1	0	0	1	0	0	1	1	0	0	0	0	3
% TTST	0.9	0	0	0.1	0.6	0	0	0.1	0	0	0.6	0.1	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Estes@Somerset
Site Code :
Start Date : 1/28/2020
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Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

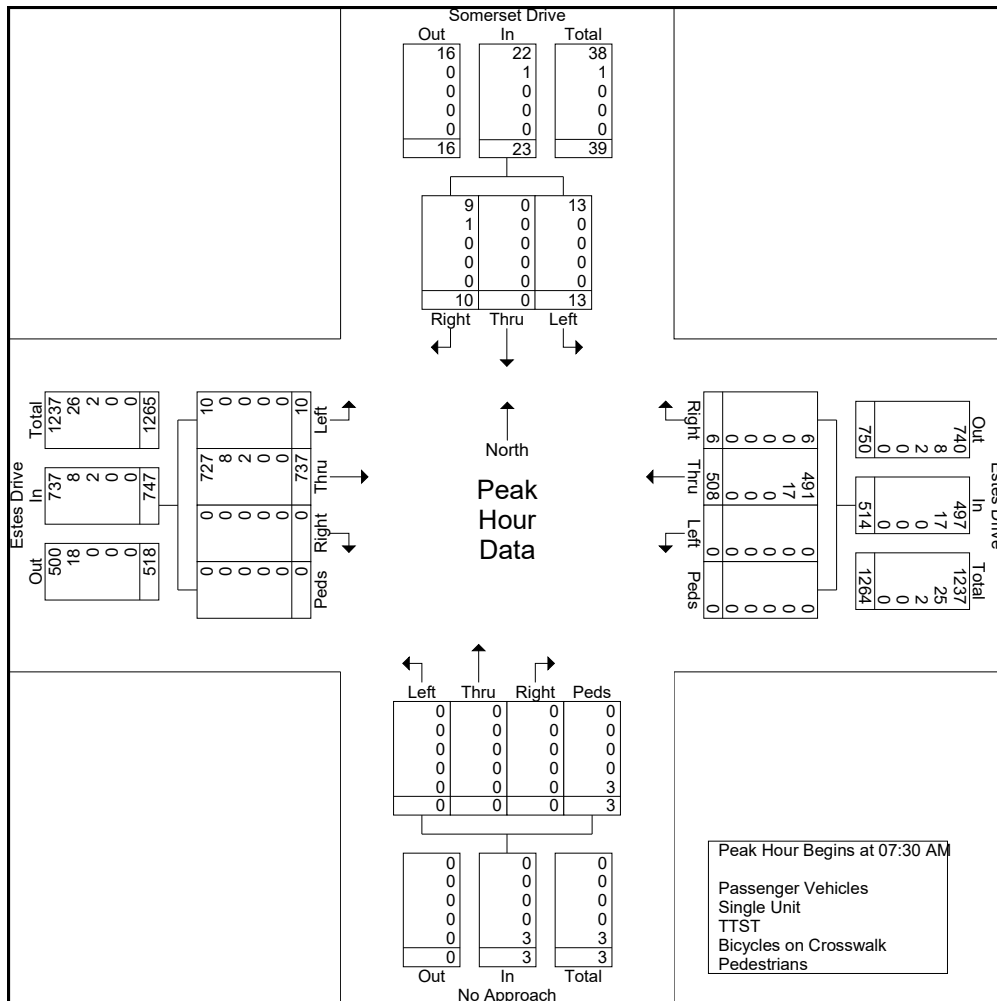
	Somerset Drive Southbound				Estes Drive Westbound				No Approach Northbound				Estes Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	1	0	0	50	5	0	0	0	0	1	1	90	0	0	0	148	148
07:15 AM	5	0	0	0	0	76	3	0	0	0	0	2	3	127	0	0	0	216	216
07:30 AM	5	0	1	0	0	127	2	0	0	0	0	1	1	197	0	0	0	334	334
07:45 AM	3	0	1	0	0	138	0	0	0	0	0	0	3	180	0	0	0	325	325
Total	13	0	3	0	0	391	10	0	0	0	0	4	8	594	0	0	0	1023	1023
08:00 AM	3	0	2	0	0	108	3	0	0	0	0	1	4	181	0	0	0	302	302
08:15 AM	2	0	6	0	0	135	1	0	0	0	0	1	2	179	0	0	0	326	326
08:30 AM	1	0	4	0	0	98	1	0	0	0	0	2	3	141	0	0	0	250	250
08:45 AM	2	0	3	0	0	104	2	0	0	0	0	1	3	145	0	0	0	260	260
Total	8	0	15	0	0	445	7	0	0	0	0	5	12	646	0	0	0	1138	1138
*** BREAK ***																			
11:00 AM	0	0	1	0	0	96	2	0	0	0	0	0	1	118	0	0	0	218	218
11:15 AM	4	0	4	1	0	132	4	0	0	0	0	0	2	107	0	0	1	253	254
11:30 AM	4	0	1	0	0	115	2	0	0	0	0	2	3	122	0	0	0	249	249
11:45 AM	5	0	6	0	0	119	5	0	0	0	0	0	0	132	0	0	0	267	267
Total	13	0	12	1	0	462	13	0	0	0	0	2	6	479	0	0	1	987	988
12:00 PM	6	0	2	0	0	122	6	0	0	0	0	2	1	117	0	0	0	256	256
12:15 PM	2	0	2	0	0	124	1	0	0	0	0	0	3	122	0	0	0	254	254
12:30 PM	1	0	2	0	0	116	2	0	0	0	0	3	4	117	0	0	0	245	245
12:45 PM	3	0	2	0	0	134	2	0	0	0	0	0	3	129	0	0	0	273	273
Total	12	0	8	0	0	496	11	0	0	0	0	5	11	485	0	0	0	1028	1028
*** BREAK ***																			
04:00 PM	3	0	4	1	0	164	1	0	0	0	0	1	1	149	0	0	1	323	324
04:15 PM	1	0	2	0	0	173	3	0	0	0	0	3	2	163	0	0	0	347	347
04:30 PM	2	0	4	0	0	172	2	0	0	0	0	0	4	168	0	0	0	352	352
04:45 PM	3	0	4	0	0	184	1	0	0	0	0	0	3	156	0	0	0	351	351
Total	9	0	14	1	0	693	7	0	0	0	0	4	10	636	0	0	1	1373	1374
05:00 PM	4	0	0	0	0	201	4	0	0	0	0	2	0	160	0	0	0	371	371
05:15 PM	4	0	2	0	0	197	3	0	0	0	0	1	1	168	0	0	0	376	376
05:30 PM	4	0	2	0	0	242	4	0	0	0	0	1	0	160	0	1	0	414	414
05:45 PM	2	0	2	0	0	204	4	0	0	0	0	3	1	177	0	0	0	393	393
Total	14	0	6	0	0	844	15	0	0	0	0	7	2	665	0	1	0	1554	1554
Grand Total	69	0	58	2	0	3331	63	0	0	0	0	27	49	3505	0	1	2	7103	7105
Apprch %	54.3	0	45.7		0	98.1	1.9	0	0	0	0	100	1.4	98.6	0	0			
Total %	1	0	0.8		0	46.9	0.9	0	0	0	0	0.4	0.7	49.3	0	0	0	100	
Passenger Vehicles	68	0	52		0	3252	60	0	0	0	0	0	46	3446	0	0	0	0	6924
% Passenger Vehicles	98.6	0	89.7	0	0	97.6	95.2	0	0	0	0	0	93.9	98.3	0	0	0	0	97.5
Single Unit	1	0	6		0	76	3	0	0	0	0	0	3	54	0	0	0	0	143
% Single Unit	1.4	0	10.3	0	0	2.3	4.8	0	0	0	0	0	6.1	1.5	0	0	0	0	2
TTST	0	0	0		0	3	0	0	0	0	0	0	0	5	0	0	0	0	8
% TTST	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	14.8	0	0	0	0	0	0	0.1
Pedestrians	0	0	0		0	0	0	0	0	0	0	23	0	0	0	1	0	0	26
% Pedestrians	0	0	0	100	0	0	0	0	0	0	0	85.2	0	0	0	100	0	0	0.4

VHB Engineering NC, P.C.

Venture I
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p: 919.829.0328 f: 919.833.0034

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	Somerset Drive Southbound				Estes Drive Westbound					No Approach Northbound					Estes Drive Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 07:30 AM																				
07:30 AM	5	0	1	6	0	127	2	0	129	0	0	0	1	1	1	197	0	0	198	334
07:45 AM	3	0	1	4	0	138	0	0	138	0	0	0	0	0	3	180	0	0	183	325
08:00 AM	3	0	2	5	0	108	3	0	111	0	0	0	1	1	4	181	0	0	185	302
08:15 AM	2	0	6	8	0	135	1	0	136	0	0	0	1	1	2	179	0	0	181	326
Total Volume	13	0	10	23	0	508	6	0	514	0	0	0	3	3	10	737	0	0	747	1287
% App. Total	56.5	0	43.5		0	98.8	1.2	0		0	0	0	100		1.3	98.7	0	0		
PHF	.650	.000	.417	.719	.000	.920	.500	.000	.931	.000	.000	.000	.750	.750	.625	.935	.000	.000	.943	.963
Passenger Vehicles	13	0	9	22	0	491	6	0	497	0	0	0	0	0	10	727	0	0	737	1256
% Passenger Vehicles																				
Single Unit	0	0	1	1	0	17	0	0	17	0	0	0	0	0	0	8	0	0	8	26
% Single Unit	0	0	10.0	4.3	0	3.3	0	0	3.3	0	0	0	0	0	0	1.1	0	0	1.1	2.0
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	3
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0.2



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Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

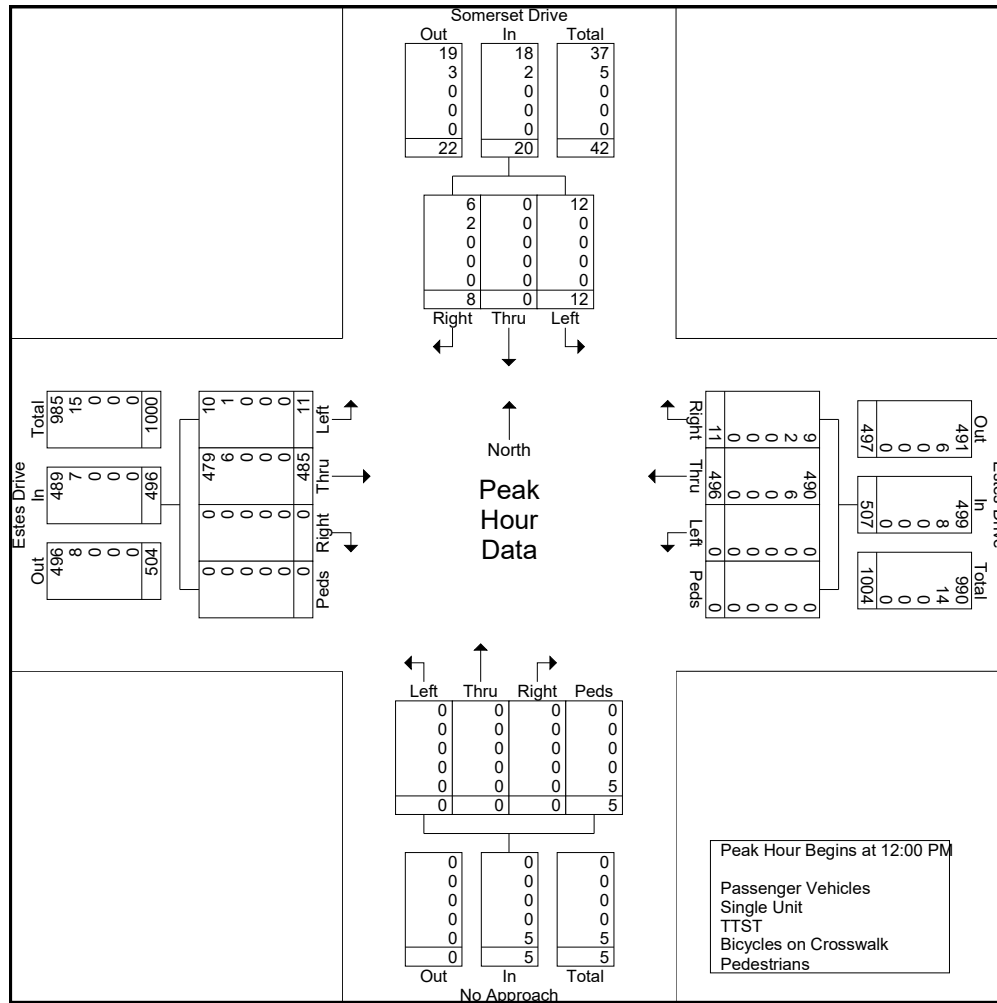
File Name : Estes@Somerset

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	Somerset Drive Southbound				Estes Drive Westbound					No Approach Northbound					Estes Drive Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 12:00 PM																				
12:00 PM	6	0	2	8	0	122	6	0	128	0	0	0	2	2	1	117	0	0	118	256
12:15 PM	2	0	2	4	0	124	1	0	125	0	0	0	0	0	3	122	0	0	125	254
12:30 PM	1	0	2	3	0	116	2	0	118	0	0	0	3	3	4	117	0	0	121	245
12:45 PM	3	0	2	5	0	134	2	0	136	0	0	0	0	0	3	129	0	0	132	273
Total Volume	12	0	8	20	0	496	11	0	507	0	0	0	5	5	11	485	0	0	496	1028
% App. Total	60	0	40		0	97.8	2.2	0		0	0	0	100		2.2	97.8	0	0		
PHF	.500	.000	1.00	.625	.000	.925	.458	.000	.932	.000	.000	.000	.417	.417	.688	.940	.000	.000	.939	.941
Passenger Vehicles	12	0	6	18	0	490	9	0	499	0	0	0	0	0	10	479	0	0	489	1006
% Passenger Vehicles																				
Single Unit	0	0	2	2	0	6	2	0	8	0	0	0	0	0	1	6	0	0	7	17
% Single Unit	0	0	25.0	10.0	0	1.2	18.2	0	1.6	0	0	0	0	0	9.1	1.2	0	0	1.4	1.7
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	5
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0.5



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

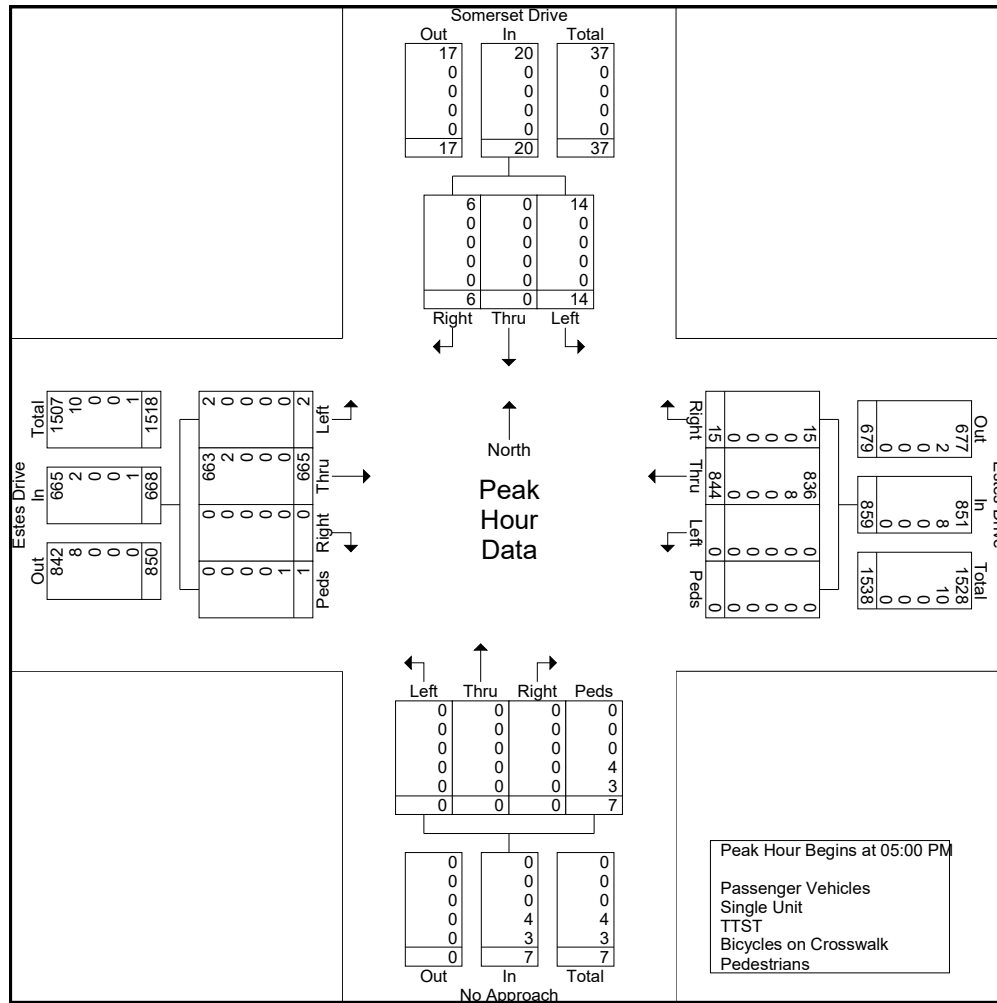
File Name : Estes@Somerset

Site Code :

Start Date : 1/28/2020

Page No : 4

	Somerset Drive Southbound				Estes Drive Westbound					No Approach Northbound					Estes Drive Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 05:00 PM																				
05:00 PM	4	0	0	4	0	201	4	0	205	0	0	0	2	2	0	160	0	0	160	371
05:15 PM	4	0	2	6	0	197	3	0	200	0	0	0	1	1	1	168	0	0	169	376
05:30 PM	4	0	2	6	0	242	4	0	246	0	0	0	1	1	0	160	0	1	161	414
05:45 PM	2	0	2	4	0	204	4	0	208	0	0	0	3	3	1	177	0	0	178	393
Total Volume	14	0	6	20	0	844	15	0	859	0	0	0	7	7	2	665	0	1	668	1554
% App. Total	70	0	30		0	98.3	1.7	0		0	0	0	100		0.3	99.6	0	0.1		
PHF	.875	.000	.750	.833	.000	.872	.938	.000	.873	.000	.000	.000	.583	.583	.500	.939	.000	.250	.938	.938
Passenger Vehicles	14	0	6	20	0	836	15	0	851	0	0	0	0	0	2	663	0	0	665	1536
% Passenger Vehicles																				
Single Unit	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	2	0	0	2	10
% Single Unit	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	0	0.3	0	0	0.3	0.6
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	4
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	57.1	57.1	0	0	0	0	0	0.3
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	1	1	4
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	42.9	42.9	0	0	0	100	0.1	0.3



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Airport
Site Code :
Start Date : 1/28/2020
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Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

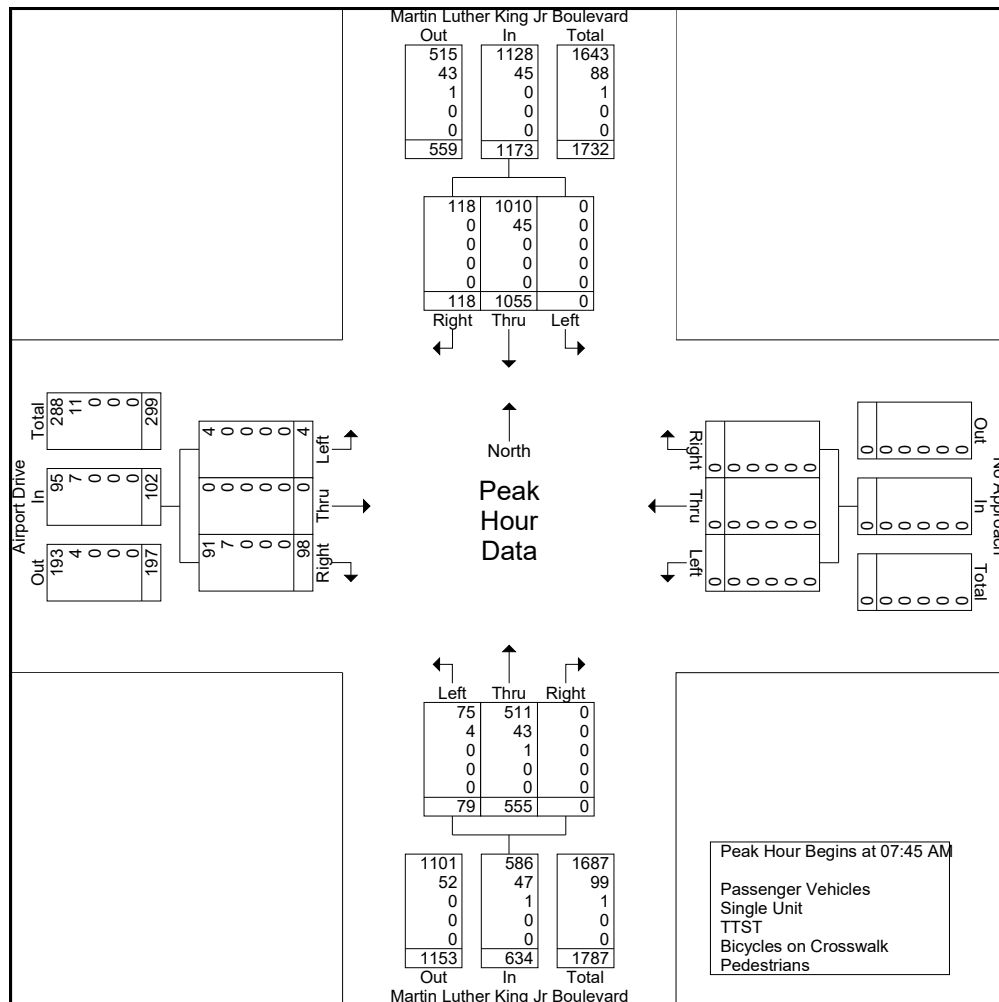
	Martin Luther King Jr Boulevard Southbound				No Approach Westbound				Martin Luther King Jr Boulevard Northbound				Airport Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	179	11	0	0	0	0	1	13	91	0	0	2	0	9	0	1	305	306
07:15 AM	0	174	14	1	0	0	0	1	11	86	0	0	0	0	17	0	2	302	304
07:30 AM	0	279	33	3	0	0	0	2	12	134	0	0	3	0	18	1	6	479	485
07:45 AM	0	267	33	3	0	0	0	0	22	137	0	0	2	0	16	1	4	477	481
Total	0	899	91	7	0	0	0	4	58	448	0	0	7	0	60	2	13	1563	1576
08:00 AM	0	252	31	1	0	0	0	0	20	136	0	0	1	0	25	0	1	465	466
08:15 AM	0	251	32	1	0	0	0	1	17	152	0	0	0	0	27	0	2	479	481
08:30 AM	0	285	22	3	0	0	0	1	20	130	0	0	1	0	30	1	5	488	493
08:45 AM	0	296	23	3	0	0	0	1	15	105	0	0	1	0	23	0	4	463	467
Total	0	1084	108	8	0	0	0	3	72	523	0	0	3	0	105	1	12	1895	1907
*** BREAK ***																			
11:00 AM	0	102	2	0	0	0	0	1	18	137	0	0	4	0	29	0	1	292	293
11:15 AM	0	136	3	4	0	0	0	1	13	118	0	0	4	0	26	0	5	300	305
11:30 AM	0	128	3	4	0	0	0	2	15	123	0	0	8	0	17	0	6	294	300
11:45 AM	0	133	6	0	0	0	0	0	14	153	0	0	11	0	20	1	1	337	338
Total	0	499	14	8	0	0	0	4	60	531	0	0	27	0	92	1	13	1223	1236
12:00 PM	0	151	7	4	0	0	0	3	19	150	0	0	8	0	16	0	7	351	358
12:15 PM	0	136	5	2	0	0	0	1	22	151	0	0	2	0	18	0	3	334	337
12:30 PM	0	128	9	0	0	0	0	2	20	153	0	0	6	0	12	0	2	328	330
12:45 PM	0	150	11	0	0	0	0	0	17	146	0	0	3	0	15	0	0	342	342
Total	0	565	32	6	0	0	0	6	78	600	0	0	19	0	61	0	12	1355	1367
*** BREAK ***																			
04:00 PM	0	147	5	2	0	0	0	3	31	251	0	0	19	0	15	1	6	468	474
04:15 PM	0	152	7	9	0	0	0	0	18	262	0	0	18	0	10	3	12	467	479
04:30 PM	0	160	6	0	0	0	0	5	11	281	0	0	34	0	29	0	5	521	526
04:45 PM	0	182	3	4	0	0	0	6	10	283	0	0	7	0	22	1	11	507	518
Total	0	641	21	15	0	0	0	14	70	1077	0	0	78	0	76	5	34	1963	1997
05:00 PM	0	176	2	3	0	0	0	1	4	327	0	0	11	0	21	3	7	541	548
05:15 PM	0	196	0	3	0	0	0	2	3	332	0	0	7	0	7	0	5	545	550
05:30 PM	0	202	0	2	0	0	0	1	6	310	0	0	6	0	9	0	3	533	536
05:45 PM	0	189	1	3	0	0	0	2	5	252	0	0	3	0	16	0	5	466	471
Total	0	763	3	11	0	0	0	6	18	1221	0	0	27	0	53	3	20	2085	2105
Grand Total	0	4451	269	55	0	0	0	37	356	4400	0	0	161	0	447	12	104	10084	10188
Apprch %	0	94.3	5.7		0	0	0		7.5	92.5	0		26.5	0	73.5				
Total %	0	44.1	2.7		0	0	0		3.5	43.6	0		1.6	0	4.4		1	99	
Passenger Vehicles	0	4258	268		0	0	0		334	4215	0		159	0	420		0	0	9654
% Passenger Vehicles	0	95.7	99.6	0	0	0	0	0	93.8	95.8	0	0	98.8	0	94	0	0	0	94.8
Single Unit	0	192	0		0	0	0		21	178	0		1	0	27		0	0	419
% Single Unit	0	4.3	0	0	0	0	0	0	5.9	4	0	0	0.6	0	6	0	0	0	4.1
TTST	0	1	1		0	0	0		1	7	0		1	0	0		0	0	11
% TTST	0	0	0.4	0	0	0	0	0	0.3	0.2	0	0	0.6	0	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	8
% Bicycles on Crosswalk	0	0	0	3.6	0	0	0	16.2	0	0	0	0	0	0	0	0	0	0	0.1
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	96
% Pedestrians	0	0	0	96.4	0	0	0	83.8	0	0	0	0	0	0	0	100	0	0	0.9

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Airport
Site Code :
Start Date : 1/28/2020
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	Martin Luther King Jr Boulevard Southbound				No Approach Westbound				Martin Luther King Jr Boulevard Northbound				Airport Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	267	33	300	0	0	0	0	22	137	0	159	2	0	16	18	477
08:00 AM	0	252	31	283	0	0	0	0	20	136	0	156	1	0	25	26	465
08:15 AM	0	251	32	283	0	0	0	0	17	152	0	169	0	0	27	27	479
08:30 AM	0	285	22	307	0	0	0	0	20	130	0	150	1	0	30	31	488
Total Volume	0	1055	118	1173	0	0	0	0	79	555	0	634	4	0	98	102	1909
% App. Total	0	89.9	10.1		0	0	0		12.5	87.5	0		3.9	0	96.1		
PHF	.000	.925	.894	.955	.000	.000	.000	.000	.898	.913	.000	.938	.500	.000	.817	.823	.978
Passenger Vehicles	0	1010	118	1128	0	0	0	0	75	511	0	586	4	0	91	95	1809
% Passenger Vehicles	0	95.7	100	96.2	0	0	0	0	94.9	92.1	0	92.4	100	0	92.9	93.1	94.8
Single Unit	0	45	0	45	0	0	0	0	4	43	0	47	0	0	7	7	99
% Single Unit	0	4.3	0	3.8	0	0	0	0	5.1	7.7	0	7.4	0	0	7.1	6.9	5.2
TTST	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% TTST	0	0	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

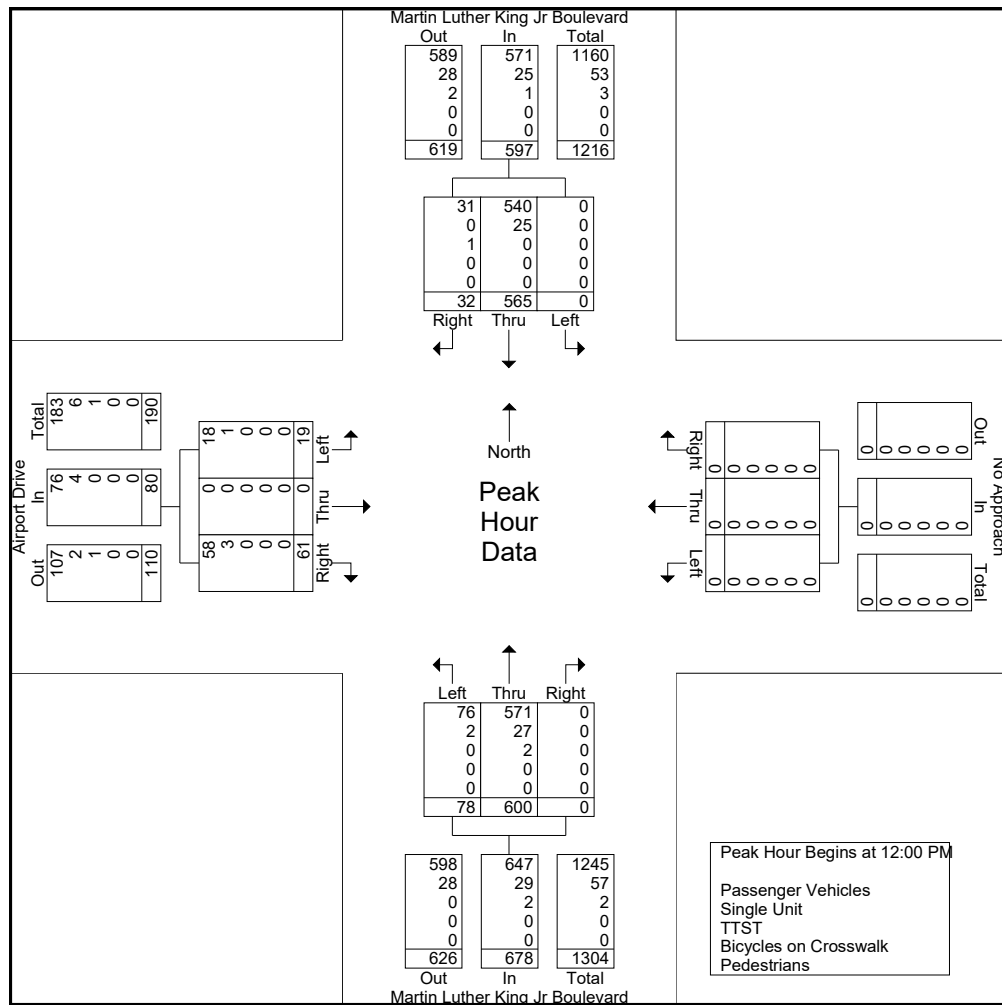


VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Airport
Site Code :
Start Date : 1/28/2020
Page No : 3

	Martin Luther King Jr Boulevard Southbound				No Approach Westbound				Martin Luther King Jr Boulevard Northbound				Airport Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	151	7	158	0	0	0	0	19	150	0	169	8	0	16	24	351
12:15 PM	0	136	5	141	0	0	0	0	22	151	0	173	2	0	18	20	334
12:30 PM	0	128	9	137	0	0	0	0	20	153	0	173	6	0	12	18	328
12:45 PM	0	150	11	161	0	0	0	0	17	146	0	163	3	0	15	18	342
Total Volume	0	565	32	597	0	0	0	0	78	600	0	678	19	0	61	80	1355
% App. Total	0	94.6	5.4		0	0	0		11.5	88.5	0		23.8	0	76.2		
PHF	.000	.935	.727	.927	.000	.000	.000	.000	.886	.980	.000	.980	.594	.000	.847	.833	.965
Passenger Vehicles	0	540	31	571	0	0	0	0	76	571	0	647	18	0	58	76	1294
% Passenger Vehicles	0	95.6	96.9	95.6	0	0	0	0	97.4	95.2	0	95.4	94.7	0	95.1	95.0	95.5
Single Unit	0	25	0	25	0	0	0	0	2	27	0	29	1	0	3	4	58
% Single Unit	0	4.4	0	4.2	0	0	0	0	2.6	4.5	0	4.3	5.3	0	4.9	5.0	4.3
TTST	0	0	1	1	0	0	0	0	0	2	0	2	0	0	0	0	3
% TTST	0	0	3.1	0.2	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

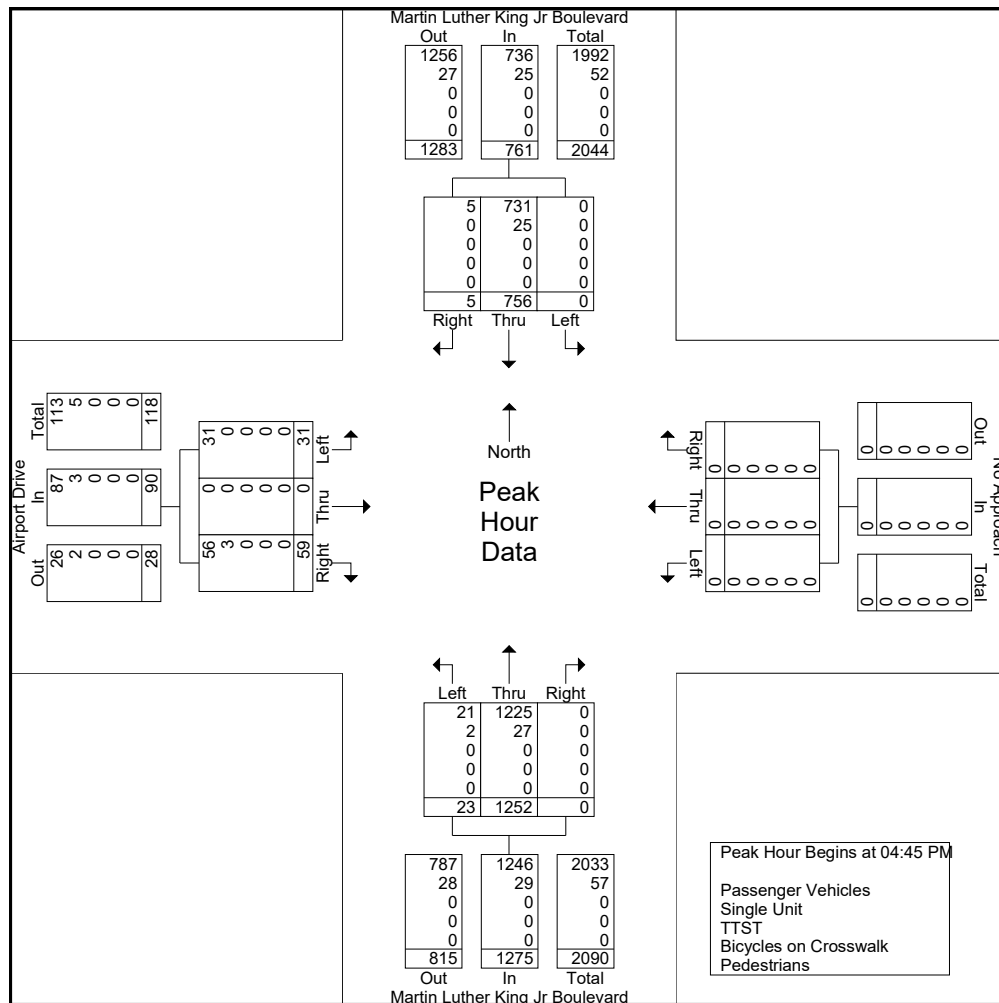
File Name : MLK@Airport

Site Code :

Start Date : 1/28/2020

Page No : 4

	Martin Luther King Jr Boulevard Southbound				No Approach Westbound				Martin Luther King Jr Boulevard Northbound				Airport Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	182	3	185	0	0	0	0	10	283	0	293	7	0	22	29	507
05:00 PM	0	176	2	178	0	0	0	0	4	327	0	331	11	0	21	32	541
05:15 PM	0	196	0	196	0	0	0	0	3	332	0	335	7	0	7	14	545
05:30 PM	0	202	0	202	0	0	0	0	6	310	0	316	6	0	9	15	533
Total Volume	0	756	5	761	0	0	0	0	23	1252	0	1275	31	0	59	90	2126
% App. Total	0	99.3	0.7		0	0	0		1.8	98.2	0		34.4	0	65.6		
PHF	.000	.936	.417	.942	.000	.000	.000	.000	.575	.943	.000	.951	.705	.000	.670	.703	.975
Passenger Vehicles	0	731	5	736	0	0	0	0	21	1225	0	1246	31	0	56	87	2069
% Passenger Vehicles	0	96.7	100	96.7	0	0	0	0	91.3	97.8	0	97.7	100	0	94.9	96.7	97.3
Single Unit	0	25	0	25	0	0	0	0	2	27	0	29	0	0	3	3	57
% Single Unit	0	3.3	0	3.3	0	0	0	0	8.7	2.2	0	2.3	0	0	5.1	3.3	2.7
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Estes
Site Code :
Start Date : 1/28/2020
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Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Martin Luther King Jr Boulevard Southbound				Estes Drive Westbound				Martin Luther King Jr Boulevard Northbound				Estes Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
12:00 AM	1	13	7	0	4	3	3	0	1	15	1	0	2	2	1	0	0	53	53
12:15 AM	2	7	2	0	2	5	4	0	0	16	1	0	0	1	1	0	0	41	41
12:30 AM	2	4	2	0	0	2	2	1	1	41	0	0	8	2	1	0	1	65	66
12:45 AM	0	9	3	0	2	2	1	0	0	12	1	0	2	2	0	0	0	34	34
Total	5	33	14	0	8	12	10	1	2	84	3	0	12	7	3	0	1	193	194
01:00 AM	1	3	0	0	1	1	2	0	0	14	0	0	0	2	1	0	0	25	25
01:15 AM	0	7	1	0	0	1	0	0	0	15	1	0	1	0	0	0	0	26	26
01:30 AM	1	3	2	0	0	0	1	0	0	9	1	0	0	0	0	0	0	17	17
01:45 AM	1	5	1	0	3	0	3	0	2	7	0	0	5	2	0	0	0	29	29
Total	3	18	4	0	4	2	6	0	2	45	2	0	6	4	1	0	0	97	97
02:00 AM	1	4	3	0	0	2	1	1	0	3	1	0	1	2	1	0	1	19	20
02:15 AM	0	6	0	0	1	3	0	0	0	5	0	0	1	1	0	0	0	17	17
02:30 AM	0	3	0	0	0	1	0	0	1	2	0	0	2	0	1	0	0	10	10
02:45 AM	0	1	0	0	1	1	0	0	0	7	1	0	0	1	0	0	0	12	12
Total	1	14	3	0	2	7	1	1	1	17	2	0	4	4	2	0	1	58	59
03:00 AM	1	4	0	0	1	0	1	1	0	4	0	0	1	1	0	0	1	13	14
03:15 AM	0	3	1	0	1	1	0	0	0	8	2	0	1	0	0	0	0	17	17
03:30 AM	1	5	2	0	1	1	2	0	0	4	1	0	2	0	0	0	0	19	19
03:45 AM	2	7	0	0	0	0	0	0	1	7	0	0	0	3	0	0	0	20	20
Total	4	19	3	0	3	2	3	1	1	23	3	0	4	4	0	0	1	69	70
04:00 AM	3	6	0	0	0	1	3	0	0	5	0	0	1	1	0	0	0	20	20
04:15 AM	0	9	3	0	1	1	0	0	0	5	0	0	1	1	1	0	0	22	22
04:30 AM	4	12	2	0	1	0	0	0	1	5	2	0	3	1	0	0	0	31	31
04:45 AM	4	13	0	0	1	1	6	0	0	7	0	0	2	5	0	0	0	39	39
Total	11	40	5	0	3	3	9	0	1	22	2	0	7	8	1	0	0	112	112
05:00 AM	7	10	4	0	2	1	3	0	0	5	2	0	5	4	0	0	0	43	43
05:15 AM	12	23	5	0	6	2	5	0	0	10	2	0	3	6	7	0	0	81	81
05:30 AM	10	42	9	0	10	2	4	0	0	13	2	0	8	6	5	0	0	111	111
05:45 AM	18	53	17	0	5	3	7	1	1	18	7	0	13	11	2	0	1	155	156
Total	47	128	35	0	23	8	19	1	1	46	13	0	29	27	14	0	1	390	391
06:00 AM	8	55	4	0	3	8	11	0	2	22	6	0	9	11	1	0	0	140	140
06:15 AM	14	78	17	0	7	8	7	1	2	41	13	0	15	11	3	0	1	216	217
06:30 AM	23	101	16	0	7	6	13	1	3	40	8	0	14	19	1	0	1	251	252
06:45 AM	21	103	25	0	24	17	12	1	6	44	14	0	36	25	7	0	1	334	335
Total	66	337	62	0	41	39	43	3	13	147	41	0	74	66	12	0	3	941	944
07:00 AM	41	157	42	0	21	17	14	1	5	77	16	0	41	37	5	0	1	473	474
07:15 AM	57	178	34	0	13	29	23	0	3	63	26	0	53	61	5	0	0	545	545
07:30 AM	86	261	71	0	41	44	53	2	10	102	32	0	58	74	14	0	2	846	848
07:45 AM	90	240	62	0	41	39	58	1	7	101	27	0	72	76	20	0	1	833	834
Total	274	836	209	0	116	129	148	4	25	343	101	0	224	248	44	0	4	2697	2701
08:00 AM	97	226	33	0	33	23	51	0	12	103	26	0	68	68	17	0	0	757	757
08:15 AM	77	211	53	0	43	34	60	0	5	108	28	0	64	79	29	0	0	791	791
08:30 AM	62	231	51	0	37	31	33	0	9	120	23	0	58	60	22	0	0	737	737
08:45 AM	69	246	49	0	42	34	38	0	8	77	25	0	58	70	27	0	0	743	743
Total	305	914	186	0	155	122	182	0	34	408	102	0	248	277	95	0	0	3028	3028
09:00 AM	68	252	35	0	28	27	33	0	5	84	30	0	40	51	17	0	0	670	670
09:15 AM	66	147	36	0	20	34	40	0	11	85	25	0	34	55	21	0	0	574	574
09:30 AM	51	148	25	0	27	34	33	1	3	84	44	0	34	49	11	0	1	543	544
09:45 AM	59	151	28	0	26	43	36	2	4	87	33	0	29	37	11	0	2	544	546
Total	244	698	124	0	101	138	142	3	23	340	132	0	137	192	60	0	3	2331	2334

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Estes
Site Code :
Start Date : 1/28/2020
Page No : 2

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Martin Luther King Jr Boulevard Southbound				Estes Drive Westbound				Martin Luther King Jr Boulevard Northbound				Estes Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
10:00 AM	55	114	29	0	29	30	46	2	5	90	32	0	28	41	6	1	3	505	508
10:15 AM	45	114	38	0	22	38	46	0	7	88	33	0	37	40	12	0	0	520	520
10:30 AM	66	143	42	0	22	41	40	1	11	66	25	0	39	47	9	0	1	551	552
10:45 AM	47	107	25	0	24	58	55	1	8	111	29	0	43	31	12	0	1	550	551
Total	213	478	134	0	97	167	187	4	31	355	119	0	147	159	39	1	5	2126	2131
11:00 AM	38	93	45	0	16	36	41	0	4	110	32	0	27	43	6	0	0	491	491
11:15 AM	40	95	25	0	40	36	61	1	7	84	31	0	35	39	6	0	1	499	500
11:30 AM	49	92	46	0	34	35	51	2	8	99	34	0	40	44	8	0	2	540	542
11:45 AM	50	108	29	0	27	40	50	0	4	116	52	0	29	30	11	0	0	546	546
Total	177	388	145	0	117	147	203	3	23	409	149	0	131	156	31	0	3	2076	2079
12:00 PM	43	124	34	0	28	35	59	1	12	109	36	0	47	42	9	0	1	578	579
12:15 PM	50	115	33	0	24	49	50	1	13	124	31	0	21	42	9	0	1	561	562
12:30 PM	45	99	37	0	31	37	45	1	13	117	27	0	39	48	3	0	1	541	542
12:45 PM	57	118	45	0	33	47	61	1	13	107	34	0	41	41	6	0	1	603	604
Total	195	456	149	0	116	168	215	4	51	457	128	0	148	173	27	0	4	2283	2287
01:00 PM	47	106	37	0	37	60	45	3	5	113	25	0	45	48	11	0	3	579	582
01:15 PM	53	113	39	0	31	56	65	0	10	94	23	0	42	33	5	0	0	564	564
01:30 PM	48	97	38	0	43	31	54	2	9	100	42	0	26	44	7	0	2	539	541
01:45 PM	48	118	28	0	37	62	55	3	5	109	25	0	40	36	2	0	3	565	568
Total	196	434	142	0	148	209	219	8	29	416	115	0	153	161	25	0	8	2247	2255
02:00 PM	37	91	33	0	28	37	42	0	8	130	41	0	43	47	10	0	0	547	547
02:15 PM	59	95	33	0	26	57	62	1	9	123	45	0	38	35	10	0	1	592	593
02:30 PM	54	100	45	0	34	46	62	1	12	134	34	0	58	52	6	0	1	637	638
02:45 PM	44	117	40	0	19	47	84	2	4	158	38	0	61	49	9	0	2	670	672
Total	194	403	151	0	107	187	250	4	33	545	158	0	200	183	35	0	4	2446	2450
03:00 PM	55	92	36	0	24	53	58	0	8	148	39	0	47	46	13	0	0	619	619
03:15 PM	48	107	43	0	23	26	44	1	6	164	45	0	47	38	8	0	1	599	600
03:30 PM	37	108	41	0	35	70	106	4	3	211	23	1	50	58	11	0	5	753	758
03:45 PM	46	102	44	0	40	65	66	1	11	182	30	0	50	40	8	0	1	684	685
Total	186	409	164	0	122	214	274	6	28	705	137	1	194	182	40	0	7	2655	2662
04:00 PM	55	111	48	0	28	66	80	2	7	235	42	0	65	58	13	0	2	808	810
04:15 PM	78	122	57	0	33	47	68	0	11	232	51	0	48	43	12	0	0	802	802
04:30 PM	53	136	43	0	24	65	70	0	17	267	45	0	73	77	7	0	0	877	877
04:45 PM	62	160	52	0	38	72	99	7	20	231	53	0	55	45	8	0	7	895	902
Total	248	529	200	0	123	250	317	9	55	965	191	0	241	223	40	0	9	3382	3391
05:00 PM	38	126	43	0	41	67	90	4	24	255	49	0	70	72	17	0	4	892	896
05:15 PM	52	178	59	0	36	73	107	1	9	318	53	0	66	56	11	0	1	1018	1019
05:30 PM	62	178	47	0	41	72	121	2	15	258	50	0	40	54	14	0	2	952	954
05:45 PM	62	148	49	0	47	88	96	2	18	239	54	0	55	57	14	0	2	927	929
Total	214	630	198	0	165	300	414	9	66	1070	206	0	231	239	56	0	9	3789	3798
06:00 PM	71	157	61	0	35	55	85	2	8	165	44	0	45	46	10	2	4	782	786
06:15 PM	47	123	52	0	40	60	75	3	7	136	40	0	53	53	4	1	4	690	694
06:30 PM	41	139	44	0	27	59	72	2	5	181	33	0	32	36	9	0	2	678	680
06:45 PM	46	99	42	0	43	51	76	1	12	121	26	0	43	41	13	0	1	613	614
Total	205	518	199	0	145	225	308	8	32	603	143	0	173	176	36	3	11	2763	2774
07:00 PM	41	93	34	0	23	73	67	1	15	124	23	0	38	20	9	0	1	560	561
07:15 PM	35	83	23	0	30	35	72	3	7	128	16	0	35	25	11	0	3	500	503
07:30 PM	24	82	39	0	29	54	54	1	10	125	28	0	18	36	9	0	1	508	509
07:45 PM	15	76	27	0	27	53	59	2	14	132	24	0	29	14	5	0	2	475	477
Total	115	334	123	0	109	215	252	7	46	509	91	0	120	95	34	0	7	2043	2050

VHB Engineering NC, P.C.

Venture I
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Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Estes
Site Code :
Start Date : 1/28/2020
Page No : 3

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Martin Luther King Jr Boulevard Southbound				Estes Drive Westbound				Martin Luther King Jr Boulevard Northbound				Estes Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
08:00 PM	20	57	19	0	28	66	43	1	15	104	30	0	19	21	8	0	1	430	431
08:15 PM	22	70	27	0	17	45	45	0	7	83	23	0	23	18	5	0	0	385	385
08:30 PM	21	46	11	0	24	25	30	0	9	103	20	0	22	10	1	0	0	322	322
08:45 PM	22	72	25	0	17	26	34	0	6	102	12	0	19	13	1	0	0	349	349
Total	85	245	82	0	86	162	152	1	37	392	85	0	83	62	15	0	1	1486	1487
09:00 PM	11	55	31	0	16	34	31	0	6	88	15	0	11	14	3	0	0	315	315
09:15 PM	8	42	25	0	12	32	29	0	5	75	13	0	12	16	3	0	0	272	272
09:30 PM	4	42	22	0	4	22	22	0	4	65	5	0	21	10	6	0	0	227	227
09:45 PM	8	29	15	0	12	19	15	0	3	51	11	0	22	8	3	0	0	196	196
Total	31	168	93	0	44	107	97	0	18	279	44	0	66	48	15	0	0	1010	1010
10:00 PM	6	29	11	0	13	13	12	0	2	61	6	0	7	6	1	0	0	167	167
10:15 PM	6	26	8	0	8	8	13	1	0	41	8	0	9	4	1	0	1	132	133
10:30 PM	11	45	9	0	11	27	23	0	2	44	5	0	12	6	1	0	0	196	196
10:45 PM	5	43	10	0	3	6	9	0	1	26	5	0	6	7	2	0	0	123	123
Total	28	143	38	0	35	54	57	1	5	172	24	0	34	23	5	0	1	618	619
11:00 PM	3	15	11	0	8	10	9	0	1	30	1	0	5	2	3	0	0	98	98
11:15 PM	2	16	8	0	4	9	9	0	0	31	3	0	6	4	0	0	0	92	92
11:30 PM	2	23	5	0	2	11	3	0	1	24	2	0	8	2	2	0	0	85	85
11:45 PM	3	14	2	0	4	8	2	0	1	34	1	0	8	1	2	0	0	80	80
Total	10	68	26	0	18	38	23	0	3	119	7	0	27	9	7	0	0	355	355
Grand Total	3057	8240	2489	0	1888	2905	3531	78	560	8471	1998	1	2693	2726	637	4	83	39195	39278
Apprch %	22.2	59.8	18.1		22.7	34.9	42.4		5.1	76.8	18.1		44.5	45	10.5				
Total %	7.8	21	6.4		4.8	7.4	9		1.4	21.6	5.1		6.9	7	1.6		0.2	99.8	
Passenger Vehicles	2988	7874	2413		1835	2859	3448		536	8100	1941		2632	2674	616		0	0	37916
% Passenger Vehicles	97.7	95.6	96.9	0	97.2	98.4	97.6	0	95.7	95.6	97.1	0	97.7	98.1	96.7	0	0	0	96.5
Single Unit	65	356	72		52	44	78		23	357	55		57	52	20		0	0	1231
% Single Unit	2.1	4.3	2.9	0	2.8	1.5	2.2	0	4.1	4.2	2.8	0	2.1	1.9	3.1	0	0	0	3.1
TTST	4	10	4		1	2	5		1	14	2		4	0	1		0	0	48
% TTST	0.1	0.1	0.2	0	0.1	0.1	0.1	0	0.2	0.2	0.1	0	0.1	0	0.2	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	17
% Bicycles on Crosswalk	0	0	0	0	0	0	0	17.9	0	0	0	0	0	0	0	75	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	66
% Pedestrians	0	0	0	0	0	0	0	82.1	0	0	0	100	0	0	0	25	0	0	0.2

VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

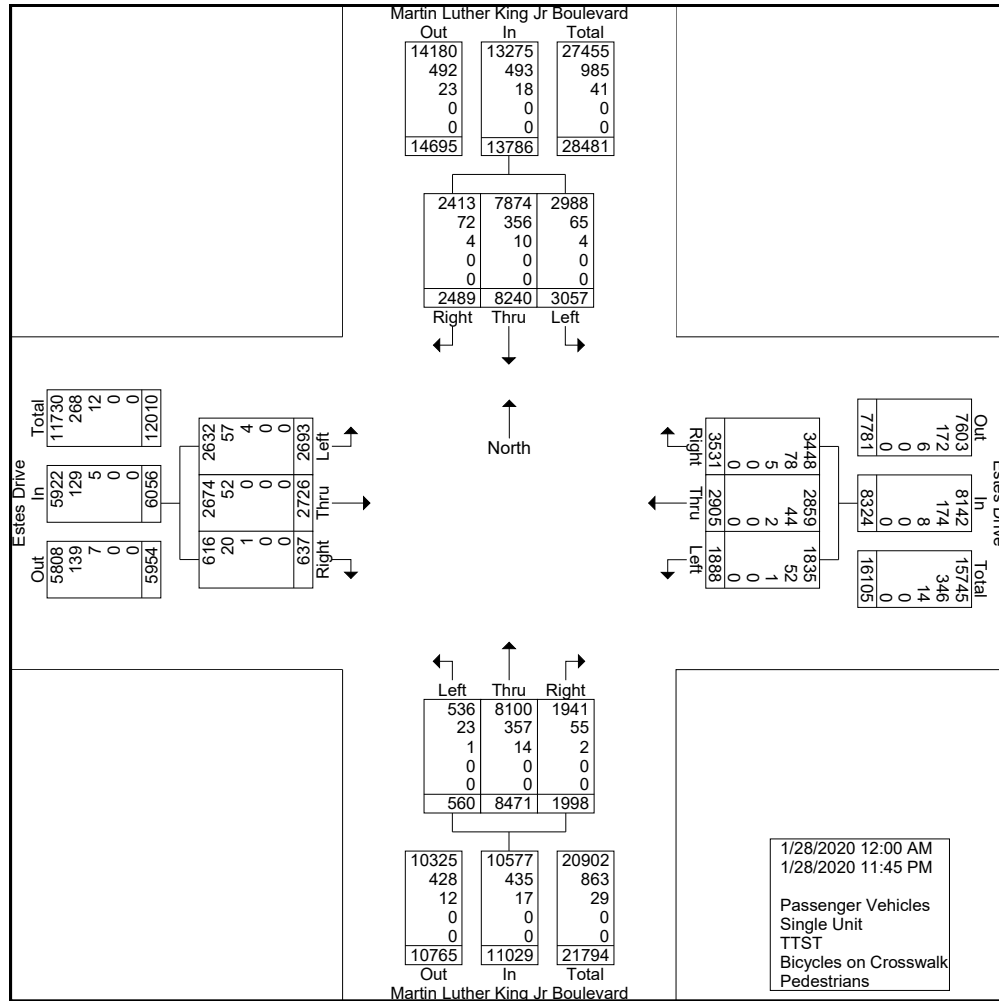
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Estes

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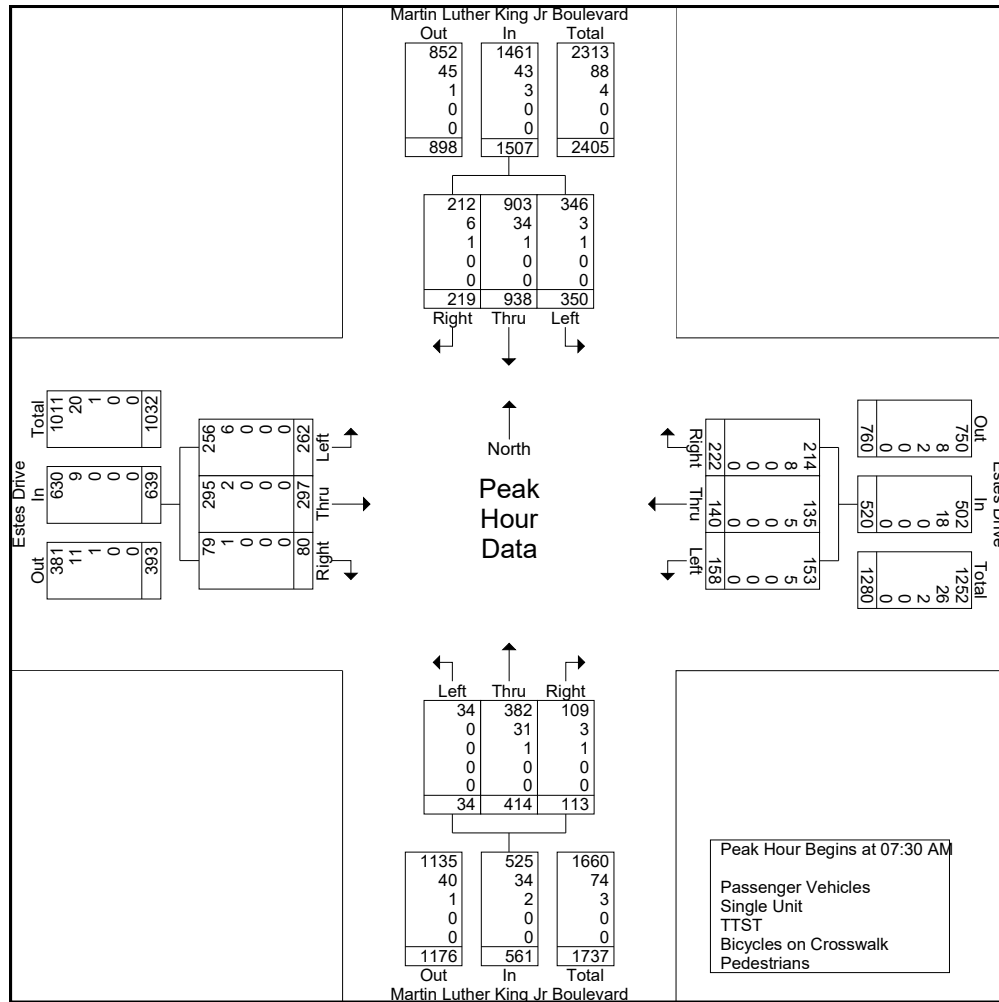


VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
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p: 919.829.0328 f: 919.833.0034

File Name : MLK@Estes
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	Martin Luther King Jr Boulevard Southbound				Estes Drive Westbound				Martin Luther King Jr Boulevard Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	86	261	71	418	41	44	53	138	10	102	32	144	58	74	14	146	846
07:45 AM	90	240	62	392	41	39	58	138	7	101	27	135	72	76	20	168	833
08:00 AM	97	226	33	356	33	23	51	107	12	103	26	141	68	68	17	153	757
08:15 AM	77	211	53	341	43	34	60	137	5	108	28	141	64	79	29	172	791
Total Volume	350	938	219	1507	158	140	222	520	34	414	113	561	262	297	80	639	3227
% App. Total	23.2	62.2	14.5		30.4	26.9	42.7		6.1	73.8	20.1		41	46.5	12.5		
PHF	.902	.898	.771	.901	.919	.795	.925	.942	.708	.958	.883	.974	.910	.940	.690	.929	.954
Passenger Vehicles	346	903	212	1461	153	135	214	502	34	382	109	525	256	295	79	630	3118
% Passenger Vehicles	98.9	96.3	96.8	96.9	96.8	96.4	96.4	96.5	100	92.3	96.5	93.6	97.7	99.3	98.8	98.6	96.6
Single Unit	3	34	6	43	5	5	8	18	0	31	3	34	6	2	1	9	104
% Single Unit	0.9	3.6	2.7	2.9	3.2	3.6	3.6	3.5	0	7.5	2.7	6.1	2.3	0.7	1.3	1.4	3.2
TTST	1	1	1	3	0	0	0	0	0	1	1	2	0	0	0	0	5
% TTST	0.3	0.1	0.5	0.2	0	0	0	0	0	0.2	0.9	0.4	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

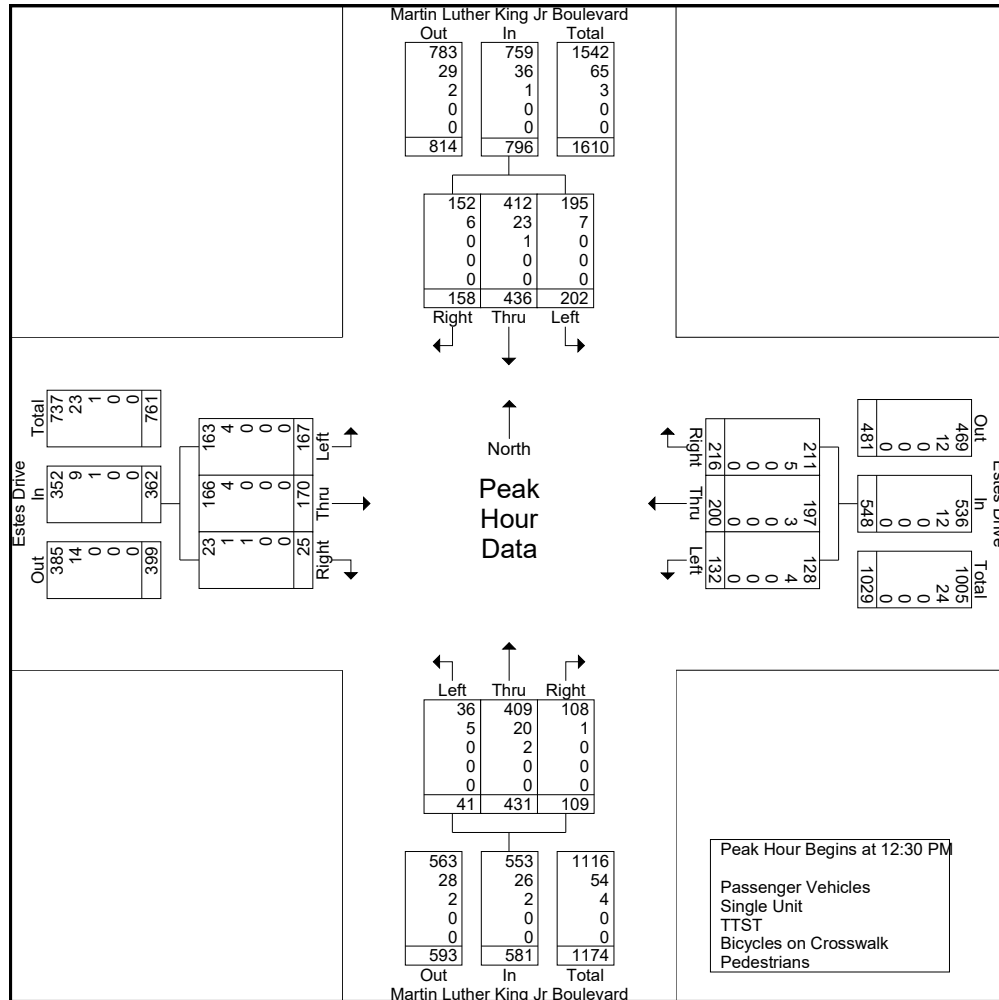


VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
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File Name : MLK@Estes
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	Martin Luther King Jr Boulevard Southbound				Estes Drive Westbound				Martin Luther King Jr Boulevard Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30 PM																	
12:30 PM	45	99	37	181	31	37	45	113	13	117	27	157	39	48	3	90	541
12:45 PM	57	118	45	220	33	47	61	141	13	107	34	154	41	41	6	88	603
01:00 PM	47	106	37	190	37	60	45	142	5	113	25	143	45	48	11	104	579
01:15 PM	53	113	39	205	31	56	65	152	10	94	23	127	42	33	5	80	564
Total Volume	202	436	158	796	132	200	216	548	41	431	109	581	167	170	25	362	2287
% App. Total	25.4	54.8	19.8		24.1	36.5	39.4		7.1	74.2	18.8		46.1	47	6.9		
PHF	.886	.924	.878	.905	.892	.833	.831	.901	.788	.921	.801	.925	.928	.885	.568	.870	.948
Passenger Vehicles	195	412	152	759	128	197	211	536	36	409	108	553	163	166	23	352	2200
% Passenger Vehicles	96.5	94.5	96.2	95.4	97.0	98.5	97.7	97.8	87.8	94.9	99.1	95.2	97.6	97.6	92.0	97.2	96.2
Single Unit	7	23	6	36	4	3	5	12	5	20	1	26	4	4	1	9	83
% Single Unit	3.5	5.3	3.8	4.5	3.0	1.5	2.3	2.2	12.2	4.6	0.9	4.5	2.4	2.4	4.0	2.5	3.6
TTST	0	1	0	1	0	0	0	0	0	2	0	2	0	0	1	1	4
% TTST	0	0.2	0	0.1	0	0	0	0	0	0.5	0	0.3	0	0	4.0	0.3	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

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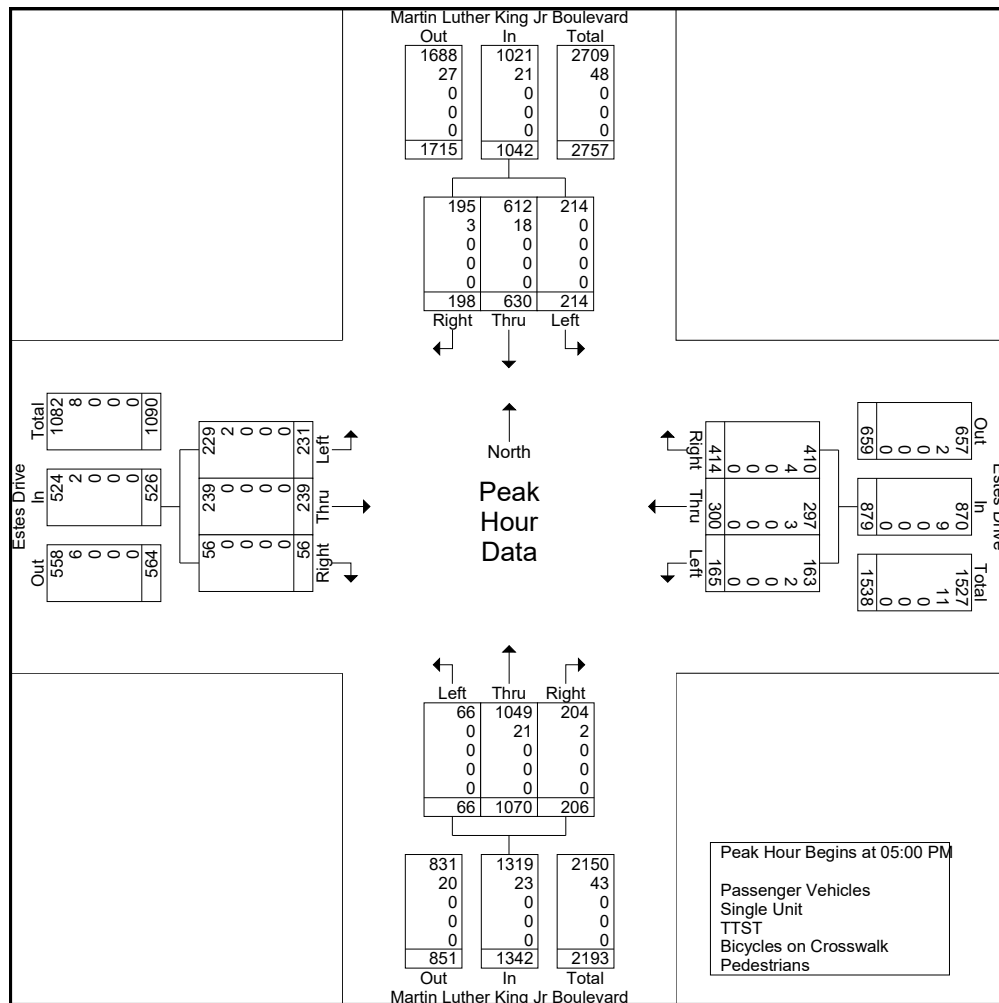
File Name : MLK@Estes

Site Code :

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	Martin Luther King Jr Boulevard Southbound				Estes Drive Westbound				Martin Luther King Jr Boulevard Northbound				Estes Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	38	126	43	207	41	67	90	198	24	255	49	328	70	72	17	159	892
05:15 PM	52	178	59	289	36	73	107	216	9	318	53	380	66	56	11	133	1018
05:30 PM	62	178	47	287	41	72	121	234	15	258	50	323	40	54	14	108	952
05:45 PM	62	148	49	259	47	88	96	231	18	239	54	311	55	57	14	126	927
Total Volume	214	630	198	1042	165	300	414	879	66	1070	206	1342	231	239	56	526	3789
% App. Total	20.5	60.5	19		18.8	34.1	47.1		4.9	79.7	15.4		43.9	45.4	10.6		
PHF	.863	.885	.839	.901	.878	.852	.855	.939	.688	.841	.954	.883	.825	.830	.824	.827	.931
Passenger Vehicles	214	612	195	1021	163	297	410	870	66	1049	204	1319	229	239	56	524	3734
% Passenger Vehicles	100	97.1	98.5	98.0	98.8	99.0	99.0	99.0	100	98.0	99.0	98.3	99.1	100	100	99.6	98.5
Single Unit	0	18	3	21	2	3	4	9	0	21	2	23	2	0	0	2	55
% Single Unit	0	2.9	1.5	2.0	1.2	1.0	1.0	1.0	0	2.0	1.0	1.7	0.9	0	0	0.4	1.5
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Homestead
Site Code :
Start Date : 1/28/2020
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

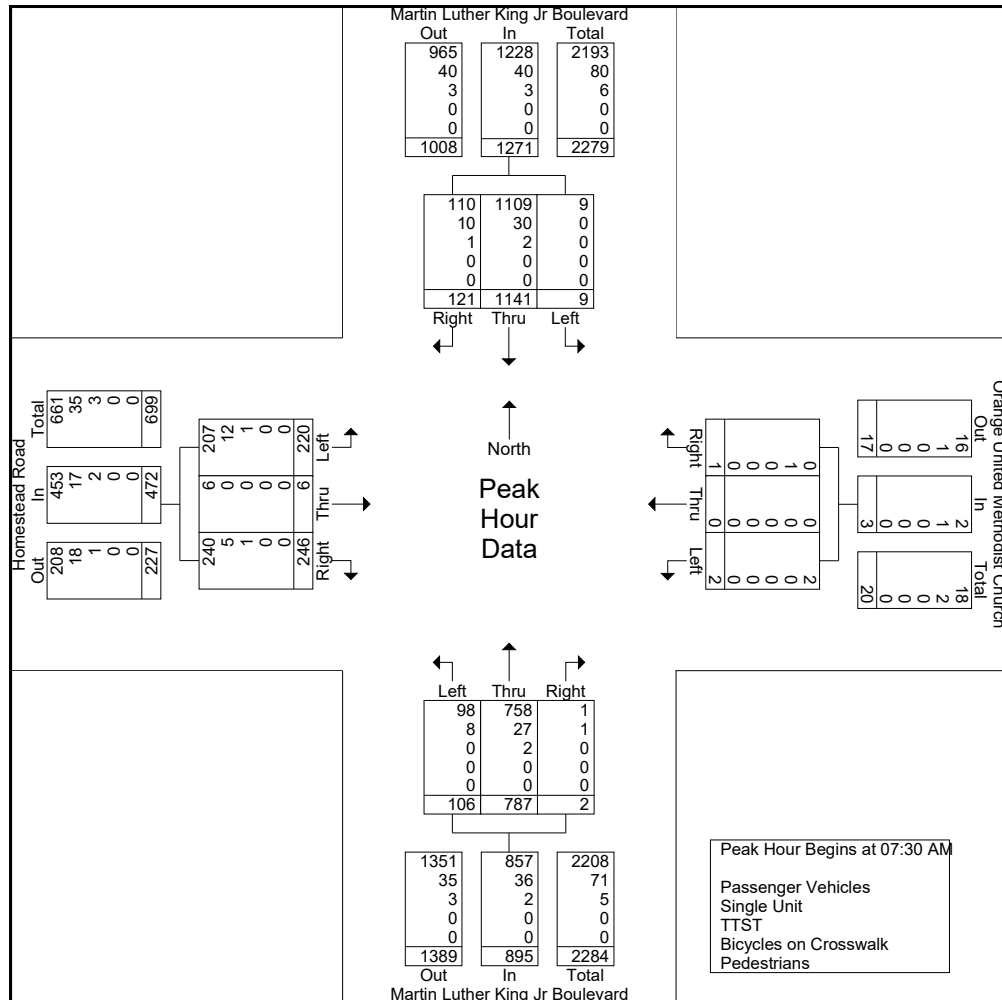
	Martin Luther King Jr Boulevard Southbound				Orange United Methodist Church Westbound				Martin Luther King Jr Boulevard Northbound				Homestead Road Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	197	13	0	0	0	0	0	23	98	1	0	21	0	47	0	0	400	400
07:15 AM	1	229	40	0	1	0	0	0	18	156	0	1	29	0	49	1	2	523	525
07:30 AM	0	302	29	1	0	0	1	0	18	175	1	0	58	0	57	1	2	641	643
07:45 AM	1	276	34	0	0	0	0	1	26	200	1	3	58	1	69	3	7	666	673
Total	2	1004	116	1	1	0	1	1	85	629	3	4	166	1	222	5	11	2230	2241
08:00 AM	4	269	24	0	0	0	0	0	31	216	0	1	56	2	60	0	1	662	663
08:15 AM	4	294	34	0	2	0	0	0	31	196	0	0	48	3	60	1	1	672	673
08:30 AM	7	273	24	0	2	0	4	0	22	187	1	0	45	0	51	0	0	616	616
08:45 AM	6	296	36	0	1	0	4	0	22	157	1	0	32	6	60	0	0	621	621
Total	21	1132	118	0	5	0	8	0	106	756	2	1	181	11	231	1	2	2571	2573
*** BREAK ***																			
11:00 AM	1	124	22	0	0	0	0	0	24	121	0	0	21	0	30	0	0	343	343
11:15 AM	1	124	25	0	0	0	0	0	31	135	0	0	28	0	34	0	0	378	378
11:30 AM	2	117	19	0	0	0	0	1	34	136	0	1	42	1	40	1	3	391	394
11:45 AM	9	132	24	2	0	0	0	1	32	141	0	0	28	4	33	0	3	403	406
Total	13	497	90	2	0	0	0	2	121	533	0	1	119	5	137	1	6	1515	1521
12:00 PM	8	131	15	2	6	6	4	2	44	169	0	2	30	1	52	0	6	466	472
12:15 PM	2	150	22	0	3	1	7	2	36	149	1	0	37	0	43	1	3	451	454
12:30 PM	4	126	24	0	0	0	1	6	36	167	1	7	22	0	44	0	13	425	438
12:45 PM	5	163	32	0	2	0	2	0	37	149	0	0	18	1	47	0	0	456	456
Total	19	570	93	2	11	7	14	10	153	634	2	9	107	2	186	1	22	1798	1820
*** BREAK ***																			
04:00 PM	0	184	46	0	0	0	0	0	40	303	0	0	34	1	53	0	0	661	661
04:15 PM	2	217	41	1	0	1	2	4	45	278	0	5	51	0	50	0	10	687	697
04:30 PM	0	187	50	2	1	0	3	3	43	346	0	2	33	1	51	1	8	715	723
04:45 PM	0	191	45	0	1	0	0	1	53	321	0	0	42	0	38	1	2	691	693
Total	2	779	182	3	2	1	5	8	181	1248	0	7	160	2	192	2	20	2754	2774
05:00 PM	2	185	55	1	2	0	0	14	65	317	0	9	72	0	38	0	24	736	760
05:15 PM	1	240	43	0	0	2	0	0	64	367	0	0	37	0	49	1	1	803	804
05:30 PM	1	183	36	0	0	0	0	5	61	334	0	6	41	0	44	1	12	700	712
05:45 PM	3	199	57	1	0	0	1	6	60	308	0	6	53	0	46	0	13	727	740
Total	7	807	191	2	2	2	1	25	250	1326	0	21	203	0	177	2	50	2966	3016
Grand Total	64	4789	790	10	21	10	29	46	896	5126	7	43	936	21	1145	12	111	13834	13945
Apprch %	1.1	84.9	14		35	16.7	48.3		14.9	85	0.1		44.5	1	54.5				
Total %	0.5	34.6	5.7		0.2	0.1	0.2		6.5	37.1	0.1		6.8	0.2	8.3		0.8	99.2	
Passenger Vehicles	63	4616	730		20	10	28		855	4966	4		895	21	1106		0	0	13314
% Passenger Vehicles	98.4	96.4	92.4	0	95.2	100	96.6	0	95.4	96.9	57.1	0	95.6	100	96.6	0	0	0	95.5
Single Unit	1	165	56		1	0	1		41	146	3		39	0	38		0	0	491
% Single Unit	1.6	3.4	7.1	0	4.8	0	3.4	0	4.6	2.8	42.9	0	4.2	0	3.3	0	0	0	3.5
TTST	0	8	4		0	0	0		0	14	0		2	0	1		0	0	29
% TTST	0	0.2	0.5	0	0	0	0	0	0	0.3	0	0	0.2	0	0.1	0	0	0	0.2
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	111
% Pedestrians	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0.8

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Homestead
Site Code :
Start Date : 1/28/2020
Page No : 2

	Martin Luther King Jr Boulevard Southbound				Orange United Methodist Church Westbound				Martin Luther King Jr Boulevard Northbound				Homestead Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	302	29	331	0	0	1	1	18	175	1	194	58	0	57	115	641
07:45 AM	1	276	34	311	0	0	0	0	26	200	1	227	58	1	69	128	666
08:00 AM	4	269	24	297	0	0	0	0	31	216	0	247	56	2	60	118	662
08:15 AM	4	294	34	332	2	0	0	2	31	196	0	227	48	3	60	111	672
Total Volume	9	1141	121	1271	2	0	1	3	106	787	2	895	220	6	246	472	2641
% App. Total	0.7	89.8	9.5		66.7	0	33.3		11.8	87.9	0.2		46.6	1.3	52.1		
PHF	.563	.945	.890	.957	.250	.000	.250	.375	.855	.911	.500	.906	.948	.500	.891	.922	.983
Passenger Vehicles	9	1109	110	1228	2	0	0	2	98	758	1	857	207	6	240	453	2540
% Passenger Vehicles	100	97.2	90.9	96.6	100	0	0	66.7	92.5	96.3	50.0	95.8	94.1	100	97.6	96.0	96.2
Single Unit	0	30	10	40	0	0	1	1	8	27	1	36	12	0	5	17	94
% Single Unit	0	2.6	8.3	3.1	0	0	100	33.3	7.5	3.4	50.0	4.0	5.5	0	2.0	3.6	3.6
TTST	0	2	1	3	0	0	0	0	0	2	0	2	1	0	1	2	7
% TTST	0	0.2	0.8	0.2	0	0	0	0	0	0.3	0	0.2	0.5	0	0.4	0.4	0.3
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

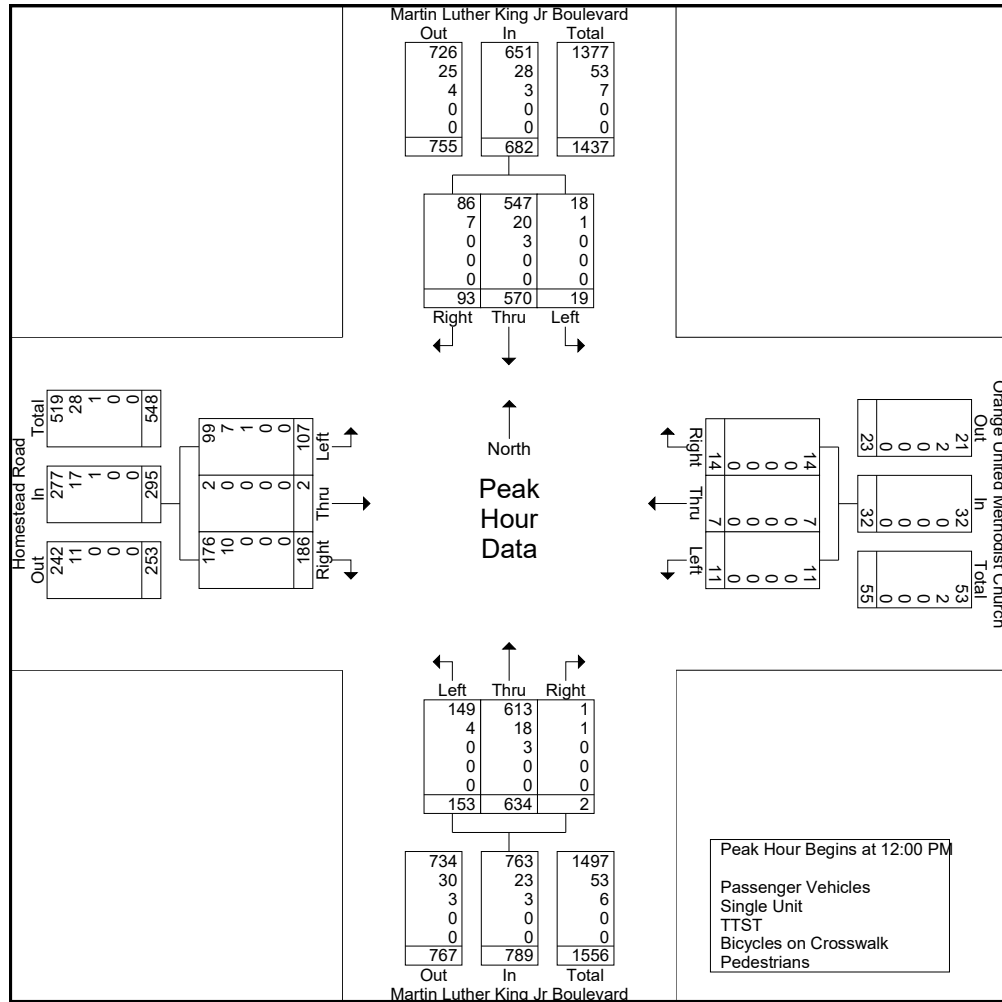


VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@Homestead
Site Code :
Start Date : 1/28/2020
Page No : 3

	Martin Luther King Jr Boulevard Southbound				Orange United Methodist Church Westbound				Martin Luther King Jr Boulevard Northbound				Homestead Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	8	131	15	154	6	6	4	16	44	169	0	213	30	1	52	83	466
12:15 PM	2	150	22	174	3	1	7	11	36	149	1	186	37	0	43	80	451
12:30 PM	4	126	24	154	0	0	1	1	36	167	1	204	22	0	44	66	425
12:45 PM	5	163	32	200	2	0	2	4	37	149	0	186	18	1	47	66	456
Total Volume	19	570	93	682	11	7	14	32	153	634	2	789	107	2	186	295	1798
% App. Total	2.8	83.6	13.6		34.4	21.9	43.8		19.4	80.4	0.3		36.3	0.7	63.1		
PHF	.594	.874	.727	.853	.458	.292	.500	.500	.869	.938	.500	.926	.723	.500	.894	.889	.965
Passenger Vehicles	18	547	86	651	11	7	14	32	149	613	1	763	99	2	176	277	1723
% Passenger Vehicles	94.7	96.0	92.5	95.5	100	100	100	100	97.4	96.7	50.0	96.7	92.5	100	94.6	93.9	95.8
Single Unit	1	20	7	28	0	0	0	0	4	18	1	23	7	0	10	17	68
% Single Unit	5.3	3.5	7.5	4.1	0	0	0	0	2.6	2.8	50.0	2.9	6.5	0	5.4	5.8	3.8
TTST	0	3	0	3	0	0	0	0	0	3	0	3	1	0	0	1	7
% TTST	0	0.5	0	0.4	0	0	0	0	0	0.5	0	0.4	0.9	0	0	0.3	0.4
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

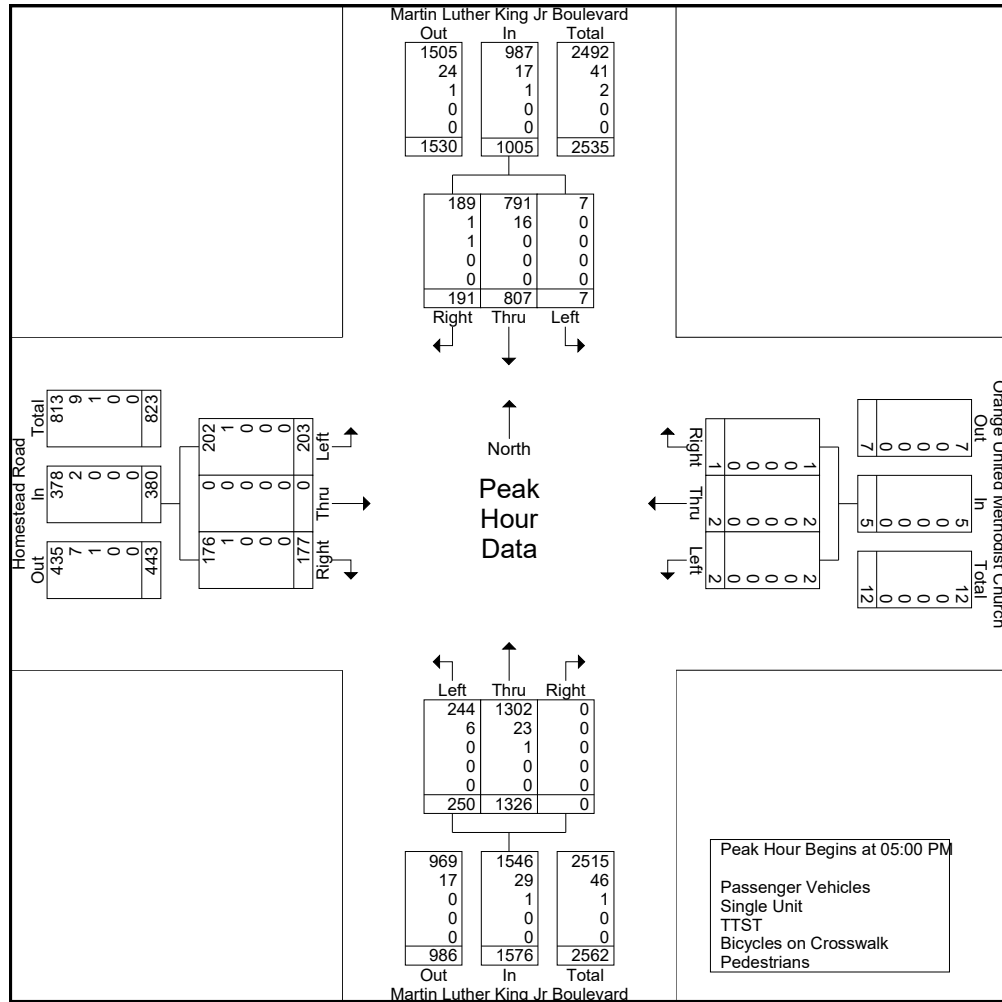
File Name : MLK@Homestead

Site Code :

Start Date : 1/28/2020

Page No : 4

	Martin Luther King Jr Boulevard Southbound				Orange United Methodist Church Westbound				Martin Luther King Jr Boulevard Northbound				Homestead Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	185	55	242	2	0	0	2	65	317	0	382	72	0	38	110	736
05:15 PM	1	240	43	284	0	2	0	2	64	367	0	431	37	0	49	86	803
05:30 PM	1	183	36	220	0	0	0	0	61	334	0	395	41	0	44	85	700
05:45 PM	3	199	57	259	0	0	1	1	60	308	0	368	53	0	46	99	727
Total Volume	7	807	191	1005	2	2	1	5	250	1326	0	1576	203	0	177	380	2966
% App. Total	0.7	80.3	19		40	40	20		15.9	84.1	0		53.4	0	46.6		
PHF	.583	.841	.838	.885	.250	.250	.250	.625	.962	.903	.000	.914	.705	.000	.903	.864	.923
Passenger Vehicles	7	791	189	987	2	2	1	5	244	1302	0	1546	202	0	176	378	2916
% Passenger Vehicles	100	98.0	99.0	98.2	100	100	100	100	97.6	98.2	0	98.1	99.5	0	99.4	99.5	98.3
Single Unit	0	16	1	17	0	0	0	0	6	23	0	29	1	0	1	2	48
% Single Unit	0	2.0	0.5	1.7	0	0	0	0	2.4	1.7	0	1.8	0.5	0	0.6	0.5	1.6
TTST	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% TTST	0	0	0.5	0.1	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@PineyMountain
Site Code :
Start Date : 1/28/2020
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

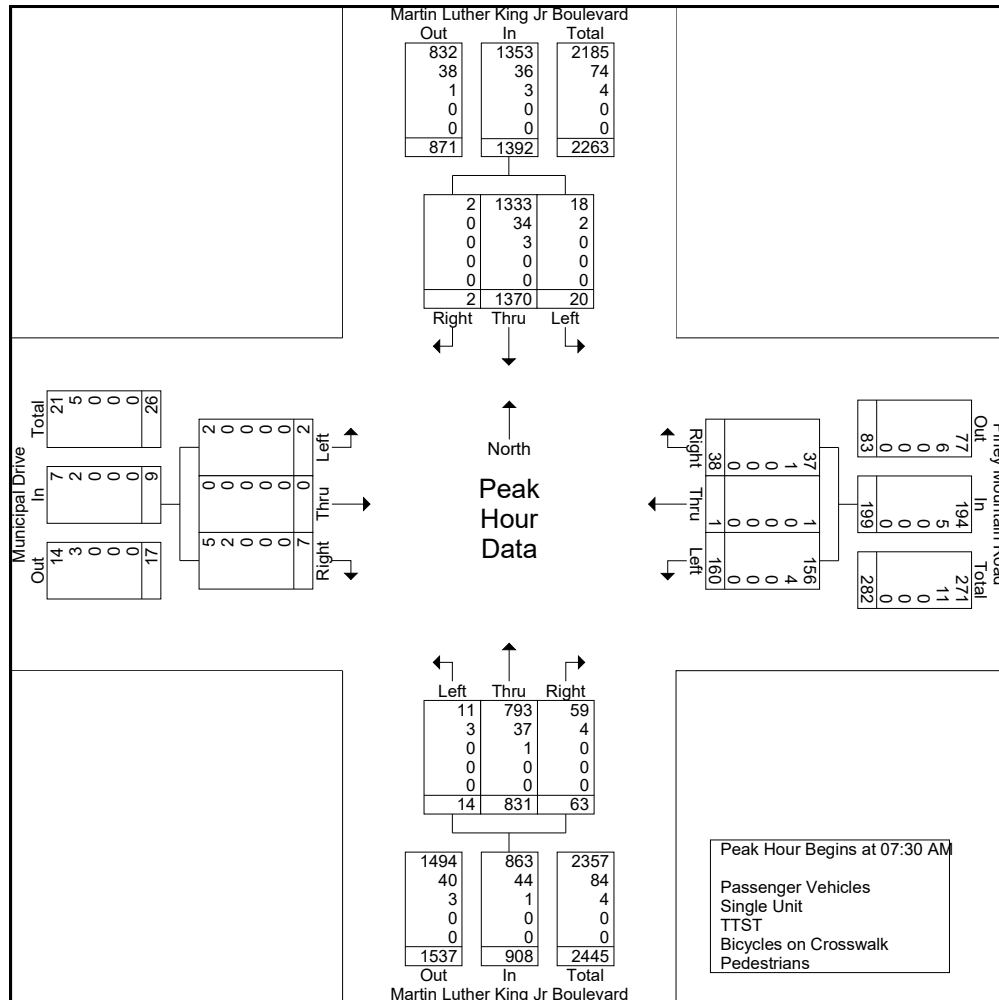
	Martin Luther King Jr Boulevard Southbound				Piney Mountain Road Westbound				Martin Luther King Jr Boulevard Northbound				Municipal Drive Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	6	216	0	0	17	0	12	0	4	118	5	0	0	0	3	0	0	381	381
07:15 AM	3	260	1	0	31	0	12	1	3	129	8	0	0	0	0	0	1	447	448
07:30 AM	4	383	0	0	51	0	6	0	3	180	12	0	0	0	0	0	0	639	639
07:45 AM	5	326	1	0	44	1	9	1	5	217	19	0	0	0	2	0	1	629	630
Total	18	1185	2	0	143	1	39	2	15	644	44	0	0	0	5	0	2	2096	2098
08:00 AM	4	337	1	0	39	0	16	0	3	212	12	0	2	0	1	0	0	627	627
08:15 AM	7	324	0	0	26	0	7	0	3	222	20	1	0	0	4	0	1	613	614
08:30 AM	12	337	1	0	34	0	12	0	3	192	19	0	0	0	1	0	0	611	611
08:45 AM	4	356	2	0	27	0	6	0	3	162	12	0	0	0	4	0	0	576	576
Total	27	1354	4	0	126	0	41	0	12	788	63	1	2	0	10	0	1	2427	2428
*** BREAK ***																			
11:00 AM	2	152	1	0	7	0	3	0	6	157	8	0	0	1	8	0	0	345	345
11:15 AM	4	143	2	1	8	1	4	0	4	159	13	0	1	0	7	0	1	346	347
11:30 AM	8	154	1	1	22	0	5	1	3	150	20	0	0	0	3	0	2	366	368
11:45 AM	4	167	1	0	11	0	4	0	7	170	14	0	0	0	6	0	0	384	384
Total	18	616	5	2	48	1	16	1	20	636	55	0	1	1	24	0	3	1441	1444
12:00 PM	8	189	1	1	14	0	6	1	2	213	16	0	0	0	4	0	2	453	455
12:15 PM	6	171	1	0	17	1	6	0	7	174	8	1	0	0	2	0	1	393	394
12:30 PM	6	164	0	1	18	0	3	0	4	201	12	0	0	0	4	0	1	412	413
12:45 PM	5	208	0	0	14	0	8	0	8	179	17	0	3	0	4	0	0	446	446
Total	25	732	2	2	63	1	23	1	21	767	53	1	3	0	14	0	4	1704	1708
*** BREAK ***																			
04:00 PM	9	205	2	0	15	1	5	0	2	332	16	0	1	0	3	0	0	591	591
04:15 PM	12	235	2	0	20	0	6	1	11	324	14	0	1	0	7	0	1	632	633
04:30 PM	4	218	2	0	25	2	11	0	2	378	24	0	1	0	6	0	0	673	673
04:45 PM	9	235	3	0	25	1	7	0	2	354	24	0	4	0	0	0	0	664	664
Total	34	893	9	0	85	4	29	1	17	1388	78	0	7	0	16	0	1	2560	2561
05:00 PM	10	205	4	0	14	1	7	3	2	379	30	0	8	1	4	0	3	665	668
05:15 PM	5	261	8	0	25	0	9	2	3	407	33	0	1	1	6	0	2	759	761
05:30 PM	9	232	6	0	26	0	6	0	8	403	41	0	15	2	10	0	0	758	758
05:45 PM	18	243	0	0	37	0	9	1	1	343	34	0	0	3	6	0	1	694	695
Total	42	941	18	0	102	1	31	6	14	1532	138	0	24	7	26	0	6	2876	2882
Grand Total	164	5721	40	4	567	8	179	11	99	5755	431	2	37	8	95	0	17	13104	13121
Apprch %	2.8	96.6	0.7		75.2	1.1	23.7		1.6	91.6	6.9		26.4	5.7	67.9				
Total %	1.3	43.7	0.3		4.3	0.1	1.4		0.8	43.9	3.3		0.3	0.1	0.7		0.1	99.9	
Passenger Vehicles	161	5512	39		555	8	168		84	5574	416		35	8	84		0	0	12644
% Passenger Vehicles	98.2	96.3	97.5	0	97.9	100	93.9	0	84.8	96.9	96.5	0	94.6	100	88.4	0	0	0	96.4
Single Unit	3	202	1		12	0	11		13	172	14		2	0	11		0	0	441
% Single Unit	1.8	3.5	2.5	0	2.1	0	6.1	0	13.1	3	3.2	0	5.4	0	11.6	0	0	0	3.4
TTST	0	7	0		0	0	0		2	9	1		0	0	0		0	0	19
% TTST	0	0.1	0	0	0	0	0	0	2	0.2	0.2	0	0	0	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	3
% Bicycles on Crosswalk	0	0	0	0	0	0	0	27.3	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	14
% Pedestrians	0	0	0	100	0	0	0	72.7	0	0	0	100	0	0	0	0	0	0	0.1

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : MLK@PineyMountain
Site Code :
Start Date : 1/28/2020
Page No : 2

	Martin Luther King Jr Boulevard Southbound				Piney Mountain Road Westbound				Martin Luther King Jr Boulevard Northbound				Municipal Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	4	383	0	387	51	0	6	57	3	180	12	195	0	0	0	0	639
07:45 AM	5	326	1	332	44	1	9	54	5	217	19	241	0	0	2	2	629
08:00 AM	4	337	1	342	39	0	16	55	3	212	12	227	2	0	1	3	627
08:15 AM	7	324	0	331	26	0	7	33	3	222	20	245	0	0	4	4	613
Total Volume	20	1370	2	1392	160	1	38	199	14	831	63	908	2	0	7	9	2508
% App. Total	1.4	98.4	0.1		80.4	0.5	19.1		1.5	91.5	6.9		22.2	0	77.8		
PHF	.714	.894	.500	.899	.784	.250	.594	.873	.700	.936	.788	.927	.250	.000	.438	.563	.981
Passenger Vehicles	18	1333	2	1353	156	1	37	194	11	793	59	863	2	0	5	7	2417
% Passenger Vehicles	90.0	97.3	100	97.2	97.5	100	97.4	97.5	78.6	95.4	93.7	95.0	100	0	71.4	77.8	96.4
Single Unit	2	34	0	36	4	0	1	5	3	37	4	44	0	0	2	2	87
% Single Unit	10.0	2.5	0	2.6	2.5	0	2.6	2.5	21.4	4.5	6.3	4.8	0	0	28.6	22.2	3.5
TTST	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
% TTST	0	0.2	0	0.2	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

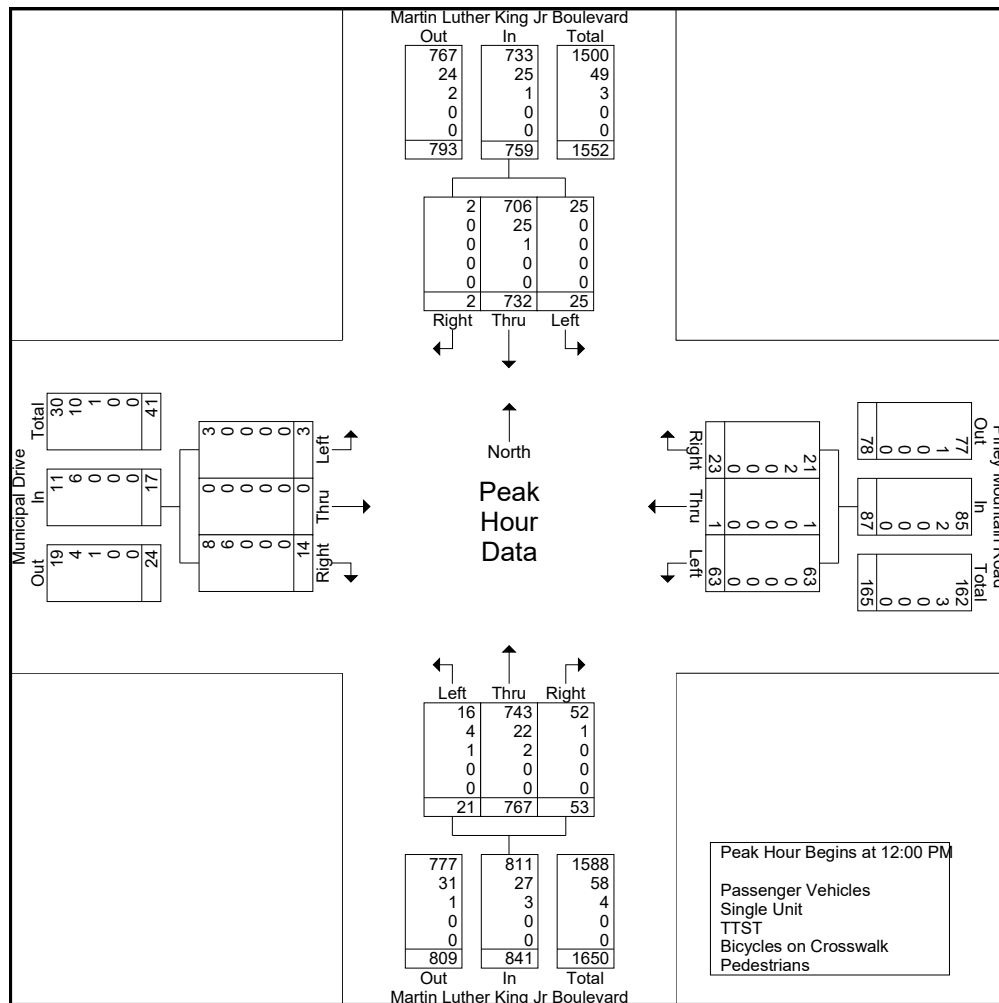
File Name : MLK@PineyMountain

Site Code :

Start Date : 1/28/2020

Page No : 3

	Martin Luther King Jr Boulevard Southbound				Piney Mountain Road Westbound				Martin Luther King Jr Boulevard Northbound				Municipal Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	8	189	1	198	14	0	6	20	2	213	16	231	0	0	4	4	453
12:15 PM	6	171	1	178	17	1	6	24	7	174	8	189	0	0	2	2	393
12:30 PM	6	164	0	170	18	0	3	21	4	201	12	217	0	0	4	4	412
12:45 PM	5	208	0	213	14	0	8	22	8	179	17	204	3	0	4	7	446
Total Volume	25	732	2	759	63	1	23	87	21	767	53	841	3	0	14	17	1704
% App. Total	3.3	96.4	0.3		72.4	1.1	26.4		2.5	91.2	6.3		17.6	0	82.4		
PHF	.781	.880	.500	.891	.875	.250	.719	.906	.656	.900	.779	.910	.250	.000	.875	.607	.940
Passenger Vehicles	25	706	2	733	63	1	21	85	16	743	52	811	3	0	8	11	1640
% Passenger Vehicles	100	96.4	100	96.6	100	100	91.3	97.7	76.2	96.9	98.1	96.4	100	0	57.1	64.7	96.2
Single Unit	0	25	0	25	0	0	2	2	4	22	1	27	0	0	6	6	60
% Single Unit	0	3.4	0	3.3	0	0	8.7	2.3	19.0	2.9	1.9	3.2	0	0	42.9	35.3	3.5
TTST	0	1	0	1	0	0	0	0	1	2	0	3	0	0	0	0	4
% TTST	0	0.1	0	0.1	0	0	0	0	4.8	0.3	0	0.4	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

p: 919.829.0328 f: 919.833.0034

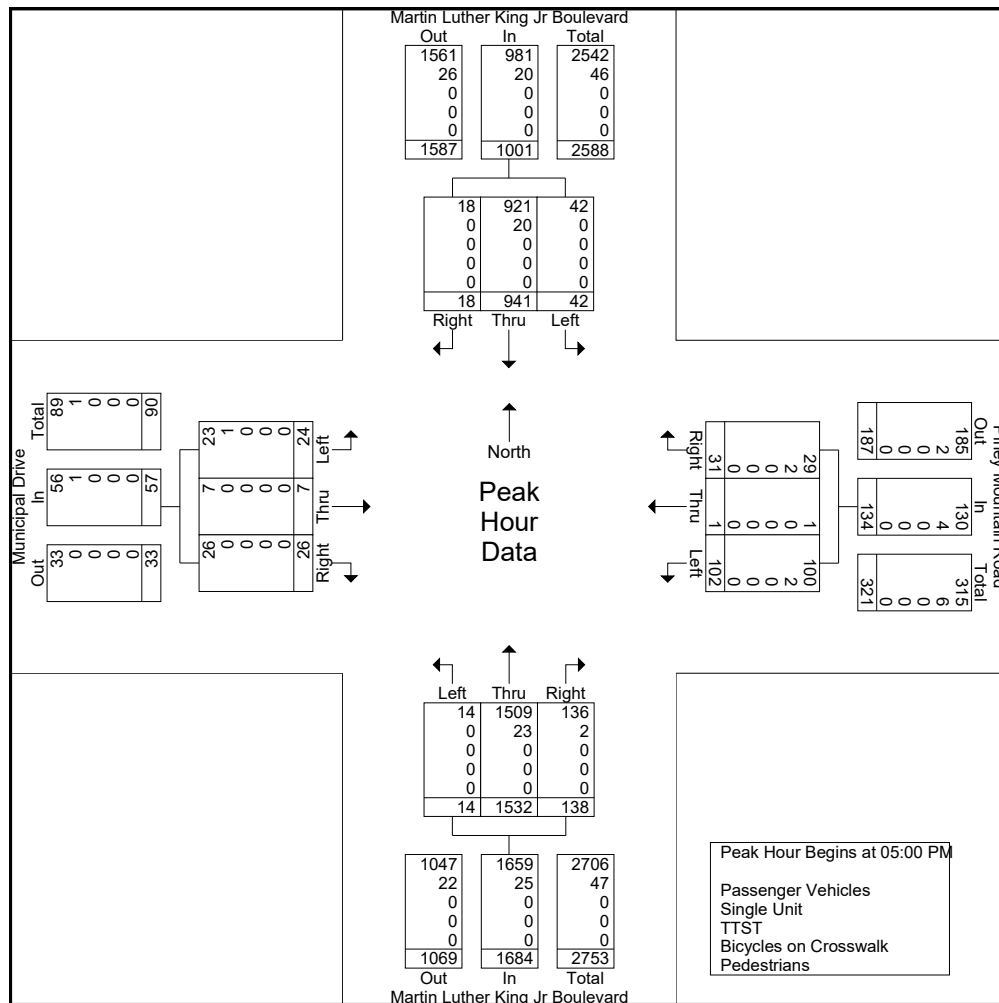
File Name : MLK@PineyMountain

Site Code :

Start Date : 1/28/2020

Page No : 4

	Martin Luther King Jr Boulevard Southbound				Piney Mountain Road Westbound				Martin Luther King Jr Boulevard Northbound				Municipal Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	10	205	4	219	14	1	7	22	2	379	30	411	8	1	4	13	665
05:15 PM	5	261	8	274	25	0	9	34	3	407	33	443	1	1	6	8	759
05:30 PM	9	232	6	247	26	0	6	32	8	403	41	452	15	2	10	27	758
05:45 PM	18	243	0	261	37	0	9	46	1	343	34	378	0	3	6	9	694
Total Volume	42	941	18	1001	102	1	31	134	14	1532	138	1684	24	7	26	57	2876
% App. Total	4.2	94	1.8		76.1	0.7	23.1		0.8	91	8.2		42.1	12.3	45.6		
PHF	.583	.901	.563	.913	.689	.250	.861	.728	.438	.941	.841	.931	.400	.583	.650	.528	.947
Passenger Vehicles	42	921	18	981	100	1	29	130	14	1509	136	1659	23	7	26	56	2826
% Passenger Vehicles	100	97.9	100	98.0	98.0	100	93.5	97.0	100	98.5	98.6	98.5	95.8	100	100	98.2	98.3
Single Unit	0	20	0	20	2	0	2	4	0	23	2	25	1	0	0	1	50
% Single Unit	0	2.1	0	2.0	2.0	0	6.5	3.0	0	1.5	1.4	1.5	4.2	0	0	1.8	1.7
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



C

Crash Data

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Study Criteria Summary

County: ORANGE **City:** All and Rural
Date: 02/01/2015 to 01/31/2020 **Study:** 41000060169
Location: N Estes Dr (SR 1750/SR 1780) form 150 ft West of NC 86 (Martin Luther King Jr) to 150 ft East of Caswell Rd

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
1	105338598	1.716	12/17/2017 09:48	REAR END, SLOW OR STOP	\$ 900	0	0	0	1	1	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed:	0 MPH Dir: E	Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed:	5 MPH Dir: E	Veh Mnvr/Ped Actn:				4	Obj Strk:					
2	105555884	1.716	07/20/2018 19:47	REAR END, SLOW OR STOP	\$ 1000	0	0	0	0	1	2	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed:	0 MPH Dir: E	Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 4	Alchl/Drugs:	0	Speed:	15 MPH Dir: E	Veh Mnvr/Ped Actn:				4	Obj Strk:					
3	105963780	1.717	08/14/2019 06:37	REAR END, SLOW OR STOP	\$ 2100	0	0	0	0	2	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed:	15 MPH Dir: E	Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed:	0 MPH Dir: E	Veh Mnvr/Ped Actn:				1	Obj Strk:					
4	104924595	1.724	10/24/2016 14:53	REAR END, SLOW OR STOP	\$ 1000	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	1	Speed:	0 MPH Dir: E	Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 4	Alchl/Drugs:	0	Speed:	0 MPH Dir: E	Veh Mnvr/Ped Actn:				11	Obj Strk:					
5	104355424	1.730	04/10/2015 17:54	LEFT TURN, SAME ROADWAY	\$ 3800	0	0	0	0	1	1	1	3	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed:	30 MPH Dir: N	Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed:	30 MPH Dir: S	Veh Mnvr/Ped Actn:				8	Obj Strk:					
6	104369919	1.730	05/04/2015 09:21	PEDALCYCLIST	\$ 100	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed:	0 MPH Dir: W	Veh Mnvr/Ped Actn:				7	Obj Strk:					
Unit	2 : 24	Alchl/Drugs:	0	Speed:	0 MPH Dir:	Veh Mnvr/Ped Actn:					Obj Strk:					
7	104490927	1.730	09/08/2015 16:06	LEFT TURN, SAME ROADWAY	\$ 12000	0	0	0	2	1	1	1	1	0	3	1
Unit	1 : 2	Alchl/Drugs:	0	Speed:	25 MPH Dir: N	Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed:	25 MPH Dir: SE	Veh Mnvr/Ped Actn:				8	Obj Strk:					
8	104582812	1.730	11/22/2015 01:42	ANGLE	\$ 12000	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed:	40 MPH Dir: S	Veh Mnvr/Ped Actn:				4	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	2 : 5	Alchl/Drgs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
9	104628361	1.730	01/18/2016 15:54	LEFT TURN, SAME ROADWAY	\$ 10000	0	0	0	2	1	1	1	1	0	3	1
Unit	1 : 5	Alchl/Drgs:	0	Speed: 15 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 40 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
10	104667241	1.730	02/19/2016 19:05	LEFT TURN, SAME ROADWAY	\$ 10000	0	0	0	1	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 5	Alchl/Drgs:	0	Speed: 45 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
11	104687062	1.730	03/08/2016 18:00	LEFT TURN, SAME ROADWAY	\$ 13000	0	0	0	1	1	2	1	1	0	3	1
Unit	1 : 2	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: SE		Veh Mnvr/Ped Actn:				8	Obj Strk:					
12	104811851	1.730	07/09/2016 18:40	HEAD ON	\$ 8000	0	0	2	0	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
13	105064389	1.730	04/03/2017 20:46	LEFT TURN, SAME ROADWAY	\$ 6700	0	0	0	0	2	4	2	3	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	3 : 4	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
14	105061198	1.730	04/03/2017 21:05	REAR END, TURN	\$ 1700	0	0	0	0	2	4	2	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
15	105070133	1.730	04/04/2017 20:29	LEFT TURN, DIFFERENT ROADWAYS	\$ 1700	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 15 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
16	105328703	1.730	12/10/2017 18:01	ANGLE	\$ 1500	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				7	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
17	105748689	1.730	12/19/2017 21:14	REAR END, SLOW OR STOP	\$ 2250	0	0	0	0	1	4	1	1	0	12	3
Unit	1 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: W		Veh Mnvr/Ped Actn:				1	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:					
18	105472750	1.730	05/01/2018 20:35	LEFT TURN, DIFFERENT ROADWAYS	\$ 3500	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 15 MPH Dir: W		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
19	105578758	1.730	08/15/2018 16:08	RIGHT TURN, DIFFERENT ROADWAYS	\$ 0	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 5 MPH Dir: W		Veh Mnvr/Ped Actn:				12	Obj Strk:					
Unit	2 : 23	Alchl/Drgs:	0	Speed: 0 MPH Dir:		Veh Mnvr/Ped Actn:					Obj Strk:					
20	105578503	1.730	08/15/2018 16:20	REAR END, TURN	\$ 3150	0	0	0	0	1	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
21	105769948	1.730	02/06/2019 21:42	HEAD ON	\$ 8000	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 25 MPH Dir: W		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
22	105924178	1.730	06/19/2019 11:21	ANGLE	\$ 13500	0	0	2	0	1	1	2	1	0	3	1
Unit	1 : 5	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: NW		Veh Mnvr/Ped Actn:				8	Obj Strk:					
23	105947413	1.730	07/20/2019 21:29	LEFT TURN, SAME ROADWAY	\$ 6000	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 10 MPH Dir: SW		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 10	Alchl/Drgs:	0	Speed: 25 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
24	105956966	1.730	08/01/2019 10:44	ANGLE	\$ 3300	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 25 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
25	105991720	1.730	08/30/2019 16:33	LEFT TURN, SAME ROADWAY	\$ 30000	0	0	1	2	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 5 MPH Dir: N		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
26	104929528	1.732	11/06/2016 01:15	RAN OFF ROAD - RIGHT	\$ 3000	0	0	0	0	1	4	1	3	0	0	
Unit	1 : 1	Alchl/Drgs:	1	Speed: 30 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
27	105498712	1.732	05/26/2018 21:34	SIDESWIPE, SAME DIRECTION	\$ 4000	0	0	0	1	1	4	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 5 MPH	Dir: W	Veh Mnvr/Ped Actn: 5		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
28	105645166	1.740	10/13/2018 19:15	REAR END, SLOW OR STOP	\$ 1250	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 10 MPH	Dir: E	Veh Mnvr/Ped Actn: 4		Obj Strk:									
Unit	2 : 4	Alchl/Drugs: 0	Speed: 0 MPH	Dir: E	Veh Mnvr/Ped Actn: 1		Obj Strk:									
29	106013175	1.746	09/26/2019 17:33	REAR END, SLOW OR STOP	\$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 10 MPH	Dir: W	Veh Mnvr/Ped Actn: 12		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
30	105792928	1.749	02/22/2019 14:49	REAR END, SLOW OR STOP	\$ 3550	0	0	0	2	2	1	3	1	0	3	1
Unit	1 : 4	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 20 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk:									
31	104975623	1.764	12/06/2016 16:56	SIDESWIPE, SAME DIRECTION	\$ 3000	0	0	0	0	2	2	3	3	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 35 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 35 MPH	Dir: W	Veh Mnvr/Ped Actn: 5		Obj Strk:									
32	104355632	1.770	03/07/2015 19:22	REAR END, SLOW OR STOP	\$ 3750	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 8 MPH	Dir: W	Veh Mnvr/Ped Actn: 11		Obj Strk:									
33	106032019	1.770	10/01/2019 16:23	SIDESWIPE, SAME DIRECTION	\$ 4000	0	0	0	0	1	1	1	1	0	0	
Unit	1 : 1	Alchl/Drugs: 0	Speed: 15 MPH	Dir: W	Veh Mnvr/Ped Actn: 5		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 15 MPH	Dir: W	Veh Mnvr/Ped Actn: 5		Obj Strk:									
34	104459774	1.780	08/11/2015 18:51	RIGHT TURN, DIFFERENT ROADWAYS	\$ 1300	0	0	0	0	2	1	3	1	0	13	2
Unit	1 : 4	Alchl/Drugs: 0	Speed: 35 MPH	Dir: E	Veh Mnvr/Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 10 MPH	Dir: E	Veh Mnvr/Ped Actn: 7		Obj Strk:									
35	105987037	1.780	08/29/2019 08:09	REAR END, SLOW OR STOP	\$ 14200	0	0	0	2	1	1	1	3	0	13	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 0 MPH	Dir: E	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	2 : 3	Alchl/Drugs: 0	Speed: 0 MPH	Dir: E	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	3 : 5	Alchl/Drugs: 0	Speed: 35 MPH	Dir: E	Veh Mnvr/Ped Actn: 4		Obj Strk:									

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
36	106042065	1.780	10/21/2019 17:55	REAR END, SLOW OR STOP	\$ 2500	0	0	0	0	1	2	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 20 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk:									
37	105339137	1.782	12/14/2017 17:24	REAR END, SLOW OR STOP	\$ 6000	0	0	0	1	1	2	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	2 : 4	Alchl/Drugs: 0	Speed: 30 MPH	Dir: W	Veh Mnvr/Ped Actn: 11		Obj Strk:									
38	104573031	1.790	11/09/2015 13:28	RAN OFF ROAD - LEFT	\$ 1500	0	0	0	0	2	1	3	3	0		
Unit	1 : 1	Alchl/Drugs: 0	Speed: 10 MPH	Dir: S	Veh Mnvr/Ped Actn: 4		Obj Strk: 56									
39	104628690	1.820	01/18/2016 19:19	RAN OFF ROAD - RIGHT	\$ 8000	0	0	0	0	1	5	1	1	0	0	
Unit	1 : 2	Alchl/Drugs: 0	Speed: 35 MPH	Dir: E	Veh Mnvr/Ped Actn: 4		Obj Strk: 33									
40	105011787	1.895	02/11/2017 10:19	RAN OFF ROAD - RIGHT	\$ 1500	0	0	0	1	1	1	1	3	0		
Unit	1 : 4	Alchl/Drugs: 0	Speed: 35 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk: 33									
41	104918134	1.930	10/25/2016 17:30	REAR END, SLOW OR STOP	\$ 2900	0	0	0	0	1	1	1	3	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 20 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 20 MPH	Dir: W	Veh Mnvr/Ped Actn: 1		Obj Strk:									
Unit	3 : 1	Alchl/Drugs: 0	Speed: 20 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk:									
42	105909282	1.930	06/09/2019 12:28	REAR END, SLOW OR STOP	\$ 5500	0	0	1	1	1	1	2	3	0	0	
Unit	1 : 1	Alchl/Drugs: 0	Speed: 35 MPH	Dir: E	Veh Mnvr/Ped Actn: 4		Obj Strk:									
Unit	2 : 4	Alchl/Drugs: 0	Speed: 30 MPH	Dir: E	Veh Mnvr/Ped Actn: 11		Obj Strk:									
43	104775963	1.948	06/10/2016 10:39	HEAD ON	\$ 17000	0	0	2	0	1	1	1	3	0	0	2
Unit	1 : 4	Alchl/Drugs: 0	Speed: 35 MPH	Dir: E	Veh Mnvr/Ped Actn: 4		Obj Strk:									
Unit	2 : 4	Alchl/Drugs: 0	Speed: 30 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk:									
44	104929539	1.988	11/04/2016 13:55	RAN OFF ROAD - LEFT	\$ 2600	0	0	0	2	1	1	1	1	0	13	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 30 MPH	Dir: W	Veh Mnvr/Ped Actn: 11		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 0 MPH	Dir: W	Veh Mnvr/Ped Actn: 11		Obj Strk:									
45	105017900	1.995	02/06/2017 16:18	ANIMAL	\$ 4000	0	0	0	0	1	1	1	1	0	0	
Unit	1 : 1	Alchl/Drugs: 0	Speed: 35 MPH	Dir: W	Veh Mnvr/Ped Actn: 4		Obj Strk: 17									

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
46	104355660	2.030	03/17/2015 17:00	RAN OFF ROAD - RIGHT	\$ 2000	0	0	0	0	1	1	1	3	0	1	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 25 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:			37		
Unit	2 : 5	Alchl/Drgs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
47	104516501	2.030	10/07/2015 17:51	REAR END, SLOW OR STOP	\$ 3200	0	0	0	1	1	1	1	1	0		
Unit	1 : 4	Alchl/Drgs:	0	Speed: 20 MPH Dir: W		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 5	Alchl/Drgs:	0	Speed: 5 MPH Dir: W		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	3 : 4	Alchl/Drgs:	0	Speed: 3 MPH Dir: W		Veh Mnvr/Ped Actn:				11	Obj Strk:					
48	105764719	2.030	02/01/2019 18:56	REAR END, SLOW OR STOP	\$ 6800	0	0	0	1	1	4	1	1	0	0	2
Unit	1 : 1	Alchl/Drgs:	0	Speed: 15 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 5	Alchl/Drgs:	0	Speed: 10 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	3 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
49	105687195	2.105	11/14/2018 08:03	REAR END, SLOW OR STOP	\$ 3000	0	0	0	0	1	1	2	1	0	0	
Unit	1 : 1	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	3 : 4	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
50	105105627	2.130	05/12/2017 14:59	ANIMAL	\$ 1500	0	0	0	0	1	1	1	1	0		2
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:			17		
51	104364242	2.160	04/29/2015 17:27	REAR END, SLOW OR STOP	\$ 2000	0	0	0	0	1	1	1	3	0	0	2
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
52	104927902	2.160	10/31/2016 17:20	REAR END, SLOW OR STOP	\$ 3500	0	0	0	0	1	1	1	1	0	0	2
Unit	1 : 4	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:					
53	105109124	2.180	05/16/2017 15:14	REAR END, SLOW OR STOP	\$ 3000	0	0	0	0	1	1	1	1	0		2
Unit	1 : 4	Alchl/Drgs:	0	Speed: 25 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: E		Veh Mnvr/Ped Actn:				1	Obj Strk:					
54	106152992	2.201	01/02/2020 17:14	REAR END, SLOW OR STOP	\$ 4000	0	0	0	0	2	2	1	1	0	0	
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	2 : 1	Alchl/Drgs:	0	Speed:	0 MPH Dir:	W	Veh Mnvr/Ped Actn:				1	Obj Strk:				
55	105687252	2.207	11/09/2018 19:05	ANIMAL	\$ 3000	0	0	1	0	2	4	3	1	0	0	
Unit	1 : 32	Alchl/Drgs:	7	Speed:	35 MPH Dir:	W	Veh Mnvr/Ped Actn:				4	Obj Strk: 17				
Unit	2 : 1	Alchl/Drgs:	0	Speed:	35 MPH Dir:	E	Veh Mnvr/Ped Actn:				4	Obj Strk: 17				

**Legend for
Report Details:**

Acc No - Accident Number
Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
Condition: R - Road Surface, L - Ambient Light, W - Weather
Rd Ch - Road Character
Rd Ci - Roadway Contributing Circumstances
Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
Alchl/Drgs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	55	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	22	40.00
Total Injury Crashes	22	40.00
Property Damage Only Crashes	33	60.00
Night Crashes	17	30.91
Wet Crashes	9	16.36
Alcohol/Drugs Involvement Crashes	2	3.64

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	55	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	6	10.91
Class C Crashes	16	29.09
Property Damage Only Crashes	33	60.00

Vehicle Exposure Statistics

Annual ADT = 15500

Total Length = 0.514 (Miles) 0.827 (Kilometers)

Total Vehicle Exposure = 14.55 (MVMT) 23.41 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	378.07	234.92
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	151.23	93.97
Night Crash Rate	116.86	72.61
Wet Crash Rate	61.87	38.44
EPDO Rate	1497.14	930.28

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Miscellaneous Statistics

Severity Index =	3.96
EPDO Crash Index =	217.80
Estimated Property Damage Total = \$	278750.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	4	7.27
ANIMAL	3	5.45
HEAD ON	3	5.45
LEFT TURN, DIFFERENT ROADWAYS	2	3.64
LEFT TURN, SAME ROADWAY	8	14.55
PEDALCYCLIST	1	1.82
RAN OFF ROAD - LEFT	2	3.64
RAN OFF ROAD - RIGHT	4	7.27
REAR END, SLOW OR STOP	21	38.18
REAR END, TURN	2	3.64
RIGHT TURN, DIFFERENT ROADWAYS	2	3.64
SIDESWIPE, SAME DIRECTION	3	5.45

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	0	0.00
Class B Injuries	9	27.27
Class C Injuries	24	72.73
Total Non-Fatal Injuries	33	100.00
Total Injuries	33	100.00

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	3	5.45
Feb	6	10.91
Mar	3	5.45
Apr	5	9.09
May	5	9.09
Jun	3	5.45
Jul	3	5.45
Aug	7	12.73
Sep	2	3.64
Oct	7	12.73
Nov	6	10.91
Dec	5	9.09

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	10	18.18
Tue	11	20.00
Wed	8	14.55
Thu	5	9.09
Fri	10	18.18
Sat	6	10.91
Sun	5	9.09

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	2	3.64
0200-0259	0	0.00
0300-0359	0	0.00
0400-0459	0	0.00
0500-0559	0	0.00
0600-0659	1	1.82
0700-0759	0	0.00
0800-0859	2	3.64
0900-0959	2	3.64
1000-1059	3	5.45
1100-1159	1	1.82
1200-1259	1	1.82
1300-1359	2	3.64
1400-1459	3	5.45
1500-1559	2	3.64
1600-1659	7	12.73
1700-1759	10	18.18
1800-1859	5	9.09
1900-1959	6	10.91
2000-2059	3	5.45
2100-2159	5	9.09
2200-2259	0	0.00
2300-2359	0	0.00

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	28	4	0	32
Dark	14	3	0	17
Other	4	2	0	6
Total	46	9	0	55

Object Struck Summary

Object Type	Times Struck	Percent of Total
ANIMAL	4	40.00
CATCH BASIN OR CULVERT ON SHOULDER	1	10.00
OFFICIAL HIGHWAY SIGN NON-BREAKAWAY	1	10.00
PEDALCYCLIST	2	20.00
TREE	2	20.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
LIGHT TRUCK (MINI-VAN, PANEL)	1	0.91
PASSENGER CAR	65	59.09
PEDALCYCLE	1	0.91
PEDESTRIAN	1	0.91
PICKUP	4	3.64
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	1	0.91
SPORT UTILITY	28	25.45
UNKNOWN	1	0.91
VAN	8	7.27

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2015	10	0	3	7
2016	12	0	6	6
2017	11	0	3	8
2018	8	0	3	5
2019	13	0	7	6
2020	1	0	0	1
Total	55	0	22	33

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2015	0	4
2016	0	10
2017	0	3
2018	0	3
2019	0	13
2020	0	0
Total	0	33

Miscellaneous Totals

Year	Property Damage	EPDO Index
2015	\$ 41650	32.20
2016	\$ 82000	56.40
2017	\$ 30750	33.20
2018	\$ 18900	30.20
2019	\$ 101450	64.80
2020	\$ 4000	1.00
Total	\$ 278750	217.80

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2015	2	1	3	2	1	0	1
2016	3	0	3	3	0	1	2

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Year	Left Turn	Right Turn	Rear End	Run Off Road &		Angle	Side Swipe	Other
				Fixed Object				
2017	2	0	5	1		1	0	2
2018	1	1	4	0		0	1	1
2019	2	0	7	0		2	1	1
2020	0	0	1	0		0	0	0
Total	10	2	23	6		4	3	7

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Strip Diagram

Features	Milepost	Crash IDs
NC 86 SR 1750 SR 1780 MARTIN LUTHER KING	1.70	
	1.71	
	1.72	105338598 105555884 105963780 104924595
	1.73	104355424 104369919 104490927 104582812
		104628361 104667241 104687062 104811851
		105064389 105061198 105070133 105328703
		105748689 105472750 105578758 105578503
		105769948 105924178 105947413 105956966
		105991720 104929528 105498712
	1.74	105645166
	1.75	106013175 105792928
	1.76	104975623
	1.77	104355632 106032019
	1.78	104459774 105987037 106042065 105339137
	1.79	104573031
	1.80	
	1.81	
	1.82	104628690
	1.83	
	1.84	
	1.85	
	1.86	
	1.87	
	1.88	
	1.89	105011787
	1.90	
	1.91	
	1.92	
	1.93	104918134 105909282
	1.94	
	1.95	104775963
	1.96	
	1.97	
	1.98	
	1.99	104929539
	2.00	105017900
	2.01	
	2.02	
SOMERSET	2.03	104355660 104516501 105764719
	2.04	
	2.05	

**North Carolina Department of Transportation
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Features	Milepost	Crash IDs
CASWELL	2.06	
	2.07	
	2.08	
	2.09	
	2.10	
	2.11	105687195
	2.12	
	2.13	105105627
	2.14	
	2.15	
	2.16	104364242 104927902
	2.17	
	2.18	105109124
	2.19	
	2.20	106152992
	2.21	105687252
	2.22	

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Study Criteria Summary

County: ORANGE **City:** All and Rural
Date: 02/01/2015 to 01/31/2020 **Study:** 41000060170
Location: NC 86 (Martin Luther King Jr Blvd) From Piney Mountain Rd (Behind Stop Bar) to 150 ft South of Estes Dr (SR 1750/SR1780)

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
1	105046446	3.060	03/21/2017 08:07	REAR END, SLOW OR STOP	\$ 2450	0	0	0	1	1	1	1	1	0	0	
Unit	1 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
2	106083593	3.063	11/19/2019 15:17	REAR END, SLOW OR STOP	\$ 3500	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 25 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
3	105956958	3.064	08/05/2019 14:50	REAR END, SLOW OR STOP	\$ 6500	0	0	0	0	1	1	2	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
4	104518633	3.070	09/30/2015 17:56	LEFT TURN, SAME ROADWAY	\$ 4500	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 15 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
5	104869551	3.074	09/06/2016 14:17	REAR END, SLOW OR STOP	\$ 4000	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 15 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
6	105278687	3.074	11/02/2017 17:42	LEFT TURN, DIFFERENT ROADWAYS	\$ 2500	0	0	0	0	1	1	2	1	0	3	1
Unit	1 : 6	Alchl/Drugs:	0	Speed: 10 MPH Dir: SW		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
7	105950723	3.081	07/30/2019 12:20	REAR END, SLOW OR STOP	\$ 1000	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 3	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
8	104355424	3.083	04/10/2015 17:54	LEFT TURN, SAME ROADWAY	\$ 3800	0	0	0	0	1	1	1	3	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 30 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
9	104490927	3.083	09/08/2015 16:06	LEFT TURN, SAME ROADWAY	\$ 12000	0	0	0	2	1	1	1	1	0	3	1
Unit	1 : 2	Alchl/Drgs:	0	Speed: 25 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 25 MPH Dir: SE		Veh Mnvr/Ped Actn:				8	Obj Strk:					
10	104582812	3.083	11/22/2015 01:42	ANGLE	\$ 12000	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 40 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 5	Alchl/Drgs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
11	104628361	3.083	01/18/2016 15:54	LEFT TURN, SAME ROADWAY	\$ 10000	0	0	0	2	1	1	1	1	0	3	1
Unit	1 : 5	Alchl/Drgs:	0	Speed: 15 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 40 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
12	104667241	3.083	02/19/2016 19:05	LEFT TURN, SAME ROADWAY	\$ 10000	0	0	0	1	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 5	Alchl/Drgs:	0	Speed: 45 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
13	104687062	3.083	03/08/2016 18:00	LEFT TURN, SAME ROADWAY	\$ 13000	0	0	0	1	1	2	1	1	0	3	1
Unit	1 : 2	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: SE		Veh Mnvr/Ped Actn:				8	Obj Strk:					
14	104811851	3.083	07/09/2016 18:40	HEAD ON	\$ 8000	0	0	2	0	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
15	105064389	3.083	04/03/2017 20:46	LEFT TURN, SAME ROADWAY	\$ 6700	0	0	0	0	2	4	2	3	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 30 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	3 : 4	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
16	105061198	3.083	04/03/2017 21:05	REAR END, TURN	\$ 1700	0	0	0	0	2	4	2	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				8	Obj Strk:					
17	105070133	3.083	04/04/2017 20:29	LEFT TURN, DIFFERENT ROADWAYS	\$ 1700	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 15 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
18	105214438	3.083	09/01/2017 11:05	REAR END, SLOW OR STOP	\$ 1800	0	0	0	0	1	1	2	1	0	3	2
Unit	1 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
19	105328703	3.083	12/10/2017 18:01	ANGLE	\$ 1500	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				7	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
20	105364837	3.083	01/10/2018 16:44	ANGLE	\$ 10000	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 15 MPH Dir: W		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
21	105383107	3.083	02/02/2018 09:01	REAR END, SLOW OR STOP	\$ 4800	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 3 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 25 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
22	105472750	3.083	05/01/2018 20:35	LEFT TURN, DIFFERENT ROADWAYS	\$ 3500	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 15 MPH Dir: W		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 30 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
23	105578758	3.083	08/15/2018 16:08	RIGHT TURN, DIFFERENT ROADWAYS	\$ 0	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 5 MPH Dir: W		Veh Mnvr/Ped Actn:				12	Obj Strk:					
Unit	2 : 23	Alchl/Drugs:	0	Speed: 0 MPH Dir:		Veh Mnvr/Ped Actn:					Obj Strk:					
24	105578503	3.083	08/15/2018 16:20	REAR END, TURN	\$ 3150	0	0	0	0	1	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: E		Veh Mnvr/Ped Actn:				8	Obj Strk:					
25	105769948	3.083	02/06/2019 21:42	HEAD ON	\$ 8000	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 25 MPH Dir: W		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
26	105924178	3.083	06/19/2019 11:21	ANGLE	\$ 13500	0	0	2	0	1	1	2	1	0	3	1
Unit	1 : 5	Alchl/Drugs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 10 MPH Dir: NW		Veh Mnvr/Ped Actn:				8	Obj Strk:					

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						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
27	105947413	3.083	07/20/2019 21:29	LEFT TURN, SAME ROADWAY	\$ 6000	0	0	0	0	1	4	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 10 MPH Dir: SW		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 10	Alchl/Drugs:	0	Speed: 25 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
28	105956966	3.083	08/01/2019 10:44	ANGLE	\$ 3300	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 25 MPH Dir: E		Veh Mnvr/Ped Actn:				4	Obj Strk:					
29	105991720	3.083	08/30/2019 16:33	LEFT TURN, SAME ROADWAY	\$ 30000	0	0	1	2	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 5 MPH Dir: N		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
30	104463607	3.089	08/12/2015 19:19	REAR END, SLOW OR STOP	\$ 8000	0	0	1	2	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 50 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 5	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
31	104868507	3.089	08/29/2016 19:19	REAR END, SLOW OR STOP	\$ 1600	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 32	Alchl/Drugs:	7	Speed: 15 MPH Dir: SE		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
32	106090208	3.089	11/12/2019 15:11	REAR END, SLOW OR STOP	\$ 3450	0	0	0	0	2	1	3	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 1	Alchl/Drugs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
33	104377944	3.090	05/06/2015 19:14	REAR END, SLOW OR STOP	\$ 1200	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				12	Obj Strk:					
34	104641695	3.093	02/09/2016 18:18	LEFT TURN, SAME ROADWAY	\$ 1600	0	0	0	0	1	4	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 15 MPH Dir: N		Veh Mnvr/Ped Actn:				7	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 15 MPH Dir: N		Veh Mnvr/Ped Actn:				8	Obj Strk:					

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
35	105277831	3.093	10/27/2017 10:00	REAR END, SLOW OR STOP	\$ 2600	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
36	104975615	3.096	12/06/2016 08:13	REAR END, SLOW OR STOP	\$ 3000	0	0	0	0	2	1	3	3	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
37	105319152	3.098	12/02/2017 10:21	REAR END, SLOW OR STOP	\$ 3600	0	0	0	0	2	1	3	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 4	Alchl/Drgs:	0	Speed: 25 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
38	104540526	3.101	10/24/2015 14:00	REAR END, SLOW OR STOP	\$ 3300	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
39	104975618	3.102	12/06/2016 19:00	RAN OFF ROAD - RIGHT	\$ 2000	0	0	0	0	2	4	3	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	3	Speed: 30 MPH Dir: N		Veh Mnvr/Ped Actn:				16	Obj Strk:					
40	105041349	3.110	03/10/2017 16:25	OTHER NON-COLLISION	\$ 4000	0	0	0	0	1	1	1	1	1	3	3
Unit	1 : 1	Alchl/Drgs:	7	Speed: 15 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 4	Alchl/Drgs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
41	105118457	3.110	05/24/2017 15:57	REAR END, SLOW OR STOP	\$ 900	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 7 MPH Dir: SE		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: SE		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: SE		Veh Mnvr/Ped Actn:				1	Obj Strk:					
42	105302117	3.110	11/18/2017 15:47	REAR END, SLOW OR STOP	\$ 8450	0	0	0	1	1	1	2	1	0		
Unit	1 : 2	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
43	105950720	3.110	07/30/2019 18:03	REAR END, SLOW OR STOP	\$ 1000	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 2	Alchl/Drgs:	0	Speed: 10 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					

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						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
44	105550242	3.111	07/18/2018 16:49	RAN OFF ROAD - LEFT	\$ 800	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 15 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
45	104420358	3.157	06/24/2015 22:45	OTHER NON-COLLISION	\$ 6350	0	0	0	0	1	4	1	1	0		
Unit	1 : 1	Alchl/Drugs:	3	Speed: 75 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:		55			
46	104355678	3.160	03/27/2015 11:49	REAR END, SLOW OR STOP	\$ 3000	0	0	0	0	2	1	3	2	0	0	1
Unit	1 : 1	Alchl/Drugs:	7	Speed: 45 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	7	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
47	105241684	3.220	10/02/2017 07:46	REAR END, SLOW OR STOP	\$ 5475	0	0	0	0	1	1	1	1	0	0	
Unit	1 : 4	Alchl/Drugs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
48	105487456	3.220	05/19/2018 12:26	REAR END, SLOW OR STOP	\$ 6200	0	0	0	0	2	1	3	1	0	5	1
Unit	1 : 4	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
49	105775194	3.220	02/08/2019 14:03	REAR END, SLOW OR STOP	\$ 11500	0	0	0	3	1	1	2	1	0	13	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 4	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 4	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	4 : 4	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	5 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
50	104576492	3.223	11/10/2015 07:29	REAR END, SLOW OR STOP	\$ 10500	0	0	0	0	2	1	3	1	0		
Unit	1 : 1	Alchl/Drugs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				12	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				12	Obj Strk:					
Unit	3 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
51	105170302	3.223	07/20/2017 08:58	REAR END, SLOW OR STOP	\$ 8775	0	0	0	0	1	1	1	1	0	14	1
Unit	1 : 2	Alchl/Drugs:	0	Speed: 25 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
52	104441097	3.227	07/20/2015 08:39	REAR END, SLOW OR STOP	\$ 6800	0	0	0	1	1	1	1	1	0	14	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					

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						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	2 : 2	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
53	105775541	3.229	02/11/2019 08:37	REAR END, SLOW OR STOP	\$ 8500	0	0	0	0	2	1	3	1	0	14	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 15 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
54	104889699	3.230	10/03/2016 12:01	REAR END, SLOW OR STOP	\$ 5000	0	0	0	0	1	1	1	1	0	14	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 5 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
55	105223145	3.230	09/11/2017 17:53	RAN OFF ROAD - RIGHT	\$ 5000	0	0	0	0	2	1	2	1	0		
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: N		Veh Mnvr/Ped Actn:				15	Obj Strk: 40					
56	105924170	3.230	06/19/2019 16:20	REAR END, SLOW OR STOP	\$ 11500	0	0	0	1	1	1	2	1	0	5	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
57	106091641	3.233	11/01/2019 08:42	PEDESTRIAN	\$ 100	0	0	1	0	1	1	1	1	0	9	1
Unit	1 : 24	Alchl/Drgs:	0	Speed: 0 MPH Dir:		Veh Mnvr/Ped Actn:					Obj Strk: 14					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				12	Obj Strk: 14					
58	104628338	3.240	01/26/2016 17:28	REAR END, SLOW OR STOP	\$ 8600	0	0	0	0	2	4	2	1	0	0	
Unit	1 : 3	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 4	Alchl/Drgs:	0	Speed: 25 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
59	104654600	3.240	02/18/2016 08:38	REAR END, SLOW OR STOP	\$ 4500	0	0	0	1	1	1	1	1	0		
Unit	1 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 4	Alchl/Drgs:	0	Speed: 20 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
60	104943056	3.240	11/14/2016 12:37	REAR END, SLOW OR STOP	\$ 2100	0	0	0	0	2	1	3	1	0	14	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
61	105310142	3.240	11/27/2017 10:05	REAR END, SLOW OR STOP	\$ 8400	0	0	0	0	1	1	1	3	0	0	2
Unit	1 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit	3 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
62	105612691	3.240	09/18/2018 07:19	REAR END, SLOW OR STOP	\$ 450	0	0	0	2	1	1	1	1	0	14	2
Unit	1 : 4	Alchl/Drgs:	0	Speed: 10 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
63	104436650	3.300	07/14/2015 08:01	REAR END, SLOW OR STOP	\$ 9750	0	0	0	0	1	1	1	1	0		3
Unit	1 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 2	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	3 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
64	104889332	3.340	09/21/2016 08:40	REAR END, SLOW OR STOP	\$ 4100	0	0	0	0	1	1	1	1	0	0	
Unit	1 : 1	Alchl/Drgs:	0	Speed: 35 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 5 MPH Dir: S		Veh Mnvr/Ped Actn:				11	Obj Strk:					
65	104547035	3.344	10/28/2015 11:49	REAR END, SLOW OR STOP	\$ 1400	0	0	0	0	2	1	3	1	0	14	1
Unit	1 : 2	Alchl/Drgs:	0	Speed: 5 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	0	Speed: 30 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
66	105605075	3.363	09/04/2018 10:37	REAR END, SLOW OR STOP	\$ 9080	0	0	0	0	1	1	2	1	0	3	1
Unit	1 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				1	Obj Strk:					
Unit	2 : 3	Alchl/Drgs:	0	Speed: 35 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
67	104355920	3.368	04/08/2015 17:55	REAR END, SLOW OR STOP	\$ 1250	0	0	0	0	1	1	1		0		
Unit	1 : 1	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				11	Obj Strk:					
Unit	2 : 1	Alchl/Drgs:	7	Speed: 10 MPH Dir: N		Veh Mnvr/Ped Actn:				4	Obj Strk:					
68	104355625	3.372	03/06/2015 09:34	ANGLE	\$ 2200	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drgs:	0	Speed: 10 MPH Dir: NW		Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 2	Alchl/Drgs:	0	Speed: 25 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
69	105307178	3.372	11/30/2017 09:15	LEFT TURN, SAME ROADWAY	\$ 7000	0	0	0	0	1	1	1		0		
Unit	1 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: S		Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 4	Alchl/Drgs:	0	Speed: 0 MPH Dir: N		Veh Mnvr/Ped Actn:				8	Obj Strk:					
70	105365499	3.372	01/12/2018 08:53	REAR END, SLOW OR STOP	\$ 1650	0	0	0	0	2	1	2	1	0	3	1
Unit	1 : 2	Alchl/Drgs:	0	Speed: 15 MPH Dir: SE		Veh Mnvr/Ped Actn:				11	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op

Unit 2 : 1 Alchl/Drugs: 1 Speed: 5 MPH Dir: SE Veh Mnvr/Ped Actn: 16 Obj Strk:

Unit 3 : 1 Alchl/Drugs: 0 Speed: 0 MPH Dir: SE Veh Mnvr/Ped Actn: 1 Obj Strk:

**Legend for
Report Details:**

Acc No - Accident Number
Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
Condition: R - Road Surface, L - Ambient Light, W - Weather
Rd Ch - Road Character
Rd Ci - Roadway Contributing Circumstances
Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
Alchl/Drugs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	70	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	23	32.86
Total Injury Crashes	23	32.86
Property Damage Only Crashes	47	67.14
Night Crashes	13	18.57
Wet Crashes	15	21.43
Alcohol/Drugs Involvement Crashes	1	1.43

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	70	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	5	7.14
Class C Crashes	18	25.71
Property Damage Only Crashes	47	67.14

Vehicle Exposure Statistics

Annual ADT = 27500

Total Length = 0.317 (Miles)

0.51 (Kilometers)

Total Vehicle Exposure = 15.92 (MVMT)

25.62 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	439.75	273.25
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	144.49	89.78
Night Crash Rate	81.67	50.75
Wet Crash Rate	94.23	58.55
EPDO Rate	1508.97	937.63

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Miscellaneous Statistics

Severity Index =	3.43
EPDO Crash Index =	240.20
Estimated Property Damage Total = \$	383580.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	6	8.57
HEAD ON	2	2.86
LEFT TURN, DIFFERENT ROADWAYS	3	4.29
LEFT TURN, SAME ROADWAY	11	15.71
OTHER NON-COLLISION	2	2.86
PEDESTRIAN	1	1.43
RAN OFF ROAD - LEFT	1	1.43
RAN OFF ROAD - RIGHT	2	2.86
REAR END, SLOW OR STOP	39	55.71
REAR END, TURN	2	2.86
RIGHT TURN, DIFFERENT ROADWAYS	1	1.43

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	0	0.00
Class B Injuries	7	20.59
Class C Injuries	27	79.41
Total Non-Fatal Injuries	34	100.00
Total Injuries	34	100.00

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	4	5.71
Feb	7	10.00
Mar	5	7.14
Apr	5	7.14
May	4	5.71
Jun	3	4.29
Jul	8	11.43
Aug	7	10.00
Sep	8	11.43
Oct	5	7.14
Nov	10	14.29
Dec	4	5.71

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	12	17.14
Tue	18	25.71
Wed	15	21.43
Thu	5	7.14
Fri	12	17.14
Sat	6	8.57
Sun	2	2.86

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	1	1.43
0200-0259	0	0.00
0300-0359	0	0.00
0400-0459	0	0.00
0500-0559	0	0.00
0600-0659	0	0.00
0700-0759	3	4.29
0800-0859	10	14.29
0900-0959	3	4.29
1000-1059	5	7.14
1100-1159	4	5.71
1200-1259	4	5.71
1300-1359	0	0.00
1400-1459	4	5.71
1500-1559	5	7.14
1600-1659	8	11.43
1700-1759	6	8.57
1800-1859	5	7.14
1900-1959	5	7.14
2000-2059	3	4.29
2100-2159	3	4.29
2200-2259	1	1.43
2300-2359	0	0.00

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	45	11	0	56
Dark	9	4	0	13
Other	1	0	0	1
Total	55	15	0	70

Object Struck Summary

Object Type	Times Struck	Percent of Total
COMMERCIAL SIGN	1	25.00
PEDESTRIAN	2	50.00
TRAFFIC ISLAND CURB OR MEDIAN	1	25.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
COMMERCIAL BUS	1	0.67
LIGHT TRUCK (MINI-VAN, PANEL)	3	2.00
PASSENGER CAR	96	64.00
PEDALCYCLE	1	0.67
PEDESTRIAN	1	0.67
PICKUP	10	6.67
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	1	0.67
SPORT UTILITY	31	20.67
UNKNOWN	1	0.67
VAN	5	3.33

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2015	15	0	3	12
2016	14	0	6	8
2017	17	0	3	14
2018	10	0	4	6
2019	14	0	7	7
2020	0	0	0	0
Total	70	0	23	47

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2015	0	6
2016	0	8
2017	0	3
2018	0	5
2019	0	12
2020	0	0
Total	0	34

Miscellaneous Totals

Year	Property Damage	EPDO Index
2015	\$ 86050	37.20
2016	\$ 77500	58.40
2017	\$ 72550	39.20
2018	\$ 39630	39.60
2019	\$ 107850	65.80
2020	\$ 0	0.00
Total	\$ 383580	240.20

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road &			
				Fixed Object	Angle	Side Swipe	Other
2015	3	0	9	0	2	0	1
2016	4	0	8	1	0	0	1

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Run Off Road &							
Year	Left Turn	Right Turn	Rear End	Fixed Object	Angle	Side Swipe	Other
2017	4	0	10	1	1	0	1
2018	1	1	6	1	1	0	0
2019	2	0	8	0	2	0	2
2020	0	0	0	0	0	0	0
Total	14	1	41	3	6	0	5

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Strip Diagram

Features	Milepost	Crash IDs
SR 1750 SR 1780 ESTES	3.06	105046446 106083593 105956958
	3.07	104518633 104869551 105278687
	3.08	105950723 104355424 104490927 104582812
		104628361 104667241 104687062 104811851
		105064389 105061198 105070133 105214438
		105328703 105364837 105383107 105472750
		105578758 105578503 105769948 105924178
		105947413 105956966 105991720
	3.09	104463607 104868507 106090208 104377944
		104641695 105277831
	3.10	104975615 105319152 104540526 104975618
	3.11	105041349 105118457 105302117 105950720
		105550242
	3.12	
	3.13	
	3.14	
	3.15	
MISTYWOOD SHADOWWOOD	3.16	104420358 104355678
	3.17	
	3.18	
	3.19	
	3.20	
	3.21	
	3.22	105241684 105487456 105775194 104576492
		105170302
	3.23	104441097 105775541 104889699 105223145
		105924170 106091641
PEDESTRIAN CROSSING	3.24	104628338 104654600 104943056 105310142
		105612691
	3.25	
	3.26	
	3.27	
	3.28	
	3.29	
	3.30	104436650
	3.31	
	3.32	
	3.33	
	3.34	104889332 104547035
	3.35	
	3.36	105605075

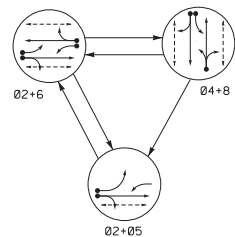
North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Features	Milepost	Crash IDs
MUNICIPAL PINEY MOUNTAIN	3.37	104355920 104355625 105307178 105365499

D

Traffic Signal Plans

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

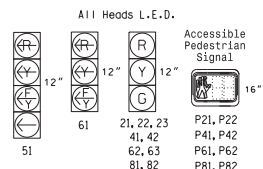
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+6	04+8	02+05	04+05
21, 22, 23	G	G	R	Y
41, 42	R	R	G	R
51	---	---	---	---
61	---	---	---	---
62, 63	R	G	R	Y
81, 82	R	R	G	R
P21, P22	W	W	DW	DRK
P41, P42	DW	DW	W	DRK
P61, P62	DW	DW	W	DRK
P81, P82	DW	DW	W	DRK

F = Flashing Yellow Arrow
W = Walk
DW = Don't Walk
DRK = Dark

SIGNAL FACE I.D.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS				DETECTOR PROGRAMMING			
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURN	PHASE	CALLING	EXTENSION	STRETCH TIME
2A, 2B	6X40	0	2-4-2	Y	2	Y	Y
4A	6X40	16	2-4-2	-	4	Y	Y
4B	6X40	16	2-4-2	-	4	Y	Y
**4C	6X6	0	2-4-2 DIAGONAL	-	4	Y	Y
**4D	6X6	0	2-4-2 DIAGONAL	-	4	Y	Y
5A	6X15	85	2	Y	5	Y	Y
6A	6X60	+5	2-4-2	-	6	Y	Y
6B	6X60	+5	2-4-2	-	6	Y	Y
8A	6X40	16	2-4-2	Y	8	Y	Y
**8B	6X6	0	2-4-2 DIAGONAL	Y	8	Y	Y

**Set sensitivity to appropriate level to detect a bicycle. [See Detail A]

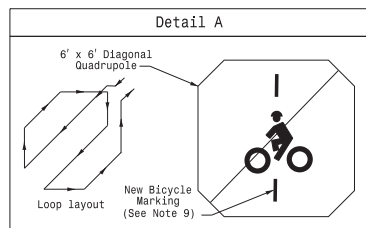
3 Phase Fully Actuated Chapel Hill - Carrboro Signal System

NOTES

- Refer to 'Roadway Standard Drawings NCDOT' dated January 2018 and 'Standard Specifications for Roads and Structures' dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be logged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current Signals and Geometrics Design Manual and submit a Plan of Record to the Signals and Geometrics Section.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features Accessible Pedestrian signals utilizing a percussive tone walk indication and a voice message indication during the Don't Walk phase. Refer to section 4E.11 of the 2009 MUTCD for tone rate and frequency requirements.
- Paint new bicycle markings (as shown on Figure 9C-7 of the 2009 MUTCD) in the center of new loop 8B.
- Refer to C-5179 pavement marking plan for crosswalk and stop bar locations.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

2070 TIMING CHART				
FEATURE	PHASE			
	2	4	5	8
Min Green 1 *	10	7	7	10
Extension 1 *	2.0	1.0	1.0	2.0
Max Green 1 *	40	20	20	40
Yellow Clearance	4.1	4.2	3.0	4.1
Red Clearance	1.1	1.4	1.8	1.1
Walk 1 *	7	7	-	7
Don't Walk 1	6	13	-	8
Seconds Per Activation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	ON	-	ON
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.



ACCESSIBLE PEDESTIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Rapid Ticks)
P22	-	X	Flashing Don't Walk/Don't Walk	-
P41	-	X	Walk	(Rapid Ticks)
P42	-	X	Flashing Don't Walk/Don't Walk	-
P61	-	X	Walk	(Rapid Ticks)
P62	-	X	Flashing Don't Walk/Don't Walk	-
P81	-	X	Walk	(Rapid Ticks)
P82	-	X	Flashing Don't Walk/Don't Walk	-

PROPOSED	EXISTING
○ Traffic Signal Head	○ Traffic Signal Head
○ Modified Signal Head	○ Modified Signal Head
○ Sign	○ Sign
○ Pedestrian Signal Head With Push Button & Sign	○ Pedestrian Signal Head With Push Button & Sign
○ Signal Pole with Guy	○ Signal Pole with Guy
○ Signal Pole with Sidewalk Guy	○ Signal Pole with Sidewalk Guy
○ Inductive Loop Detector	○ Inductive Loop Detector
○ Controller & Cabinet	○ Controller & Cabinet
○ Junction Box	○ Junction Box
○ 2-in Underground Conduit	○ 2-in Underground Conduit
○ Right of Way	○ Right of Way
○ Directional Arrow	○ Directional Arrow
○ Type II Signal Pedestal	○ Type II Signal Pedestal
○ "NO TURN ON RED" Sign (R10-11)	○ "NO TURN ON RED" Sign (R10-11)
○ "To Request Green Wait on Line" Sign (R10-22)	○ "To Request Green Wait on Line" Sign (R10-22)
○ "TURNING TRAFFIC MUST YIELD TO PEDESTRIANS" Sign (R10-15)	○ "TURNING TRAFFIC MUST YIELD TO PEDESTRIANS" Sign (R10-15)

Signal Upgrade

Prepared for the Office of:

SR 1750 (Estes Drive) At Caswell Road

Division 7 Orange County Chapel Hill

PLAN DATE: August 2020 REVIEWED BY: J.L. Lewis

PREPARED BY: M.L. Styles REVIEWED BY: J. H. B.

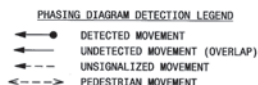
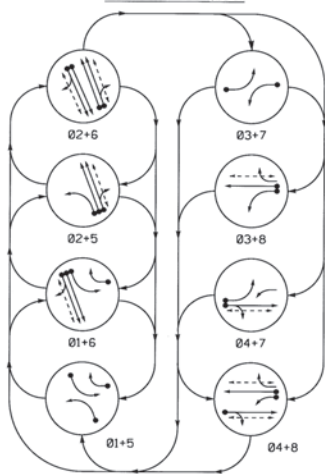
REVISIONS: _____

DATE: 8/31/2020

SIG. INVENTORY NO. 07-0219

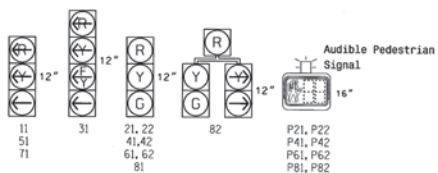
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PHASING DIAGRAM



SIGNAL FACE I.D.

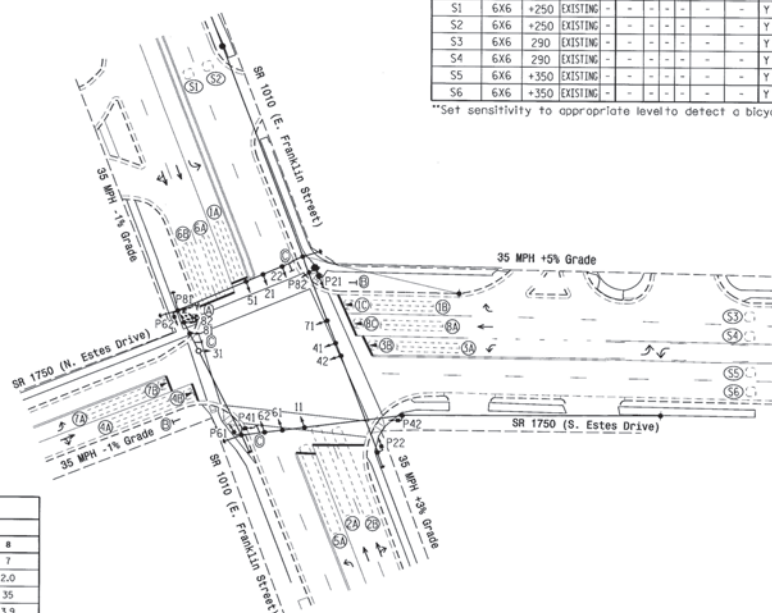
All Heads L.E.D.



SIGNAL FACE	TABLE OF OPERATION							
	01+5	02+5	03+5	04+5	01+6	02+6	03+6	04+6
11	→	→	→	→	→	→	→	→
21, 22	R	R	G	G	R	R	R	Y
31	→	→	→	→	→	→	→	→
41, 42	R	R	R	R	R	R	G	R
51	→	→	→	→	→	→	→	→
61, 62	R	G	R	G	R	R	R	Y
71	→	→	→	→	→	→	→	→
81	R	R	R	R	R	R	G	R
82	→	→	→	→	→	→	→	→
P21, P22	DW	DW	W	W	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	DW	W	DRK

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS						DETECTOR PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	NEW	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW	CAD
1A	6X40	0	2-4-2	-	1	Y	-	-	-	-	-
1B	6X40	16	2-4-2	-	1	Y	-	15	-	-	-
1C	6X6	0	2-4-2	-	1	Y	-	15	-	-	-
2A, 2B	6X60	+10	EXISTING	-	2	Y	-	-	-	-	-
3A	6X40	16	2-4-2	-	3	Y	-	15	-	-	-
3B	6X6	0	2-4-2	-	3	Y	-	15	-	-	-
4A	6X40	16	2-4-2	-	4	Y	-	10	-	-	-
4B	6X6	0	2-4-2	-	4	Y	-	10	-	-	-
5A	6X60	+5	EXISTING	-	5	Y	-	3	-	-	-
6A, 6B	6X40	0	EXISTING	-	6	Y	-	-	-	-	-
7A	6X40	16	2-4-2	-	7	Y	-	-	-	-	-
7B	6X6	0	2-4-2	-	7	Y	-	3	-	-	-
8A	6X40	16	2-4-2	-	8	Y	-	-	-	-	-
8C	6X6	0	2-4-2	-	8	Y	-	-	-	-	-
S1	6X6	+250	EXISTING	-	-	-	-	-	-	-	-
S2	6X6	+250	EXISTING	-	-	-	-	-	-	-	-
S3	6X6	290	EXISTING	-	-	-	-	-	-	-	-
S4	6X6	290	EXISTING	-	-	-	-	-	-	-	-
S5	6X6	+350	EXISTING	-	-	-	-	-	-	-	-
S6	6X6	+350	EXISTING	-	-	-	-	-	-	-	-

**Set sensitivity to appropriate level to detect a bicycle.

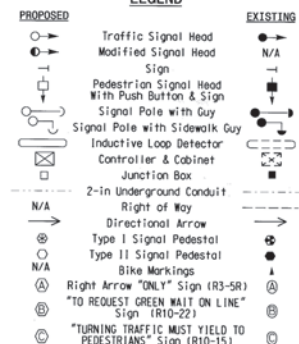


8 Phase Fully Actuated (Chapel Hill-Carrboro Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maintain existing audible pedestrian heads.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND



OASIS 2070L TIMING CHART								
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1"	7	10	7	7	7	10	7	7
Extension 1"	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
Max Green 1"	15	60	30	35	35	60	30	35
Yellow Clearance	3.0	3.7	3.0	3.9	3.0	3.9	3.0	3.9
Red Clearance	2.9	2.0	2.6	2.0	3.2	1.6	2.9	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1"	-	7	-	7	-	7	-	7
Don't Walk 1"	-	23	-	21	-	9	-	18
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	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.

Signal Upgrade

Prepared in the Office of:

SR 1010 (E. Franklin Street) at SR 1750 (Estes Drive)

Division 7 Orange County Chapel Hill

PLAN DATE: February 2014 REVIEWED BY: T. L. Averette

PREPARED BY: T. L. Averette REVIEWED BY:

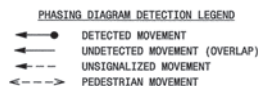
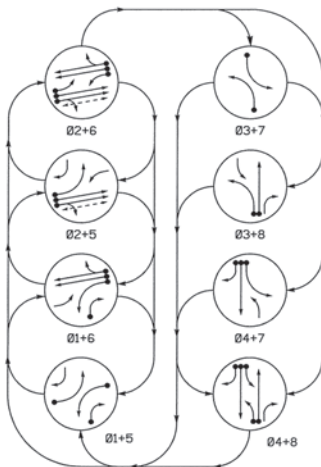
SCALE: 0 40 1"=40'

SIGNATURE: DATE: 1/5/14

SEAL: J. L. MEYER

SIG. PREPARED NO. 07-0527

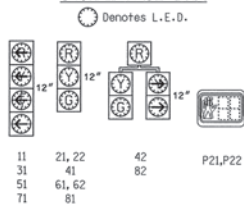
PHASING DIAGRAM



SIGNAL FACE	PHASE							
	01	02	03	04	05	06	07	08
11	---	---	---	---	---	---	---	---
21, 22	R	R	G	G	R	R	R	Y
31	---	---	---	---	---	---	---	---
41	R	R	R	R	R	R	G	R
42	---	---	---	---	---	---	---	---
51	---	---	---	---	---	---	---	---
61, 62	R	G	R	G	R	R	R	Y
71	---	---	---	---	---	---	---	---
81	R	R	R	R	R	R	G	R
82	---	---	---	---	---	---	---	---
P21, P22	DW	DW	W	W	DW	DW	DW	DRX

Flashing Yellow Arrow
W - Walk
DW - Don't Walk
DRX - Dark

SIGNAL FACE I.D.



STANDARD SIGNAL FACE CLEARANCES FOR 4 SECTION LEFT TURN SIGNAL

	TO			
	1	2	1	2
FROM	---	---	---	---
TO	---	---	---	---

Flashing Yellow Arrow

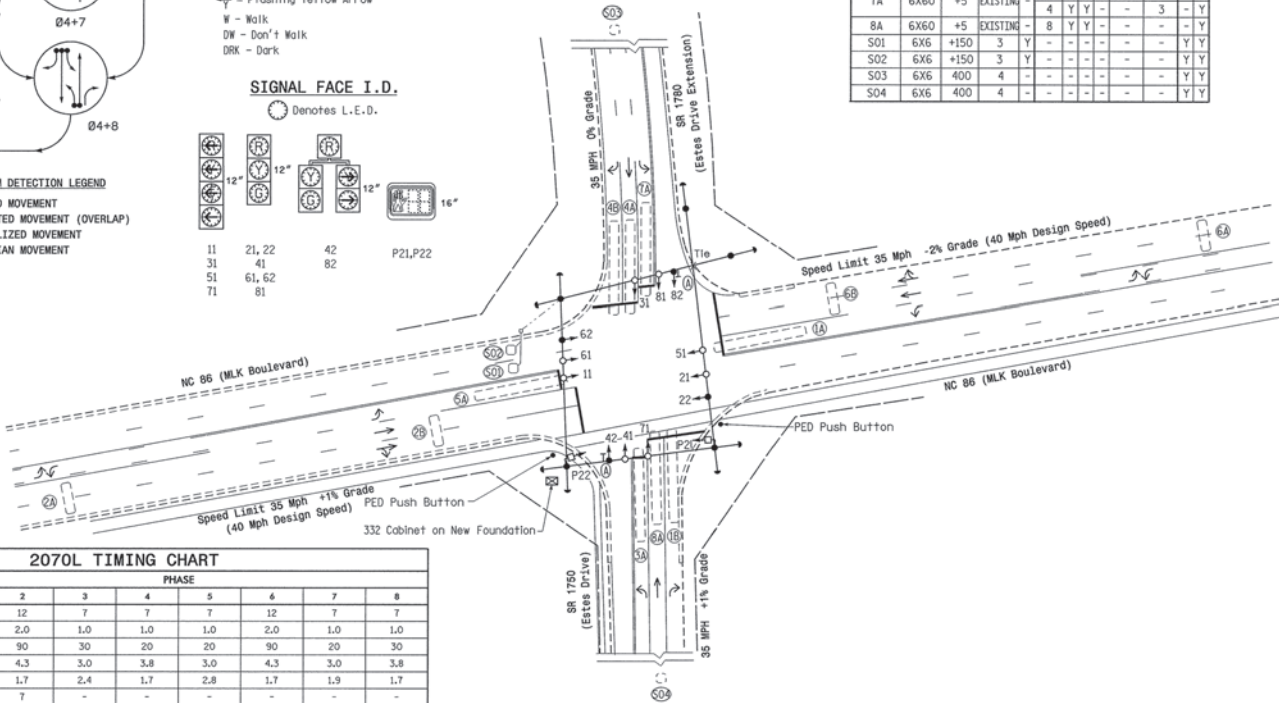
2070L LOOP & DETECTOR INSTALLATION

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING			
				NEW LOOP	PHASE	CALLING EXTENSION	STRETCH TIME
1A	6X60	+5	EXISTING	-	1 Y Y	-	15 - Y
1B	6X60	+5	EXISTING	-	1 Y Y	-	15 - Y
2A	6X20	330	EXISTING	-	2 Y Y	-	3.1 - Y
2B	6X20	70	EXISTING	-	2 Y Y	-	- Y
3A	6X60	+5	EXISTING	-	3 Y Y	-	15 - Y
4A, 4B	6X60	+5	EXISTING	-	4 Y Y	-	- Y
5A	6X60	+5	EXISTING	-	5 Y Y	-	15 - Y
6A	6X20	330	EXISTING	-	6 Y Y	-	3.1 - Y
6B	6X20	70	EXISTING	-	6 Y Y	-	- Y
7A	6X60	+5	EXISTING	-	7 Y Y	-	15 - Y
8A	6X60	+5	EXISTING	-	8 Y Y	-	- Y
S01	6X6	+150	3 Y	-	-	-	- Y Y
S02	6X6	+150	3 Y	-	-	-	- Y Y
S03	6X6	400	4	-	-	-	- Y Y
S04	6X6	400	4	-	-	-	- Y Y

8 Phase Fully Actuated Chapel Hill - Carrboro Signal System

NOTES

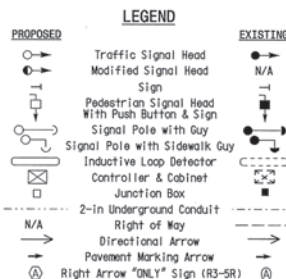
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 or phase 5 may be lagged.
- Phase 3 or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current Signals and Geometrics Design Manual and submit a Plan of Record to the Signals and Geometrics Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Reposition existing signal heads numbered 22, 42, 62 and 82.



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	2.0	1.0	1.0	1.0	2.0	1.0	1.0
Max Green 1 *	20	90	30	20	20	90	20	30
Yellow Clearance	3.0	4.3	3.0	3.8	3.0	4.3	3.0	3.8
Red Clearance	2.8	1.7	2.4	1.7	2.8	1.7	1.9	1.7
Walk 1 *	-	7	-	-	-	-	-	-
Don't Walk 1	-	21	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
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 4 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



Signal Upgrade

Prepared in the Office of
Traffic Engineering

NC 86 (MLK Boulevard)
At
SR 1780 (Estes Drive Extension)
Division 7 Orange County Chapel Hill

PLAN DATE: July 2008
PREPARED BY: K. Waldonado
REVIEWED BY: W. Mahboob

720 N. Greenfield Place, Greensboro, NC 27409
SCALE: 1"=40'

SEAL
NORTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
JASON R. CALDWELL
29904

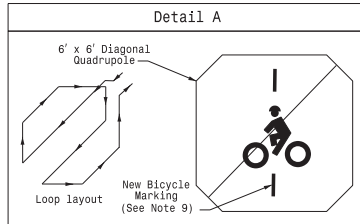
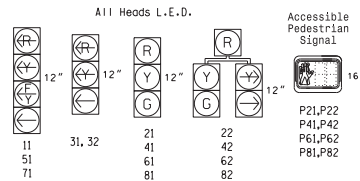
SIG. INVENTORY NO. 49-0532

2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS										DETECTOR PROGRAMMING									
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURN	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	LOOP	NEW LOOP	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	LOOP	NEW LOOP	PHASE	CALLING
1A	6X40	16	2-4-2	Y	1	Y	Y	-	15*	-	Y	1	Y	Y	-	15*	-	Y	1
**1B	6X6	0	2-4-2 DIAGONAL	Y	6*	Y	Y	-	-	-	Y	6*	Y	Y	-	-	-	Y	6*
1C	6X40	0	2-4-2	Y	1	Y	Y	-	15	-	Y	1	Y	Y	-	15	-	Y	1
2A, 2B	6X6	250	4	Y	2	Y	Y	-	1.3	-	Y	2	Y	Y	-	1.3	-	Y	2
2C, 2D	6X6	80	3	Y	2	Y	Y	-	-	-	Y	2	Y	Y	-	-	-	Y	2
3A	6X40	0	2-4-2	Y	3	Y	Y	-	3	-	Y	3	Y	Y	-	3	-	Y	3
3B	6X40	0	2-4-2	Y	3	Y	Y	-	3	-	Y	3	Y	Y	-	3	-	Y	3
**3C	6X6	+12	2-4-2 DIAGONAL	Y	3	Y	Y	-	-	-	Y	3	Y	Y	-	-	-	Y	3
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	Y	4	Y	Y	-	-	-	Y	4
**4B	6X6	+10	2-4-2 DIAGONAL	Y	4	Y	Y	-	-	-	Y	4	Y	Y	-	-	-	Y	4
5A	6X40	16	2-4-2	Y	5	Y	Y	-	15*	-	Y	5	Y	Y	-	15*	-	Y	5
**5B	6X6	0	2-4-2 DIAGONAL	Y	5	Y	Y	-	-	-	Y	5	Y	Y	-	-	-	Y	5
5C	6X40	0	2-4-2	Y	5	Y	Y	-	15	-	Y	5	Y	Y	-	15	-	Y	5
6A, 6B	6X6	250	6	Y	6	Y	Y	-	1.3	-	Y	6	Y	Y	-	1.3	-	Y	6
6C, 6D	6X6	80	5	Y	6	Y	Y	-	-	-	Y	6	Y	Y	-	-	-	Y	6
7A	6X40	16	2-4-2	Y	7	Y	Y	-	15*	-	Y	7	Y	Y	-	15*	-	Y	7
**7B	6X6	0	2-4-2 DIAGONAL	Y	7	Y	Y	-	3	-	Y	7	Y	Y	-	3	-	Y	7
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	Y	8	Y	Y	-	-	-	Y	8
**8B	6X6	+12	2-4-2 DIAGONAL	Y	8	Y	Y	-	-	-	Y	8	Y	Y	-	-	-	Y	8
S01	6X6	+150	4	Y	-	-	-	-	-	-	Y	-	-	-	-	-	-	Y	-
S02	6X6	+150	4	Y	-	-	-	-	-	-	Y	-	-	-	-	-	-	Y	-
S03	6X6	400	6	Y	-	-	-	-	-	-	Y	-	-	-	-	-	-	Y	-
S04	6X6	400	6	Y	-	-	-	-	-	-	Y	-	-	-	-	-	-	Y	-

* Disable delay during alternate phasing operation.
Disable phase call during Alternate Phasing operation.
** Set sensitivity to appropriate level to detect a bicycle. (See "Detail A")

SIGNAL FACE I.D.



2070 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 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	20	20	90	20	30
Yellow Clearance	3.0	4.3	3.0	3.8	3.0	4.3	3.0	3.8
Red Clearance	3.3	2.2	3.2	2.7	3.3	2.2	3.3	2.7
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	19	-	22	-	20	-	22
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
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.

8 Phase
Fully Actuated
Chapel Hill - Carrboro Signal System

PROJECT REFERENCE NO.	SHEET NO.
C-5179	Sig.3.0

NOTES

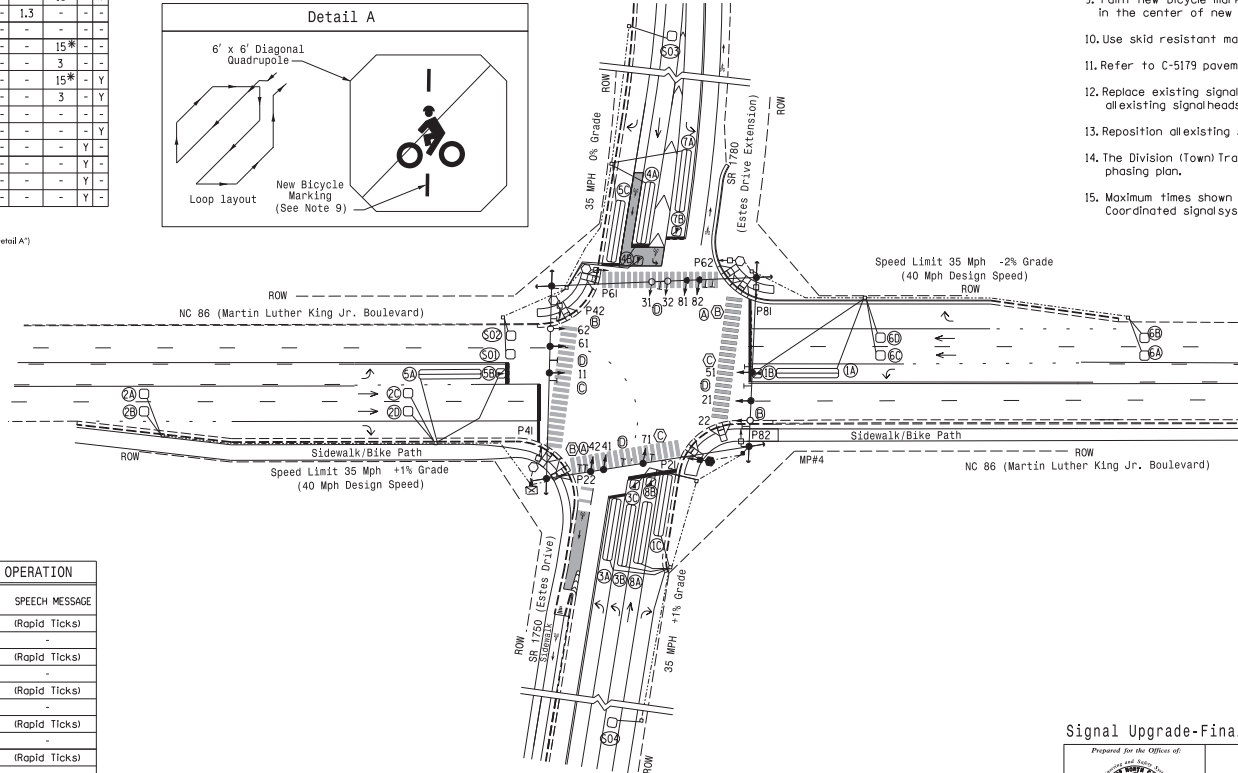
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features Accessible Pedestrian signals utilizing a percussive tone walk indication and a voice message indication during the Don't Walk phase. Refer to section 4E.11 of the 2009 MUTCD for tone rate and frequency requirements.
- Paint new bicycle markings (as shown on Figure 9C-7 of the 2009 MUTCD) in the center of new loops 1B, 3C, 4B, 5B, 7B, and 8B.
- Use skid resistant materials for all new markings.
- Refer to C-5179 pavement marking plan for crosswalk and stop bar locations.
- Replace existing signal heads 22 and 62 with new 5-section heads, reposition all existing signal heads.
- Reposition all existing signs.
- The Division (Town) Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED	EXISTING

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	INTERVAL	SPEED MESSAGE
P21	Walk (Rapid Ticks)	Walk (Rapid Ticks)
P22	Flashing Don't Walk/Don't Walk	Flashing Don't Walk/Don't Walk
P41	Walk (Rapid Ticks)	Walk (Rapid Ticks)
P42	Flashing Don't Walk/Don't Walk	Flashing Don't Walk/Don't Walk
P61	Walk (Rapid Ticks)	Walk (Rapid Ticks)
P62	Flashing Don't Walk/Don't Walk	Flashing Don't Walk/Don't Walk
P81	Walk (Rapid Ticks)	Walk (Rapid Ticks)
P82	Flashing Don't Walk/Don't Walk	Flashing Don't Walk/Don't Walk



Signal Upgrade-Final Design (Sheet 1 of 2)

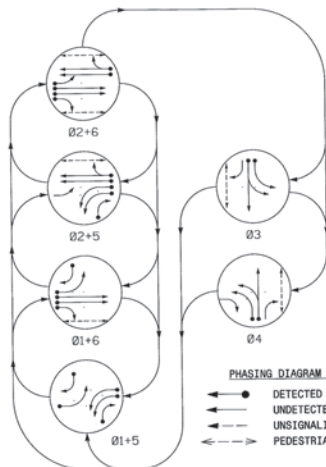
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Office of: Seal of the State of North Carolina	NC 86 (MLK Boulevard) At SR 1750 (Estes Drive)/ SR 1780 (Estes Drive Extension) Division 7 Orange County Chapel Hill	Seal of the State of North Carolina Seal of the State of North Carolina
PLAN DATE: August 2020	REVIEWED BY: J.L. Lewis	Seal of the State of North Carolina Seal of the State of North Carolina
PREPARED BY: M.L. Styles	REVIEWED BY: J.L. Lewis	Seal of the State of North Carolina Seal of the State of North Carolina
SCALE: 1"=40'	DATE: 8/31/2020	Seal of the State of North Carolina Seal of the State of North Carolina
SIG. INVENTORY NO. 07-0532		Seal of the State of North Carolina Seal of the State of North Carolina



VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-433-4328

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

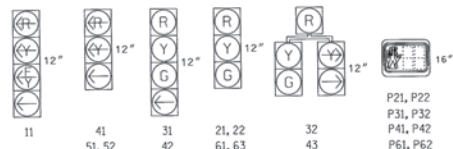
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE							
	01+5	02+5	02+6	03	04	05	06	07
11								
21, 22	R	R	G	R	R	R	R	Y
31	R	R	R	R	R	R	R	R
32	R	R	R	R	R	R	R	R
41	R	R	R	R	R	R	R	R
42	R	R	R	R	R	R	R	R
43	R	R	R	R	R	R	R	R
51, 52	R	R	R	R	R	R	R	R
61, 63	R	R	R	R	R	R	R	R
62	R	R	R	R	R	R	R	R
P21, P22	DW	DW	W	DW	DW	DW	DW	DK
P31, P32	DW	DW	DW	DW	W	DW	DK	
P41, P42	DW	DW	DW	DW	DW	W	DK	
P61, P62	DW	W	DW	W	DW	DW	DK	

41 - FLASHING YELLOW ARROW
W-Walk
DW-Don't Walk
DK-Dark

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	STRETCH TIME	DELAY TIME
1A	6X40	0	2-4-2	Y	1	Y	Y	-	15
1B	6X40	0	2-4-2	Y	1	Y	Y	-	15
2A, 2B	6X6	300	EXISTING	-	2	Y	Y	-	3
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-
4A	6X60	+23	2-4-2	-	4	Y	Y	-	-
4B	6X60	+16	2-4-2	-	4	Y	Y	-	-
5A	6X60	0	2-4-2	-	5	Y	Y	-	3
5B	6X60	10	2-4-2	-	5	Y	Y	-	-
5C	6X60	+25	2-4-2	-	5	Y	Y	-	15
6A, 6B, 6C	6X6	300	EXISTING	-	6	Y	Y	-	-
S01	6X6	+175	3	-	-	-	-	-	Y
S02	6X6	+175	3	-	-	-	-	-	Y
S03	6X6	300	4	-	-	-	-	-	Y
S04	6X6	300	4	-	-	-	-	-	Y

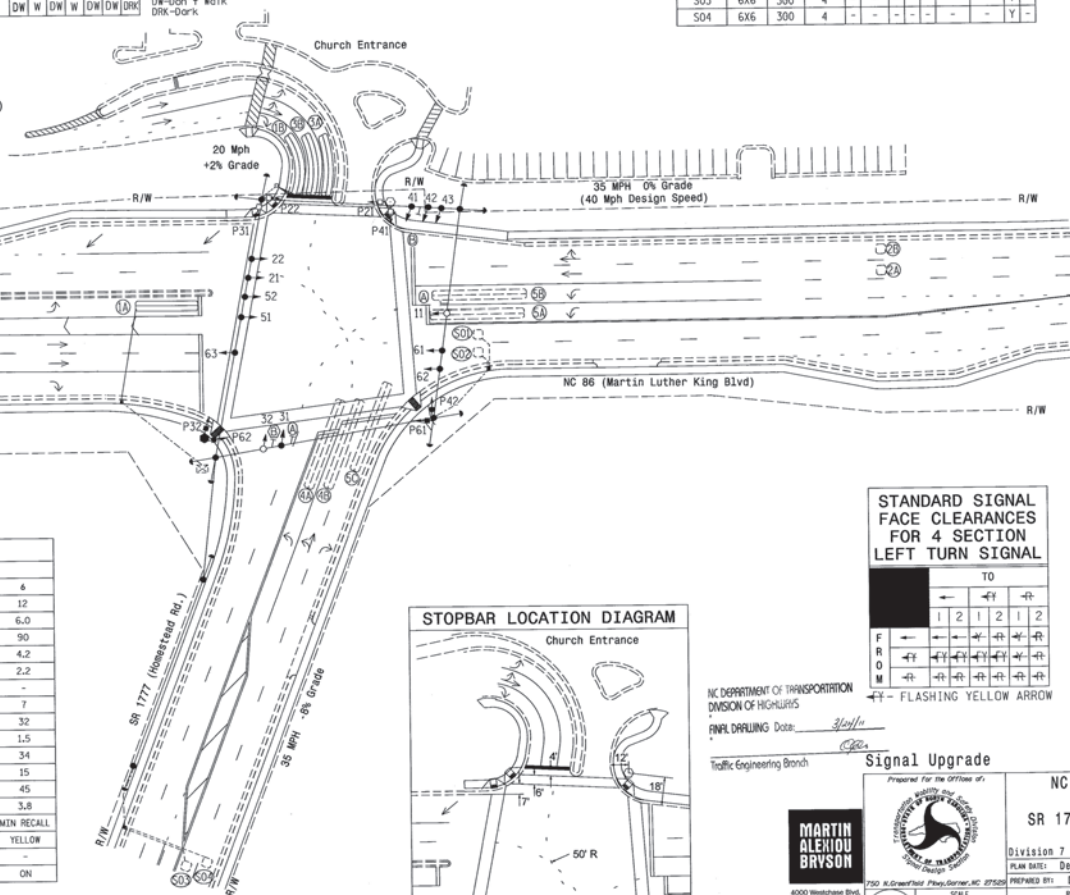
6 Phase Fully Actuated (Chapel Hill-Carrboro Signal System)

NOTES

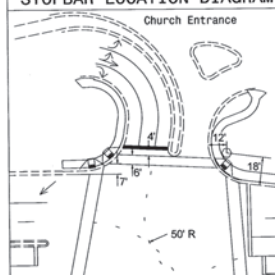
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: <http://www.ncdot.org/doh/preconstruct/traffic/itss/>.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Reposition existing signal head 31 and sign A as shown.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- In the event of loop replacement, refer to the current ITS and Signals Unit Design Manual and submit a Plan of Record to the Signals Section.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

OASIS 2070L TIMING CHART						
FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1"	7	12	7	7	7	12
Extension 1"	2.0	6.0	2.0	1.0	1.0	6.0
Max Green 1"	20	90	15	20	20	90
Yellow Clearance	3.0	4.2	3.0	4.5	3.0	4.2
Red Clearance	3.4	1.8	3.9	2.6	3.3	2.2
Red Revert	-	-	-	-	-	-
Walk 1"	-	7	7	7	-	7
Don't Walk 1"	-	15	36	27	-	32
Seconds Per Actuation *	-	1.5	-	-	-	1.5
Max Variable Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	45	-	-	-	45
Minimum Gap	-	3.8	-	-	-	3.8
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	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.



STOPBAR LOCATION DIAGRAM



STANDARD SIGNAL FACE CLEARANCES FOR 4 SECTION LEFT TURN SIGNAL

TO		1	2	1	2
F	R	+	+	+	+
R	O	+	+	+	+
O	M	+	+	+	+

41 - FLASHING YELLOW ARROW

LEGEND

- | PROPOSED | EXISTING |
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NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

DATE: 3/2/11

PREPARED BY: D.J. Darity

PROJECT NO.: 2010075

REVISIONS:

INT: DATE

SCALE: 1"=40'

MARTIN ALEXANDER BRYSON

4000 Westchase Blvd.
Suite 530
Raleigh, NC 27607
Tel: 919.486.0300
Fax: 919.486.0309
NC License No. C-34589

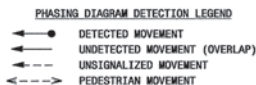
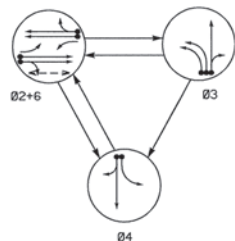


NC 86 (MLK Boulevard)
at
SR 1777 (Homestead Road) /
Church Entrance
Division 7 Orange County
PLAN DATE: Dec 2010
PREPARED BY: D.J. Darity
PROJECT NO.: 2010075



DATE: 3/16/2011
SHEET NO.: 07-1019

PHASING DIAGRAM

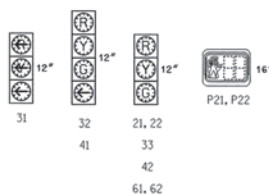


SIGNAL FACE	PHASE			
	Ø2+6	Ø3	Ø4	Ø1
21,22	G R R Y			
31	← → ← →			
32	R G R R			
33	R G R R			
41	R R G R			
42	R R G R			
61, 62	G R R Y			
P21, P22	W DW DW DRK			

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

Denotes L.E.D.



(Re-Wire Heads 21, 22, 61, & 62)

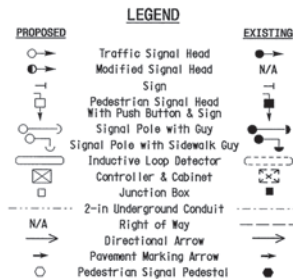
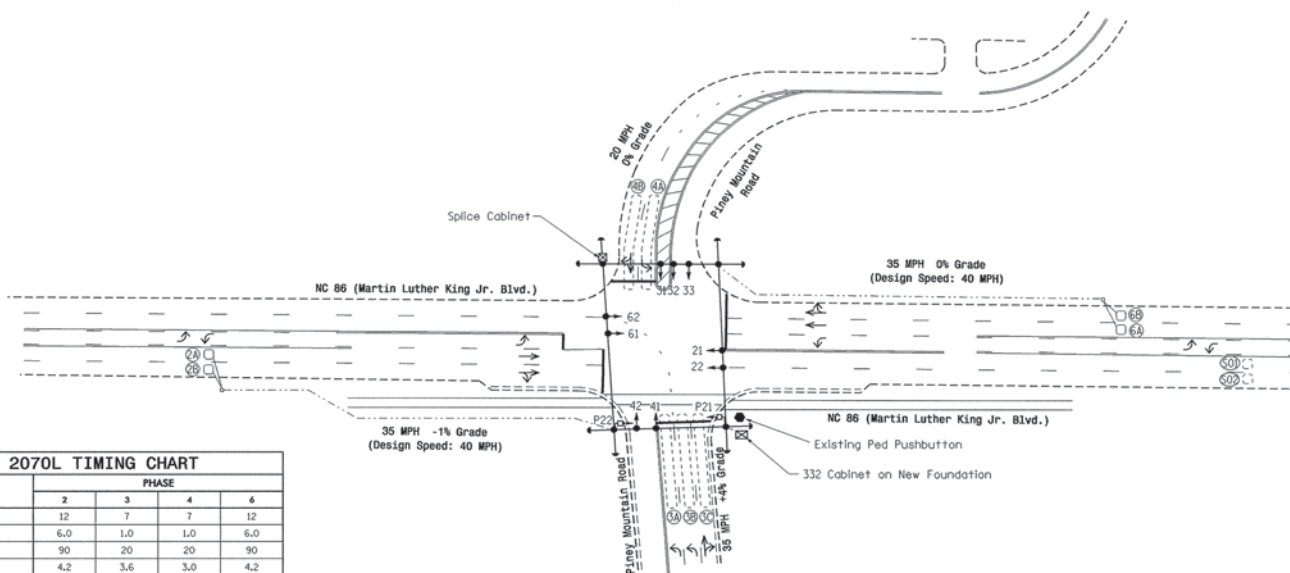
2070L LOOP & DETECTOR INSTALLATION									
INDUCTIVE LOOPS					DETECTOR PROGRAMMING				
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURN	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP
2A	6X6	250	4	Y	2	Y	-	-	Y
2B	6X6	250	4	Y	2	Y	-	-	Y
3A, 3B, 3C	6X60	+5	Existing	-	3	Y	-	-	Y
4A, 4B	6X60	+5	Existing	-	4	Y	-	-	Y
6A	6X6	250	4	Y	6	Y	-	-	Y
6B	6X6	250	4	Y	6	Y	-	-	Y
S01	6X6	+410/-	4	-	-	-	-	-	Y
S02	6X6	+410/-	4	-	-	-	-	-	Y

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 3 or phase 4 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current Signals and Geometrics Design Manual and submit a Plan of Record to the Signals and Geometrics Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.

2070L TIMING CHART				
FEATURE	PHASE			
	2	3	4	6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	1.0	1.0	6.0
Max Green 1 *	90	20	20	90
Yellow Clearance	4.2	3.6	3.0	4.2
Red Clearance	1.6	2.3	2.6	1.3
Walk 1 *	7	-	-	-
Don't Walk 1	15	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	29	-	-	29
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
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.



Signal Upgrade

	NC 86 (Martin Luther King, Jr. Blvd.) at Piney Mountain Road			
	Division 07 Orange County Chapel Hill			
	PLAN DATE: July 2008 PREPARED BY: Wabhooba/Carter REVISIONS:	REVIEWED BY: W. Wabhooba REVIEWED BY:		DATE:
	SCALE: 1"=40' 0 40			

E

Intersection Capacity Analysis

[Synchro Reports](#)

[SimTraffic Reports](#)

[SIDRA Reports](#)

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Existing (2020) AM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	4	98	79	555	1055	118
Future Volume (vph)	4	98	79	555	1055	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.985	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1509	1719	3343	3426	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1509	1719	3343	3426	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	8		2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	7%	5%	8%	4%	2%
Adj. Flow (vph)	4	109	88	617	1172	131
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	109	88	617	1303	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.7%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Existing (2020) AM
12/23/2020

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	98	79	555	1055	118
Future Vol, veh/h	4	98	79	555	1055	118
Conflicting Peds, #/hr	8	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	7	5	8	4	2
Mvmt Flow	4	109	88	617	1172	131

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1733	654	1305
Stage 1	1240	-	-
Stage 2	493	-	-
Critical Hdwy	6.84	7.04	4.2
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.37	2.25
Pot Cap-1 Maneuver	79	398	511
Stage 1	236	-	-
Stage 2	579	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	65	397	510
Mov Cap-2 Maneuver	154	-	-
Stage 1	195	-	-
Stage 2	578	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	510	-	154	397	-	-
HCM Lane V/C Ratio	0.172	-	0.029	0.274	-	-
HCM Control Delay (s)	13.5	-	29.1	17.5	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.6	-	0.1	1.1	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	297	80	158	140	222	34	414	113	350	938	219
Future Volume (vph)	262	297	80	158	140	222	34	414	113	350	938	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	150		200	150		0	225		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								0.99		1.00		
Frt			0.850			0.850		0.968			0.972	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1744	1818	1545	1761	3227	0	1787	3414	0
Flt Permitted	0.479			0.168			0.093			0.272		
Satd. Flow (perm)	892	1863	1583	308	1818	1545	172	3227	0	511	3414	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			1571			1063			1514	
Travel Time (s)		24.4			30.6			20.7			29.5	
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	4%	4%	2%	8%	4%	2%	4%	3%
Adj. Flow (vph)	291	330	89	176	156	247	38	460	126	389	1042	243
Shared Lane Traffic (%)												
Lane Group Flow (vph)	291	330	89	176	156	247	38	586	0	389	1285	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	8		4	4		8	6			2		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0		12.8	18.0	
Total Split (s)	27.0	35.0	17.0	23.0	31.0	31.0	17.0	41.0		31.0	55.0	
Total Split (%)	20.8%	26.9%	13.1%	17.7%	23.8%	23.8%	13.1%	31.5%		23.8%	42.3%	
Maximum Green (s)	22.1	29.5	11.2	17.6	25.5	25.2	11.2	35.0		25.2	49.0	
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3		3.0	4.3	
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7		2.8	1.7	
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0		-0.8	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0		1.0	2.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	39.5	26.2	39.0	39.5	20.4	52.8	70.5	38.1		70.5	62.7	
Actuated g/C Ratio	0.30	0.20	0.30	0.30	0.16	0.41	0.54	0.29		0.54	0.48	

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) AM
12/23/2020

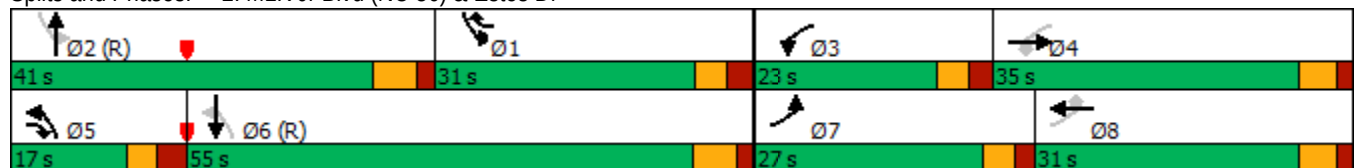
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.73	0.88	0.19	0.73	0.55	0.39	0.20	0.62		0.65	0.78	
Control Delay	43.9	74.1	33.6	48.2	57.1	16.4	16.7	44.1		32.2	28.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.9	74.1	33.6	48.2	57.1	16.4	16.7	44.1		32.2	28.7	
LOS	D	E	C	D	E	B	B	D		C	C	
Approach Delay		56.6			37.0			42.4			29.5	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	189	269	55	106	122	78	14	235		108	306	
Queue Length 95th (ft)	251	#377	96	152	186	124	34	296		#291	#559	
Internal Link Dist (ft)		1171			1491			983			1434	
Turn Bay Length (ft)	225		350	150		200	150			225		
Base Capacity (vph)	434	432	526	300	363	627	245	964		594	1646	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.67	0.76	0.17	0.59	0.43	0.39	0.16	0.61		0.65	0.78	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 84 (65%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 38.4
Intersection Capacity Utilization 83.8%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: D
ICU Level of Service E

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	262	297	80	158	140	222	34	414	113	350	938	219
Future Volume (veh/h)	262	297	80	158	140	222	34	414	113	350	938	219
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1850	1835	1835	1864	1776	1776	1949	1919	1919
Adj Flow Rate, veh/h	291	330	89	176	156	247	38	460	126	389	1042	243
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	3	4	4	2	8	8	2	4	4
Cap, veh/h	382	364	386	247	253	753	355	547	149	725	1491	346
Arrive On Green	0.15	0.19	0.20	0.10	0.14	0.14	0.05	0.21	0.20	0.69	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1762	1835	1555	1776	2617	711	1856	2935	682
Grp Volume(v), veh/h	291	330	89	176	156	247	38	295	291	389	646	639
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1762	1835	1555	1776	1687	1641	1856	1823	1794
Q Serve(g_s), s	18.1	22.4	5.9	10.2	10.4	4.6	1.3	21.8	22.2	4.1	0.0	0.0
Cycle Q Clear(g_c), s	18.1	22.4	5.9	10.2	10.4	4.6	1.3	21.8	22.2	4.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	1.00		0.38
Lane Grp Cap(c), veh/h	382	364	386	247	253	753	355	352	343	725	926	911
V/C Ratio(X)	0.76	0.91	0.23	0.71	0.62	0.33	0.11	0.84	0.85	0.54	0.70	0.70
Avail Cap(c_a), veh/h	409	432	443	320	367	849	436	467	454	725	926	911
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	40.1	51.2	39.4	38.6	52.8	7.2	13.3	49.3	49.7	13.3	0.0	0.0
Incr Delay (d2), s/veh	6.7	18.8	0.1	3.0	0.9	0.1	0.0	20.6	22.1	0.3	3.5	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	12.3	2.3	4.6	4.8	1.9	0.5	11.1	11.1	4.0	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	70.0	39.5	41.6	53.7	7.3	13.3	69.9	71.8	13.7	3.5	3.7
LnGrp LOS	D	E	D	D	D	A	B	E	E	B	A	A
Approach Vol, veh/h		710			579			624			1674	
Approach Delay, s/veh		56.6			30.2			67.3			5.9	
Approach LOS		E			C			E			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	49.9	32.2	17.6	30.3	11.0	71.0	25.0	22.9				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 25	* 35	17.6	29.5	* 11	* 49	* 22	25.5				
Max Q Clear Time (g_c+I1), s	6.1	24.2	12.2	24.4	3.3	2.0	20.1	12.4				
Green Ext Time (p_c), s	0.2	1.8	0.0	0.4	0.0	6.8	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Existing (2020) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	2	0	7	160	1	38	14	831	63	20	1370	2
Future Volume (vph)	2	0	7	160	1	38	14	831	63	20	1370	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99		1.00				1.00		1.00		
Frt		0.850			0.853			0.989				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1234	0	3332	1542	0	1499	3409	0	1641	3505	0
Flt Permitted	0.950			0.950			0.137			0.268		
Satd. Flow (perm)	1770	1234	0	3320	1542	0	216	3409	0	463	3505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1514			2618	
Travel Time (s)		18.9			12.9			29.5			51.0	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	29%	3%	2%	3%	21%	5%	6%	10%	3%	2%
Adj. Flow (vph)	2	0	8	178	1	42	16	923	70	22	1522	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	8	0	178	43	0	16	993	0	22	1524	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	20.0	20.0		24.0	24.0		86.0	86.0		86.0	86.0	
Total Split (%)	15.4%	15.4%		18.5%	18.5%		66.2%	66.2%		66.2%	66.2%	
Maximum Green (s)	14.4	14.4		18.1	18.1		80.2	80.2		80.5	80.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Existing (2020) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.6	7.6		11.3	11.3		103.7	103.7		103.7	103.7	
Actuated g/C Ratio	0.06	0.06		0.09	0.09		0.80	0.80		0.80	0.80	
v/c Ratio	0.02	0.11		0.62	0.32		0.09	0.37		0.06	0.55	
Control Delay	58.0	61.7		66.3	61.2		5.2	3.9		2.5	3.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.0	61.7		66.3	61.2		5.2	3.9		2.5	3.0	
LOS	E	E		E	E		A	A		A	A	
Approach Delay		61.0			65.3			3.9			3.0	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	7		75	35		1	33		3	95	
Queue Length 95th (ft)	11	24		112	72		m6	188		m2	77	
Internal Link Dist (ft)		474			583			1434			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	204	142		486	225		172	2718		369	2794	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.06		0.37	0.19		0.09	0.37		0.06	0.55	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 80 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 8.4
Intersection Capacity Utilization 57.5%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
ICU Level of Service B

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

					
Ø2 (R)	Ø3	Ø4	Ø5 (R)	Ø6 (R)	
86 s	24 s	20 s	86 s		

HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	6	246	2	0	1	106	787	2	9	1141	121
Future Volume (vph)	220	6	246	2	0	1	106	787	2	9	1141	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00		1.00		0.98
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.955		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	1682	1695	1647	1664	1664	1567	3242	3467	0	1770	3505	1482
Flt Permitted	0.950	0.955		0.950	0.950		0.950			0.288		
Satd. Flow (perm)	1680	1692	1621	1646	1646	1546	3238	3467	0	536	3505	1457
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	1		4	4		1	5		1	1		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	8%	4%	50%	2%	3%	9%
Adj. Flow (vph)	244	7	273	2	0	1	118	874	2	10	1268	134
Shared Lane Traffic (%)	49%			50%								
Lane Group Flow (vph)	124	127	273	1	1	1	118	876	0	10	1268	134
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	28.0	28.0	28.0	17.0	17.0	17.0	28.0	68.0		17.0	57.0	28.0
Total Split (%)	21.5%	21.5%	21.5%	13.1%	13.1%	13.1%	21.5%	52.3%		13.1%	43.8%	21.5%
Maximum Green (s)	20.9	20.9	21.7	10.1	10.1	10.6	21.7	62.0		10.6	50.6	20.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	15.2	15.2	36.1	8.9	8.9	10.2	20.9	96.6		100.0	76.1	91.3
Actuated g/C Ratio	0.12	0.12	0.28	0.07	0.07	0.08	0.16	0.74		0.77	0.59	0.70
v/c Ratio	0.63	0.64	0.60	0.01	0.01	0.01	0.23	0.34		0.02	0.62	0.13
Control Delay	68.3	68.8	38.9	57.0	57.0	40.0	48.7	5.2		5.6	21.4	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.3	68.8	38.9	57.0	57.0	40.0	48.7	5.2		5.6	21.4	6.4
LOS	E	E	D	E	E	D	D	A		A	C	A
Approach Delay		53.1			51.3			10.4			19.9	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	106	109	183	1	1	1	51	116		1	343	28
Queue Length 95th (ft)	169	173	206	7	7	5	77	237		9	582	70
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	297	299	474	153	153	165	573	2576		532	2051	1077
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.42	0.42	0.58	0.01	0.01	0.01	0.21	0.34		0.02	0.62	0.12

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 39 (30%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 22.6

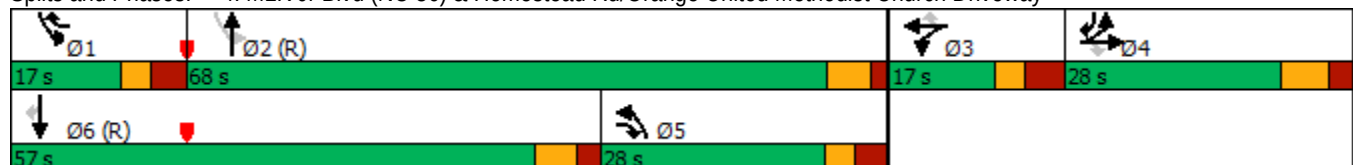
Intersection LOS: C

Intersection Capacity Utilization 66.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	737	508	6	13	10
Future Volume (vph)	10	737	508	6	13	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998		0.941	
Flt Protected		0.999			0.973	
Satd. Flow (prot)	0	1842	1832	0	1690	0
Flt Permitted		0.999			0.973	
Satd. Flow (perm)	0	1842	1832	0	1690	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1571	840		813	
Travel Time (s)		30.6	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	2%	2%	10%
Adj. Flow (vph)	11	819	564	7	14	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	830	571	0	25	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.8%
Analysis Period (min) 15

ICU Level of Service B

Intersection

Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	737	508	6	13	10
Future Vol, veh/h	10	737	508	6	13	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	2	2	10
Mvmt Flow	11	819	564	7	14	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	571	0	0 1409 568
Stage 1	-	-	- 568 -
Stage 2	-	-	- 841 -
Critical Hdwy	4.12	-	- 5.42 5.8
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.39
Pot Cap-1 Maneuver	1002	-	- 226 549
Stage 1	-	-	- 664 -
Stage 2	-	-	- 534 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1002	-	- 221 549
Mov Cap-2 Maneuver	-	-	- 221 -
Stage 1	-	-	- 651 -
Stage 2	-	-	- 534 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1002	-	-	-	299
HCM Lane V/C Ratio	0.011	-	-	-	0.085
HCM Control Delay (s)	8.6	0	-	-	18.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	657	2	1	430	32	8	9	7	43	2	127
Future Volume (vph)	180	657	2	1	430	32	8	9	7	43	2	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			0.98			0.92	
Frt					0.989			0.960			0.852	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1787	1881	0	1770	1804	0	0	1698	0	1814	1467	0
Flt Permitted	0.392			0.326				0.888		0.740		
Satd. Flow (perm)	733	1881	0	607	1804	0	0	1507	0	1413	1467	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	8		2	2		8	21					21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	4%
Adj. Flow (vph)	200	730	2	1	478	36	9	10	8	48	2	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	732	0	1	514	0	0	27	0	48	143	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	16.0	66.0		66.0	50.0		24.0	24.0		24.0	24.0	
Total Split (%)	17.8%	73.3%		73.3%	55.6%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	10.4	60.4		60.4	44.4		19.1	19.1		18.6	18.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	62.3	67.3		67.3	54.1			10.8		12.7	12.7	
Actuated g/C Ratio	0.69	0.75		0.75	0.60			0.12		0.14	0.14	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.33	0.52		0.00	0.47			0.15		0.24	0.69	
Control Delay	5.5	7.0		4.0	12.9			34.5		35.4	53.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	5.5	7.0		4.0	12.9			34.5		35.4	53.3	
LOS	A	A		A	B			C		D	D	
Approach Delay		6.7			12.9			34.5			48.8	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	26	138		0	146			15		25	79	
Queue Length 95th (ft)	59	276		2	282			35		53	131	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	659	1406		453	1084			318		298	309	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.30	0.52		0.00	0.47			0.08		0.16	0.46	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 13.9
Intersection Capacity Utilization 66.8%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) AM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	657	2	1	430	32	8	9	7	43	2	127
Future Volume (veh/h)	180	657	2	1	430	32	8	9	7	43	2	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.96		0.92	0.95		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1841	1841	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	200	730	2	1	478	36	9	10	8	48	2	141
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	4	4	2	2	2	2	2	2
Cap, veh/h	247	1124	3	290	1024	77	73	63	35	252	3	219
Arrive On Green	0.09	0.58	0.57	0.12	0.61	0.60	0.13	0.13	0.13	0.14	0.14	0.13
Sat Flow, veh/h	1856	1942	5	1781	1690	127	152	483	267	1462	23	1595
Grp Volume(v), veh/h	200	0	732	1	0	514	27	0	0	48	0	143
Grp Sat Flow(s),veh/h/ln	1856	0	1948	1781	0	1817	902	0	0	1462	0	1618
Q Serve(g_s), s	5.5	0.0	22.8	0.1	0.0	14.0	0.1	0.0	0.0	0.0	0.0	7.5
Cycle Q Clear(g_c), s	5.5	0.0	22.8	0.1	0.0	14.0	7.6	0.0	0.0	3.4	0.0	7.5
Prop In Lane	1.00		0.00	1.00		0.07	0.33		0.30	1.00		0.99
Lane Grp Cap(c), veh/h	247	0	1127	0	0	1101	173	0	0	252	0	222
V/C Ratio(X)	0.81	0.00	0.65	0.00	0.00	0.47	0.16	0.00	0.00	0.19	0.00	0.65
Avail Cap(c_a), veh/h	307	0	1320	0	0	1101	272	0	0	361	0	342
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.3	0.0	12.8	0.0	0.0	9.8	34.6	0.0	0.0	35.0	0.0	37.0
Incr Delay (d2), s/veh	9.9	0.0	2.9	0.0	0.0	1.4	0.2	0.0	0.0	0.1	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	9.6	0.0	0.0	5.3	0.5	0.0	0.0	1.0	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.2	0.0	15.7	0.0	0.0	11.2	34.8	0.0	0.0	35.1	0.0	38.1
LnGrp LOS	D	A	B	A	A	B	C	A	A	D	A	D
Approach Vol, veh/h		932			515			27			191	
Approach Delay, s/veh		21.0			11.2			34.8			37.4	
Approach LOS		C			B			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	57.1		17.3	13.1	59.5		17.3				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 60	* 60		* 19	10.4	44.4		* 19				
Max Q Clear Time (g_c+I1), s	2.1	24.8		9.5	7.5	16.0		9.6				
Green Ext Time (p_c), s	0.0	3.4		0.3	0.0	2.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	20.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	329	49	103	194	109	41	359	78	91	544	240
Future Volume (vph)	349	329	49	103	194	109	41	359	78	91	544	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00		0.98	0.99	1.00		1.00	0.98	
Frt		0.981				0.850		0.973			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1833	0	1692	1748	1514	1743	3298	0	1711	3303	0
Flt Permitted	0.950			0.229			0.950			0.950		
Satd. Flow (perm)	1764	1833	0	407	1748	1480	1724	3298	0	1708	3303	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	7		3	3		7	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	4%	6%	4%	2%	5%	2%	6%	3%	3%
Adj. Flow (vph)	388	366	54	114	216	121	46	399	87	101	604	267
Shared Lane Traffic (%)												
Lane Group Flow (vph)	388	420	0	114	216	121	46	486	0	101	871	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	35.0	35.0		35.0	35.0	20.0	20.0	40.0		20.0	40.0	
Total Split (%)	26.9%	26.9%		26.9%	26.9%	15.4%	15.4%	30.8%		15.4%	30.8%	
Maximum Green (s)	29.1	29.1		29.4	29.1	14.1	13.8	34.3		14.1	34.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	29.6	40.3		50.7	21.0	33.7	9.1	46.6		12.7	52.9	
Actuated g/C Ratio	0.23	0.31		0.39	0.16	0.26	0.07	0.36		0.10	0.41	

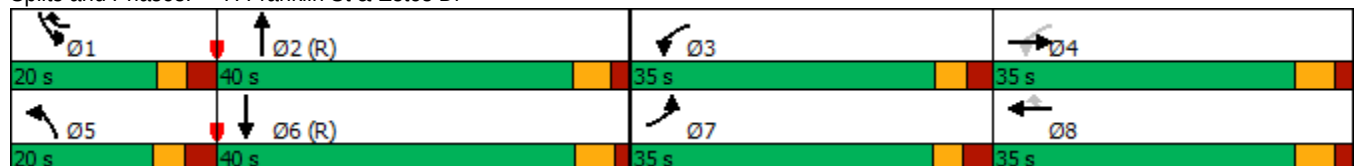
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.96	0.74		0.44	0.77	0.31	0.38	0.41		0.60	0.65	
Control Delay	85.0	48.4		27.1	69.2	35.2	66.5	34.6		70.9	36.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	85.0	48.4		27.1	69.2	35.2	66.5	34.6		70.9	36.1	
LOS	F	D		C	E	D	E	C		E	D	
Approach Delay		66.0			49.5			37.3			39.7	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	324	315		58	176	78	38	162		83	317	
Queue Length 95th (ft)	#521	417		88	250	114	79	243		140	446	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	410	568		470	403	418	201	1183		202	1343	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.95	0.74		0.24	0.54	0.29	0.23	0.41		0.50	0.65	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 124 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 48.5
 Intersection Capacity Utilization 79.3%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	329	49	103	194	109	41	359	78	91	544	240
Future Volume (veh/h)	349	329	49	103	194	109	41	359	78	91	544	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1693	1664	1693	1817	1773	1773	1849	1894	1894
Adj Flow Rate, veh/h	388	366	54	114	216	121	46	399	87	101	604	267
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	4	6	4	2	5	5	6	3	3
Cap, veh/h	420	533	79	276	272	342	91	1031	223	135	962	425
Arrive On Green	0.23	0.33	0.32	0.07	0.16	0.16	0.05	0.38	0.37	0.08	0.40	0.39
Sat Flow, veh/h	1818	1625	240	1613	1664	1417	1731	2748	593	1761	2419	1068
Grp Volume(v), veh/h	388	0	420	114	216	121	46	243	243	101	449	422
Grp Sat Flow(s),veh/h/ln	1818	0	1864	1613	1664	1417	1731	1684	1657	1761	1800	1687
Q Serve(g_s), s	27.1	0.0	25.4	6.0	16.2	9.2	3.4	13.7	14.0	7.3	26.1	26.1
Cycle Q Clear(g_c), s	27.1	0.0	25.4	6.0	16.2	9.2	3.4	13.7	14.0	7.3	26.1	26.1
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.36	1.00		0.63
Lane Grp Cap(c), veh/h	420	0	611	276	272	342	91	632	622	135	716	671
V/C Ratio(X)	0.92	0.00	0.69	0.41	0.79	0.35	0.50	0.38	0.39	0.75	0.63	0.63
Avail Cap(c_a), veh/h	420	0	611	541	384	437	200	632	622	203	716	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	0.0	38.0	28.7	52.3	41.0	59.9	29.7	29.8	58.8	31.4	31.6
Incr Delay (d2), s/veh	25.8	0.0	2.7	0.4	4.8	0.2	1.6	1.8	1.8	3.0	4.1	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	0.0	11.9	2.3	7.1	3.2	1.5	5.8	5.9	3.4	12.0	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.7	0.0	40.7	29.1	57.1	41.3	61.5	31.4	31.7	61.8	35.6	36.0
LnGrp LOS	E	A	D	C	E	D	E	C	C	E	D	D
Approach Vol, veh/h		808			451			532			972	
Approach Delay, s/veh		57.0			45.8			34.1			38.5	
Approach LOS		E			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	53.8	13.6	47.6	11.9	56.9	35.0	26.2				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 34	29.4	29.1	* 14	* 35	29.1	29.1				
Max Q Clear Time (g_c+I1), s	9.3	16.0	8.0	27.4	5.4	28.1	29.1	18.2				
Green Ext Time (p_c), s	0.0	1.7	0.1	0.3	0.0	2.1	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	44.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Existing (2020) Noon
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	19	61	78	600	565	32
Future Volume (vph)	19	61	78	600	565	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.992	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1719	1538	1752	3438	3445	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1719	1538	1752	3438	3445	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	6					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	3%	5%	4%	3%
Adj. Flow (vph)	21	68	87	667	628	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	68	87	667	664	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.3%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	61	78	600	565	32
Future Vol, veh/h	19	61	78	600	565	32
Conflicting Peds, #/hr	6	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	3	5	4	3
Mvmt Flow	21	68	87	667	628	36

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1160	332	664
Stage 1	646	-	-
Stage 2	514	-	-
Critical Hdwy	6.9	7	4.16
Critical Hdwy Stg 1	5.9	-	-
Critical Hdwy Stg 2	5.9	-	-
Follow-up Hdwy	3.55	3.35	2.23
Pot Cap-1 Maneuver	184	655	914
Stage 1	476	-	-
Stage 2	557	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	167	655	914
Mov Cap-2 Maneuver	296	-	-
Stage 1	431	-	-
Stage 2	557	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	914	-	296	655	-	-
HCM Lane V/C Ratio	0.095	-	0.071	0.103	-	-
HCM Control Delay (s)	9.4	-	18.1	11.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.2	0.3	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	170	25	132	200	216	41	431	109	202	436	158
Future Volume (vph)	167	170	25	132	200	216	41	431	109	202	436	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	150		200	150		250	225		175
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00				0.99	
Frt			0.850			0.850		0.970			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1495	1744	1853	1575	1604	3338	0	1753	3296	0
Flt Permitted	0.301			0.360			0.343			0.346		
Satd. Flow (perm)	561	1863	1495	661	1853	1575	578	3338	0	638	3296	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			1571			1063			1514	
Travel Time (s)		24.4			30.6			20.7			29.5	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	8%	3%	2%	2%	12%	5%	2%	4%	6%	4%
Adj. Flow (vph)	186	189	28	147	222	240	46	479	121	224	484	176
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	189	28	147	222	240	46	600	0	224	660	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	8		4	4		8	6			2		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	11.9	12.5	12.8	14.0	12.5	12.8	12.8	34.0		12.8	18.0	
Total Split (s)	21.0	30.0	17.0	21.0	30.0	30.0	17.0	39.0		30.0	52.0	
Total Split (%)	17.5%	25.0%	14.2%	17.5%	25.0%	25.0%	14.2%	32.5%		25.0%	43.3%	
Maximum Green (s)	16.1	24.5	11.2	14.0	24.5	24.2	11.2	33.0		24.2	46.0	
Yellow Time (s)	3.0	3.8	3.0	5.0	3.8	3.0	3.0	4.3		3.0	4.3	
All-Red Time (s)	1.9	1.7	2.8	2.0	1.7	2.8	2.8	1.7		2.8	1.7	
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0		-0.8	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	6.6	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	1.0	1.0	3.0	1.0	1.0	1.0	2.0		1.0	2.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	31.7	16.5	29.3	28.5	18.6	34.1	69.3	52.8		68.3	63.1	
Actuated g/C Ratio	0.26	0.14	0.24	0.24	0.16	0.28	0.58	0.44		0.57	0.53	

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) Noon
12/23/2020

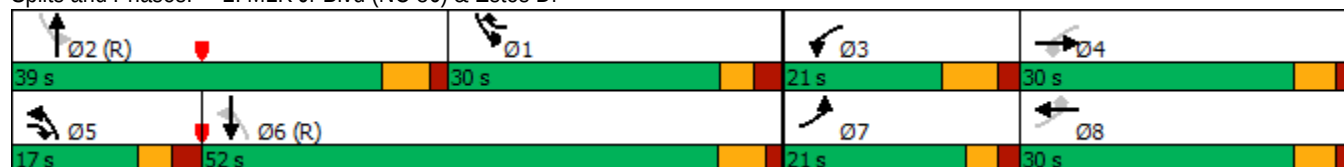
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.66	0.74	0.08	0.53	0.78	0.54	0.12	0.41		0.44	0.38	
Control Delay	42.9	66.4	33.2	38.3	66.4	25.6	12.5	26.1		21.7	20.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	42.9	66.4	33.2	38.3	66.4	25.6	12.5	26.1		21.7	20.9	
LOS	D	E	C	D	E	C	B	C		C	C	
Approach Delay		53.2			43.5			25.1			21.1	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)	112	143	17	88	168	111	13	164		102	212	
Queue Length 95th (ft)	153	210	39	126	239	131	36	260		120	295	
Internal Link Dist (ft)		1171			1491			983			1434	
Turn Bay Length (ft)	225		350	150		200	150			225		
Base Capacity (vph)	324	388	417	303	386	572	452	1468		645	1732	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.49	0.07	0.49	0.58	0.42	0.10	0.41		0.35	0.38	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 16 (13%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 32.6
 Intersection Capacity Utilization 63.0%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	170	25	132	200	216	41	431	109	202	436	158
Future Volume (veh/h)	167	170	25	132	200	216	41	431	109	202	436	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1781	1850	1864	1864	1716	1820	1820	1919	1889	1889
Adj Flow Rate, veh/h	186	189	28	147	222	240	46	479	121	224	484	176
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	8	3	2	2	12	5	5	4	6	6
Cap, veh/h	264	264	296	270	262	815	525	584	147	778	1382	499
Arrive On Green	0.10	0.14	0.14	0.09	0.14	0.14	0.05	0.21	0.21	0.75	1.00	1.00
Sat Flow, veh/h	1781	1870	1510	1762	1864	1580	1635	2731	685	1827	2578	931
Grp Volume(v), veh/h	186	189	28	147	222	240	46	302	298	224	336	324
Grp Sat Flow(s),veh/h/ln	1781	1870	1510	1762	1864	1580	1635	1729	1687	1827	1794	1716
Q Serve(g_s), s	10.6	11.6	1.8	8.4	13.9	3.0	1.4	20.0	20.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.6	11.6	1.8	8.4	13.9	3.0	1.4	20.0	20.2	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		0.54
Lane Grp Cap(c), veh/h	264	264	296	270	262	815	525	370	361	778	962	920
V/C Ratio(X)	0.70	0.72	0.09	0.55	0.85	0.29	0.09	0.82	0.83	0.29	0.35	0.35
Avail Cap(c_a), veh/h	315	390	397	322	388	922	602	490	478	778	962	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	39.7	49.2	39.5	39.4	50.3	5.8	10.5	44.9	45.2	9.2	0.0	0.0
Incr Delay (d2), s/veh	3.9	1.4	0.1	1.7	7.3	0.1	0.0	17.8	19.0	0.1	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	5.5	0.7	3.7	7.0	1.5	0.5	10.3	10.3	1.6	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	50.6	39.6	41.1	57.6	5.8	10.6	62.7	64.2	9.2	1.0	1.0
LnGrp LOS	D	D	D	D	E	A	B	E	E	A	A	A
Approach Vol, veh/h		403			609			646			884	
Approach Delay, s/veh		46.6			33.2			59.7			3.1	
Approach LOS		D			C			E			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	49.9	30.7	17.4	22.0	11.3	69.3	17.5	21.9				
Change Period (Y+Rc), s	* 6	* 6	7.0	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 24	* 33	14.0	24.5	* 11	* 46	* 16	24.5				
Max Q Clear Time (g_c+I1), s	2.0	22.2	10.4	13.6	3.4	2.0	12.6	15.9				
Green Ext Time (p_c), s	0.1	1.8	0.1	0.3	0.0	2.8	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Existing (2020) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	3	0	14	63	1	23	21	767	53	25	732	2
Future Volume (vph)	3	0	14	63	1	23	21	767	53	25	732	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00		1.00		
Frt		0.850			0.856			0.990				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1113	0	3364	1444	0	1463	3484	0	1770	3471	0
Flt Permitted	0.950			0.950			0.334			0.299		
Satd. Flow (perm)	1762	1113	0	3355	1444	0	514	3484	0	557	3471	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1514			2618	
Travel Time (s)		18.9			12.9			29.5			51.0	
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	43%	2%	2%	9%	24%	3%	2%	2%	4%	2%
Adj. Flow (vph)	3	0	16	70	1	26	23	852	59	28	813	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	16	0	70	27	0	23	911	0	28	815	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	22.0	22.0		26.0	26.0		72.0	72.0		72.0	72.0	
Total Split (%)	18.3%	18.3%		21.7%	21.7%		60.0%	60.0%		60.0%	60.0%	
Maximum Green (s)	16.4	16.4		20.1	20.1		66.2	66.2		66.5	66.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Existing (2020) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.8	7.8		8.2	8.2		100.1	100.1		100.1	100.1	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.83	0.83		0.83	0.83	
v/c Ratio	0.03	0.22		0.30	0.27		0.05	0.31		0.06	0.28	
Control Delay	52.7	60.6		56.6	60.0		3.1	2.5		1.4	1.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.7	60.6		56.6	60.0		3.1	2.5		1.4	1.3	
LOS	D	E		E	E		A	A		A	A	
Approach Delay		59.4			57.6			2.5			1.3	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	12		27	20		1	25		2	32	
Queue Length 95th (ft)	13	36		51	51		m9	126		m4	33	
Internal Link Dist (ft)		474			583			1434			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	250	157		588	252		428	2905		464	2894	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.10		0.12	0.11		0.05	0.31		0.06	0.28	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 115 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.31
 Intersection Signal Delay: 5.4
 Intersection Capacity Utilization 39.7%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd



HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	2	186	11	7	14	153	634	2	19	570	93
Future Volume (vph)	107	2	186	11	7	14	153	634	2	19	570	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.98	1.00	0.99	1.00	1.00		0.99		0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.954		0.950	0.990		0.950			0.950		
Satd. Flow (prot)	1667	1676	1600	1664	1734	1567	3400	3500	0	1719	3471	1495
Flt Permitted	0.950	0.954		0.950	0.990		0.950			0.356		
Satd. Flow (perm)	1662	1672	1569	1629	1727	1545	3398	3500	0	640	3471	1476
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		9	9		2	1		10	10		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	5%	2%	2%	2%	3%	3%	50%	5%	4%	8%
Adj. Flow (vph)	119	2	207	12	8	16	170	704	2	21	633	103
Shared Lane Traffic (%)	49%			18%								
Lane Group Flow (vph)	61	60	207	10	10	16	170	706	0	21	633	103
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	25.0	19.0	19.0	18.0	25.0	53.0		18.0	46.0	30.0
Total Split (%)	25.0%	25.0%	20.8%	15.8%	15.8%	15.0%	20.8%	44.2%		15.0%	38.3%	25.0%
Maximum Green (s)	22.9	22.9	18.7	12.1	12.1	11.6	18.7	47.0		11.6	39.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	10.7	10.7	26.8	8.9	8.9	12.0	16.1	85.7		90.7	72.6	83.3
Actuated g/C Ratio	0.09	0.09	0.22	0.07	0.07	0.10	0.13	0.71		0.76	0.60	0.69
v/c Ratio	0.41	0.40	0.58	0.08	0.08	0.10	0.37	0.28		0.04	0.30	0.10
Control Delay	59.6	59.2	38.6	53.4	53.3	35.7	49.9	10.8		5.0	13.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.6	59.2	38.6	53.4	53.3	35.7	49.9	10.8		5.0	13.8	6.6
LOS	E	E	D	D	D	D	D	B		A	B	A
Approach Delay		46.3			45.5			18.4			12.6	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	48	47	136	7	7	12	56	68		2	101	16
Queue Length 95th (ft)	92	91	158	26	26	25	105	254		13	208	53
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	347	349	396	194	202	215	569	2499		615	2100	1090
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.18	0.17	0.52	0.05	0.05	0.07	0.30	0.28		0.03	0.30	0.09

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 21.3

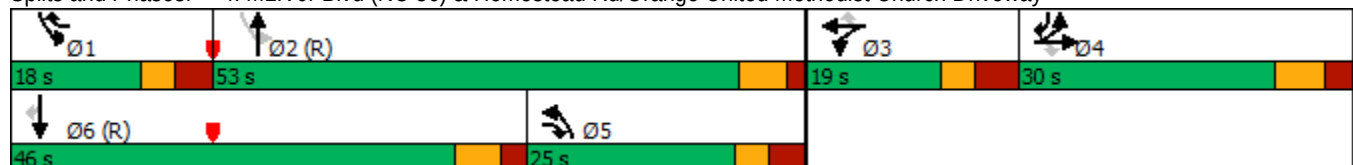
Intersection Capacity Utilization 63.3%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service B

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

Aura Chapel Hill TIA
5: Estes Dr & Sommerset Dr

Existing (2020) Noon
12/23/2020

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	485	496	11	12	8
Future Volume (vph)	11	485	496	11	12	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.945	
Flt Protected		0.999			0.971	
Satd. Flow (prot)	0	1840	1842	0	1604	0
Flt Permitted		0.999			0.971	
Satd. Flow (perm)	0	1840	1842	0	1604	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1571	840		813	
Travel Time (s)		30.6	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	2%	2%	18%	2%	25%
Adj. Flow (vph)	12	539	551	12	13	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	551	563	0	22	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 44.4%
Analysis Period (min) 15
ICU Level of Service A

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	485	496	11	12	8
Future Vol, veh/h	11	485	496	11	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	2	2	18	2	25
Mvmt Flow	12	539	551	12	13	9

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	563	0	0 1120 557
Stage 1	-	-	- 557 -
Stage 2	-	-	- 563 -
Critical Hdwy	4.19	-	- 5.42 5.95
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.281	-	- 3.518 3.525
Pot Cap-1 Maneuver	974	-	- 312 528
Stage 1	-	-	- 670 -
Stage 2	-	-	- 667 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	974	-	- 306 528
Mov Cap-2 Maneuver	-	-	- 306 -
Stage 1	-	-	- 658 -
Stage 2	-	-	- 667 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	974	-	-	-	368
HCM Lane V/C Ratio	0.013	-	-	-	0.06
HCM Control Delay (s)	8.7	0	-	-	15.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	441	2	1	423	26	2	4	2	23	0	75
Future Volume (vph)	56	441	2	1	423	26	2	4	2	23	0	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00							
Frt		0.999			0.991			0.966			0.850	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1753	1879	0	1770	1841	0	0	1535	0	1814	1592	0
Flt Permitted	0.432			0.472				0.916		0.752		
Satd. Flow (perm)	794	1879	0	879	1841	0	0	1423	0	1436	1592	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	4%	50%	2%	2%	2%	2%	4%
Adj. Flow (vph)	62	490	2	1	470	29	2	4	2	26	0	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	492	0	1	499	0	0	8	0	26	83	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	14.0	67.0		67.0	53.0		23.0	23.0		23.0	23.0	
Total Split (%)	15.6%	74.4%		74.4%	58.9%		25.6%	25.6%		25.6%	25.6%	
Maximum Green (s)	8.4	61.4		61.4	47.4		18.1	18.1		17.6	17.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	69.2	74.2		74.2	64.2			8.1		9.2	9.2	
Actuated g/C Ratio	0.77	0.82		0.82	0.71			0.09		0.10	0.10	

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) Noon
12/23/2020

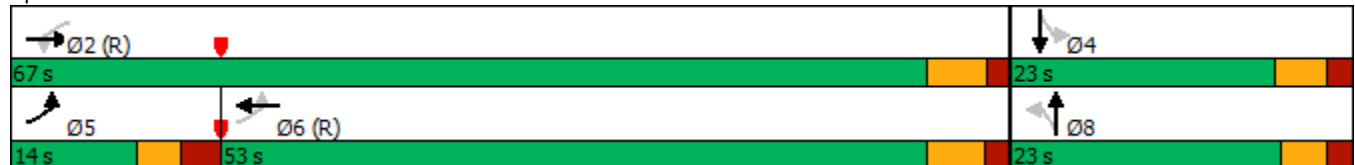
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.09	0.32		0.00	0.38			0.06		0.18	0.51	
Control Delay	2.9	3.4		3.0	8.4			37.0		38.6	48.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.9	3.4		3.0	8.4			37.0		38.6	48.8	
LOS	A	A		A	A			D		D	D	
Approach Delay		3.3			8.4			37.0			46.4	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	6	58		0	119			4		14	46	
Queue Length 95th (ft)	16	116		1	209			17		37	88	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	716	1550		725	1312			284		287	318	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.09	0.32		0.00	0.38			0.03		0.09	0.26	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 9.7
Intersection Capacity Utilization 50.0%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	441	2	1	423	26	2	4	2	23	0	75
Future Volume (veh/h)	56	441	2	1	423	26	2	4	2	23	0	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1919	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	62	490	2	1	470	29	2	4	2	26	0	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	1236	5	290	1198	74	59	65	25	214	0	137
Arrive On Green	0.07	0.64	0.63	0.12	0.69	0.68	0.07	0.07	0.07	0.08	0.00	0.07
Sat Flow, veh/h	1827	1939	8	1781	1743	108	129	890	340	1558	0	1751
Grp Volume(v), veh/h	62	0	492	1	0	499	8	0	0	26	0	83
Grp Sat Flow(s),veh/h/ln	1827	0	1947	1781	0	1851	1359	0	0	1558	0	1751
Q Serve(g_s), s	0.8	0.0	11.0	0.1	0.0	10.4	0.0	0.0	0.0	0.0	0.0	4.1
Cycle Q Clear(g_c), s	0.8	0.0	11.0	0.1	0.0	10.4	4.1	0.0	0.0	1.2	0.0	4.1
Prop In Lane	1.00		0.00	1.00		0.06	0.25		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	204	0	1241	0	0	1272	150	0	0	214	0	137
V/C Ratio(X)	0.30	0.00	0.40	0.00	0.00	0.39	0.05	0.00	0.00	0.12	0.00	0.61
Avail Cap(c_a), veh/h	263	0	1341	0	0	1272	325	0	0	404	0	350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	7.9	0.0	0.0	6.0	38.9	0.0	0.0	38.8	0.0	40.4
Incr Delay (d2), s/veh	0.3	0.0	0.9	0.0	0.0	0.9	0.1	0.0	0.0	0.1	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	4.2	0.0	0.0	3.5	0.2	0.0	0.0	0.5	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	8.9	0.0	0.0	6.9	38.9	0.0	0.0	38.9	0.0	42.0
LnGrp LOS	C	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h		554			500			8			109	
Approach Delay, s/veh		10.6			6.9			38.9			41.2	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	62.4		12.0	11.1	66.9		12.0				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 61	* 61		* 18	8.4	47.4		* 18				
Max Q Clear Time (g_c+I1), s	2.1	13.0		6.1	2.8	12.4		6.1				
Green Ext Time (p_c), s	0.0	2.0		0.1	0.0	2.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay 12.1
HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	246	45	154	263	181	43	396	128	116	387	242
Future Volume (vph)	272	246	45	154	263	181	43	396	128	116	387	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00		0.97	0.99	0.99		1.00	0.98	
Frt		0.977				0.850		0.963			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1823	0	1725	1816	1544	1743	3285	0	1778	3261	0
Flt Permitted	0.950			0.356			0.950			0.950		
Satd. Flow (perm)	1761	1823	0	644	1816	1502	1720	3285	0	1771	3261	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	9		6	6		9	8		4	4		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	3%	2%
Adj. Flow (vph)	302	273	50	171	292	201	48	440	142	129	430	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	302	323	0	171	292	201	48	582	0	129	699	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	48.0	55.0		24.0	31.0	24.0	24.0	37.0		24.0	37.0	
Total Split (%)	34.3%	39.3%		17.1%	22.1%	17.1%	17.1%	26.4%		17.1%	26.4%	
Maximum Green (s)	42.1	49.1		18.4	25.1	18.1	17.8	31.3		18.1	31.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	29.3	43.7		57.0	27.7	42.7	9.4	48.0		14.9	56.2	
Actuated g/C Ratio	0.21	0.31		0.41	0.20	0.30	0.07	0.34		0.11	0.40	

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) Noon
12/23/2020

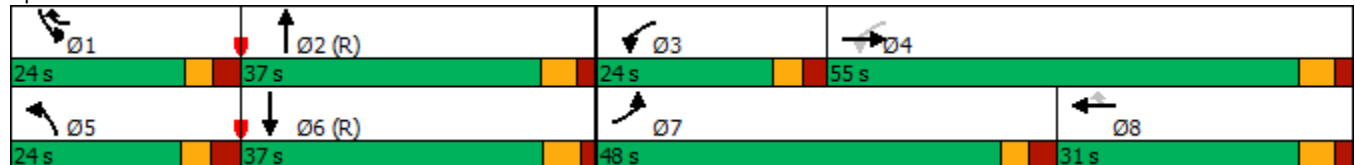
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.81	0.57		0.47	0.81	0.44	0.41	0.52		0.68	0.53	
Control Delay	69.3	43.4		26.9	71.4	37.1	73.0	41.8		77.8	37.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	69.3	43.4		26.9	71.4	37.1	73.0	41.8		77.8	37.2	
LOS	E	D		C	E	D	E	D		E	D	
Approach Delay		55.9			49.6			44.2			43.5	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	264	243		93	254	136	43	227		115	263	
Queue Length 95th (ft)	346	315		123	358	194	85	334		182	385	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	546	658		429	373	506	236	1127		241	1309	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.55	0.49		0.40	0.78	0.40	0.20	0.52		0.54	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 108 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 47.9
Intersection Capacity Utilization 78.8%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	246	45	154	263	181	43	396	128	116	387	242
Future Volume (veh/h)	272	246	45	154	263	181	43	396	128	116	387	242
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1788	1788	1909	1894	1894
Adj Flow Rate, veh/h	302	273	50	171	292	201	48	440	142	129	430	269
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	3	3
Cap, veh/h	338	437	80	324	320	399	88	998	319	164	921	571
Arrive On Green	0.19	0.28	0.27	0.09	0.19	0.19	0.05	0.40	0.39	0.09	0.43	0.43
Sat Flow, veh/h	1818	1567	287	1641	1723	1439	1731	2524	807	1818	2125	1317
Grp Volume(v), veh/h	302	0	323	171	292	201	48	295	287	129	364	335
Grp Sat Flow(s),veh/h/ln	1818	0	1854	1641	1723	1439	1731	1698	1633	1818	1800	1643
Q Serve(g_s), s	22.7	0.0	21.3	10.3	23.3	16.5	3.8	17.8	18.1	9.7	20.1	20.4
Cycle Q Clear(g_c), s	22.7	0.0	21.3	10.3	23.3	16.5	3.8	17.8	18.1	9.7	20.1	20.4
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.49	1.00		0.80
Lane Grp Cap(c), veh/h	338	0	517	324	320	399	88	672	646	164	780	712
V/C Ratio(X)	0.89	0.00	0.62	0.53	0.91	0.50	0.55	0.44	0.44	0.79	0.47	0.47
Avail Cap(c_a), veh/h	559	0	662	395	320	399	235	672	646	247	780	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.7	0.0	44.2	33.1	55.9	42.7	64.9	30.9	31.2	62.4	28.2	28.4
Incr Delay (d2), s/veh	6.2	0.0	0.5	0.5	28.5	0.4	1.9	2.1	2.2	4.7	2.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	0.0	9.8	4.1	12.6	5.9	1.7	7.7	7.5	4.7	9.1	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	0.0	44.6	33.6	84.4	43.1	66.8	33.0	33.4	67.1	30.2	30.6
LnGrp LOS	E	A	D	C	F	D	E	C	C	E	C	C
Approach Vol, veh/h		625			664			630			828	
Approach Delay, s/veh		53.0			58.8			35.8			36.1	
Approach LOS		D			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.6	60.4	18.0	44.0	12.1	65.9	31.0	31.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	18.1	* 31	18.4	49.1	* 18	* 32	42.1	25.1				
Max Q Clear Time (g_c+I1), s	11.7	20.1	12.3	23.3	5.8	22.4	24.7	25.3				
Green Ext Time (p_c), s	0.1	1.8	0.1	1.2	0.0	2.0	0.4	0.0				

Intersection Summary

HCM 6th Ctrl Delay	45.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Existing (2020) PM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	31	59	23	1252	756	5
Future Volume (vph)	31	59	23	1252	756	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1538	1656	3539	3502	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1538	1656	3539	3502	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	12		4			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	5%	9%	2%	3%	2%
Adj. Flow (vph)	34	66	26	1391	840	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	66	26	1391	846	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 44.6%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Existing (2020) PM
12/23/2020

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	59	23	1252	756	5
Future Vol, veh/h	31	59	23	1252	756	5
Conflicting Peds, #/hr	12	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	5	9	2	3	2
Mvmt Flow	34	66	26	1391	840	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1607	427	850
Stage 1	847	-	-
Stage 2	760	-	-
Critical Hdwy	6.84	7	4.28
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.35	2.29
Pot Cap-1 Maneuver	96	568	741
Stage 1	381	-	-
Stage 2	422	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	92	566	738
Mov Cap-2 Maneuver	220	-	-
Stage 1	366	-	-
Stage 2	420	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	738	-	220	566	-	-
HCM Lane V/C Ratio	0.035	-	0.157	0.116	-	-
HCM Control Delay (s)	10.1	-	24.4	12.2	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	239	56	165	300	414	66	1070	206	214	630	198
Future Volume (vph)	231	239	56	165	300	414	66	1070	206	214	630	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	150		200	150		0	225		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								0.99				
Frt			0.850			0.850		0.976			0.964	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1761	1853	1575	1761	3414	0	1787	3420	0
Flt Permitted	0.165			0.312			0.215			0.066		
Satd. Flow (perm)	307	1863	1583	578	1853	1575	398	3414	0	124	3420	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			1571			1063			1514	
Travel Time (s)		24.4			30.6			20.7			29.5	
Confl. Peds. (#/hr)									9	9		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	257	266	62	183	333	460	73	1189	229	238	700	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	266	62	183	333	460	73	1418	0	238	920	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	8		4	4		8	6			2		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0		12.8	18.0	
Total Split (s)	25.0	33.0	22.0	20.0	28.0	21.0	22.0	66.0		21.0	65.0	
Total Split (%)	17.9%	23.6%	15.7%	14.3%	20.0%	15.0%	15.7%	47.1%		15.0%	46.4%	
Maximum Green (s)	20.1	27.5	16.2	14.6	22.5	15.2	16.2	60.0		15.2	59.0	
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3		3.0	4.3	
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7		2.8	1.7	
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0		-0.8	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0		1.0	2.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	43.0	29.8	42.8	43.0	24.8	41.3	77.0	60.5		77.0	69.0	
Actuated g/C Ratio	0.31	0.21	0.31	0.31	0.18	0.30	0.55	0.43		0.55	0.49	

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) PM
12/23/2020

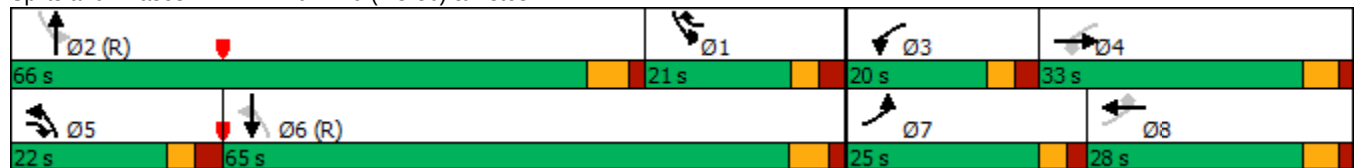
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.90	0.67	0.13	0.64	1.02	0.99	0.25	0.96		0.90	0.55	
Control Delay	72.8	60.6	36.8	44.8	109.6	77.4	14.8	54.5		76.2	15.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	72.8	60.6	36.8	44.8	109.6	77.4	14.8	54.5		76.2	15.7	
LOS	E	E	D	D	F	E	B	D		E	B	
Approach Delay		63.4			82.3			52.5			28.1	
Approach LOS		E			F			D			C	
Queue Length 50th (ft)	181	227	42	122	~342	~320	28	647		160	300	
Queue Length 95th (ft)	#331	331	79	187	#538	#600	51	#810		#334	280	
Internal Link Dist (ft)		1171			1491			983			1434	
Turn Bay Length (ft)	225		350	150		200	150			225		
Base Capacity (vph)	306	397	586	311	328	464	398	1487		264	1685	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.84	0.67	0.11	0.59	1.02	0.99	0.18	0.95		0.90	0.55	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 54.2
Intersection Capacity Utilization 93.4%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service F

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Existing (2020) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	239	56	165	300	414	66	1070	206	214	630	198
Future Volume (veh/h)	231	239	56	165	300	414	66	1070	206	214	630	198
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1864	1864	1864	1864	1864	1864	1949	1934	1934
Adj Flow Rate, veh/h	257	266	62	183	333	460	73	1189	229	238	700	220
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	3
Cap, veh/h	288	373	403	294	306	472	451	1262	241	310	1392	437
Arrive On Green	0.13	0.20	0.20	0.10	0.16	0.17	0.05	0.43	0.42	0.26	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1776	1864	1580	1776	2961	566	1856	2744	862
Grp Volume(v), veh/h	257	266	62	183	333	460	73	708	710	238	469	451
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1776	1864	1580	1776	1771	1755	1856	1837	1769
Q Serve(g_s), s	16.7	18.6	4.3	11.3	23.0	17.1	2.7	53.5	54.6	11.1	0.0	0.0
Cycle Q Clear(g_c), s	16.7	18.6	4.3	11.3	23.0	17.1	2.7	53.5	54.6	11.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.49
Lane Grp Cap(c), veh/h	288	373	403	294	306	472	451	755	748	310	932	897
V/C Ratio(X)	0.89	0.71	0.15	0.62	1.09	0.98	0.16	0.94	0.95	0.77	0.50	0.50
Avail Cap(c_a), veh/h	306	374	404	311	306	472	572	772	765	310	932	897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.92	0.92
Uniform Delay (d), s/veh	42.7	52.3	40.5	40.1	58.5	27.5	14.2	38.4	38.8	47.1	0.0	0.0
Incr Delay (d2), s/veh	24.2	5.4	0.1	2.4	76.7	34.8	0.1	20.6	22.6	9.2	1.8	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	9.3	1.7	5.1	17.3	10.0	1.1	27.0	27.7	7.4	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	57.7	40.6	42.5	135.2	62.3	14.3	59.0	61.4	56.3	1.8	1.9
LnGrp LOS	E	E	D	D	F	E	B	E	E	E	A	A
Approach Vol, veh/h		585			976			1491			1158	
Approach Delay, s/veh		60.0			83.5			57.9			13.0	
Approach LOS		E			F			E			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.7	64.7	18.7	32.9	12.4	76.0	23.6	28.0				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 15	* 60	14.6	27.5	* 16	* 59	* 20	22.5				
Max Q Clear Time (g_c+I1), s	13.1	56.6	13.3	20.6	4.7	2.0	18.7	25.0				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.3	0.0	4.2	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Existing (2020) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	24	7	26	102	1	31	14	1532	138	42	941	18
Future Volume (vph)	24	7	26	102	1	31	14	1532	138	42	941	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00				
Frt		0.882			0.854			0.988			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1643	0	3364	1488	0	1778	3503	0	1770	3529	0
Flt Permitted	0.950			0.950			0.246			0.085		
Satd. Flow (perm)	1736	1643	0	3364	1488	0	461	3503	0	158	3529	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1514			2618	
Travel Time (s)		18.9			12.9			29.5			51.0	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	27	8	29	113	1	34	16	1702	153	47	1046	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	37	0	113	35	0	16	1855	0	47	1066	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	21.0	21.0		26.0	26.0		93.0	93.0		93.0	93.0	
Total Split (%)	15.0%	15.0%		18.6%	18.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	15.4	15.4		20.1	20.1		87.2	87.2		87.5	87.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

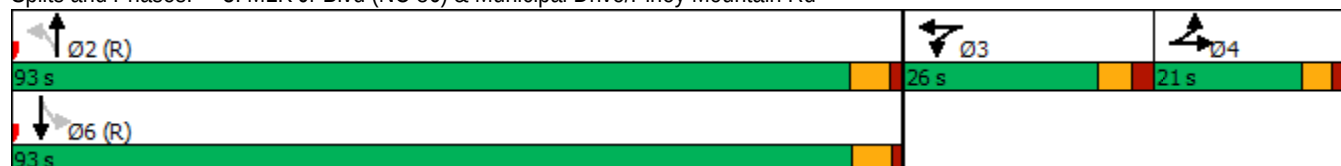
Existing (2020) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	8.4	8.4		9.4	9.4		109.8	109.8		109.8	109.8	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.78	0.78		0.78	0.78	
v/c Ratio	0.26	0.38		0.50	0.35		0.04	0.68		0.38	0.39	
Control Delay	68.8	74.1		70.6	71.8		3.2	4.2		19.7	8.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.8	74.1		70.6	71.8		3.2	4.2		19.7	8.5	
LOS	E	E		E	E		A	A		B	A	
Approach Delay		71.8			70.9			4.2			8.9	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	24	33		52	31		2	166		28	334	
Queue Length 95th (ft)	56	71		84	68		m3	m245		45	33	
Internal Link Dist (ft)		474			583			1434			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	198	187		504	223		361	2746		123	2766	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.20		0.22	0.16		0.04	0.68		0.38	0.39	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 133 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 10.3
Intersection Capacity Utilization 64.7%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service C
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd



HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	0	177	2	2	1	250	1326	0	7	807	191
Future Volume (vph)	203	0	177	2	2	1	250	1326	0	7	807	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.97	0.95		0.98	1.00					0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1748	1748	1647	1664	1752	1567	3433	3539	0	1770	3539	1583
Flt Permitted	0.950	0.950		0.950			0.950			0.130		
Satd. Flow (perm)	1743	1743	1597	1575	1752	1543	3429	3539	0	242	3539	1561
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		21	21		2	2		25	25		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	226	0	197	2	2	1	278	1473	0	8	897	212
Shared Lane Traffic (%)	50%			10%								
Lane Group Flow (vph)	113	113	197	2	2	1	278	1473	0	8	897	212
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	29.0	19.0	19.0	16.0	29.0	75.0		16.0	62.0	30.0
Total Split (%)	21.4%	21.4%	20.7%	13.6%	13.6%	11.4%	20.7%	53.6%		11.4%	44.3%	21.4%
Maximum Green (s)	22.9	22.9	22.7	12.1	12.1	9.6	22.7	69.0		9.6	55.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	
Pedestrian Calls (#/hr)								0			0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	14.6	14.6	44.4	8.9	8.9	10.2	29.8	107.3		110.6	77.9	92.4
Actuated g/C Ratio	0.10	0.10	0.32	0.06	0.06	0.07	0.21	0.77		0.79	0.56	0.66
v/c Ratio	0.62	0.62	0.38	0.02	0.02	0.01	0.38	0.54		0.03	0.46	0.21
Control Delay	74.3	74.3	32.4	62.0	62.0	45.0	41.8	7.4		5.1	20.9	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	74.3	74.3	32.4	62.0	62.0	45.0	41.8	7.4		5.1	20.9	9.0
LOS	E	E	C	E	E	D	D	A		A	C	A
Approach Delay		54.8			58.6			12.8			18.6	
Approach LOS		D			E			B			B	
Queue Length 50th (ft)	105	105	118	2	2	1	85	118		1	271	72
Queue Length 95th (ft)	169	169	169	11	11	5	156	431		8	356	108
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	312	312	522	166	175	143	742	2712		313	1968	1090
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.36	0.36	0.38	0.01	0.01	0.01	0.37	0.54		0.03	0.46	0.19

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 71 (51%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 20.2

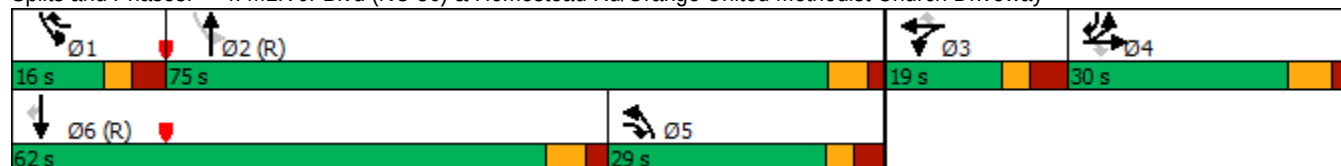
Intersection LOS: C

Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	665	844	15	14	6
Future Volume (vph)	2	665	844	15	14	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.959	
Flt Protected					0.966	
Satd. Flow (prot)	0	1844	1850	0	1769	0
Flt Permitted					0.966	
Satd. Flow (perm)	0	1844	1850	0	1769	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1571	840		813	
Travel Time (s)		30.6	16.4		22.2	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	739	938	17	16	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	741	955	0	23	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 55.7%

ICU Level of Service B

Analysis Period (min) 15

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	665	844	15	14	6
Future Vol, veh/h	2	665	844	15	14	6
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	739	938	17	16	7

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	955	0	0 1690 948
Stage 1	-	-	- 947 -
Stage 2	-	-	- 743 -
Critical Hdwy	4.12	-	- 5.42 5.72
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	720	-	- 164 361
Stage 1	-	-	- 490 -
Stage 2	-	-	- 578 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	720	-	- 163 361
Mov Cap-2 Maneuver	-	-	- 163 -
Stage 1	-	-	- 488 -
Stage 2	-	-	- 578 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	25.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	720	-	-	-	195
HCM Lane V/C Ratio	0.003	-	-	-	0.114
HCM Control Delay (s)	10	0	-	-	25.8
HCM Lane LOS	B	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	556	7	2	686	49	2	3	1	35	3	167
Future Volume (vph)	115	556	7	2	686	49	2	3	1	35	3	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			0.99		0.99	0.96	
Frt		0.998			0.990			0.977			0.852	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1787	1877	0	1770	1841	0	0	1719	0	1814	1566	0
Flt Permitted	0.189			0.377				0.912		0.754		
Satd. Flow (perm)	356	1877	0	701	1841	0	0	1587	0	1422	1566	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	2		2	2		2	6		4	4		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	128	618	8	2	762	54	2	3	1	39	3	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	128	626	0	2	816	0	0	6	0	39	189	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	13.0	68.0		68.0	55.0		22.0	22.0		22.0	22.0	
Total Split (%)	14.4%	75.6%		75.6%	61.1%		24.4%	24.4%		24.4%	24.4%	
Maximum Green (s)	7.4	62.4		62.4	49.4		17.1	17.1		16.6	16.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	61.1	66.1		66.1	53.5			8.9		13.9	13.9	
Actuated g/C Ratio	0.68	0.73		0.73	0.59			0.10		0.15	0.15	
v/c Ratio	0.35	0.45		0.00	0.75			0.04		0.18	0.78	

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) PM
12/23/2020

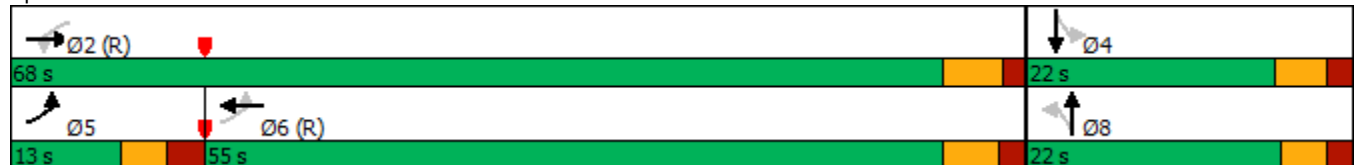
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	6.9	6.5		4.0	19.7			34.2		33.5	58.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	6.9	6.5		4.0	19.7			34.2		33.5	58.2	
LOS	A	A		A	B			C		C	E	
Approach Delay		6.6			19.7			34.2			54.0	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	18	122		0	319			3		19	104	
Queue Length 95th (ft)	37	202		2	517			13		47	#174	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	370	1379		515	1093			299		269	296	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.35	0.45		0.00	0.75			0.02		0.14	0.64	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 18.6
Intersection Capacity Utilization 69.3%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Existing (2020) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	556	7	2	686	49	2	3	1	35	3	167
Future Volume (veh/h)	115	556	7	2	686	49	2	3	1	35	3	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	128	618	8	2	762	54	2	3	1	39	3	186
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	1104	14	290	1056	75	66	70	17	242	4	237
Arrive On Green	0.08	0.58	0.57	0.12	0.61	0.61	0.14	0.13	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1856	1919	25	1781	1726	122	93	521	123	1540	27	1690
Grp Volume(v), veh/h	128	0	626	2	0	816	6	0	0	39	0	189
Grp Sat Flow(s),veh/h/ln	1856	0	1944	1781	0	1848	737	0	0	1540	0	1717
Q Serve(g_s), s	2.0	0.0	18.2	0.1	0.0	27.6	0.0	0.0	0.0	0.0	0.0	9.6
Cycle Q Clear(g_c), s	2.0	0.0	18.2	0.1	0.0	27.6	9.6	0.0	0.0	3.0	0.0	9.6
Prop In Lane	1.00		0.01	1.00		0.07	0.33		0.17	1.00		0.98
Lane Grp Cap(c), veh/h	231	0	1118	0	0	1130	154	0	0	242	0	241
V/C Ratio(X)	0.55	0.00	0.56	0.00	0.00	0.72	0.04	0.00	0.00	0.16	0.00	0.78
Avail Cap(c_a), veh/h	245	0	1361	0	0	1130	223	0	0	316	0	324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	0.0	12.0	0.0	0.0	12.2	34.0	0.0	0.0	34.6	0.0	37.6
Incr Delay (d2), s/veh	1.2	0.0	2.0	0.0	0.0	4.0	0.0	0.0	0.0	0.1	0.0	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	7.6	0.0	0.0	10.9	0.1	0.0	0.0	0.8	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	0.0	14.0	0.0	0.0	16.2	34.0	0.0	0.0	34.7	0.0	43.5
LnGrp LOS	C	A	B	A	A	B	C	A	A	C	A	D
Approach Vol, veh/h		754			818			6			228	
Approach Delay, s/veh		16.2			16.1			34.0			42.0	
Approach LOS		B			B			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	56.8		17.6	12.3	60.1		17.6				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 62	* 62		* 17	7.4	49.4		* 17				
Max Q Clear Time (g_c+I1), s	2.1	20.2		11.6	4.0	29.6		11.6				
Green Ext Time (p_c), s	0.0	2.8		0.2	0.0	3.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	288	57	181	298	241	53	736	168	110	553	421
Future Volume (vph)	322	288	57	181	298	241	53	736	168	110	553	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99		0.97	0.98	0.99		0.99	0.96	
Frt		0.975				0.850		0.972			0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1816	0	1725	1816	1544	1743	3350	0	1761	3198	0
Flt Permitted	0.950			0.287			0.950			0.950		
Satd. Flow (perm)	1762	1816	0	517	1816	1503	1716	3350	0	1743	3198	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	8		13	13		8	15		17	17		15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	358	320	63	201	331	268	59	818	187	122	614	468
Shared Lane Traffic (%)												
Lane Group Flow (vph)	358	383	0	201	331	268	59	1005	0	122	1082	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	40.0	48.0		20.0	33.0	20.0	15.0	57.0		20.0	62.0	
Total Split (%)	26.7%	32.0%		13.3%	22.0%	13.3%	10.0%	38.0%		13.3%	41.3%	
Maximum Green (s)	34.1	42.1		14.4	27.1	14.1	8.8	51.3		14.1	56.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	33.0	48.7		62.6	29.6	43.4	9.2	53.7		13.7	60.8	
Actuated g/C Ratio	0.22	0.32		0.42	0.20	0.29	0.06	0.36		0.09	0.41	

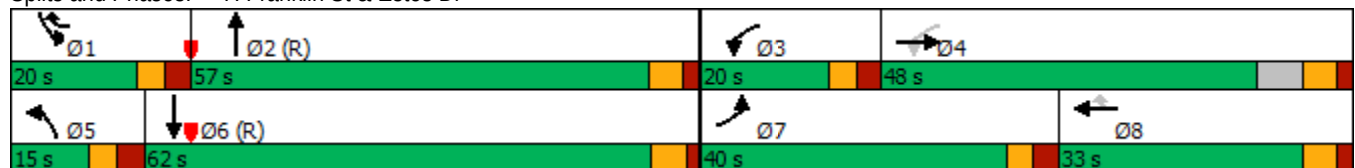
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.92	0.65		0.61	0.92	0.61	0.55	0.84		0.76	0.83	
Control Delay	85.7	49.5		34.5	90.4	49.2	87.7	52.2		94.1	48.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	85.7	49.5		34.5	90.4	49.2	87.7	52.2		94.1	48.1	
LOS	F	D		C	F	D	F	D		F	D	
Approach Delay		67.0			62.5			54.2			52.7	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	339	324		120	326	216	57	483		117	518	
Queue Length 95th (ft)	#510	444		180	#528	313	108	576		#207	621	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	414	594		340	358	451	116	1209		176	1305	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.86	0.64		0.59	0.92	0.59	0.51	0.83		0.69	0.83	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 104 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 58.0
Intersection Capacity Utilization 86.7%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: E
ICU Level of Service E

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Existing (2020) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	322	288	57	181	298	241	53	736	168	110	553	421
Future Volume (veh/h)	322	288	57	181	298	241	53	736	168	110	553	421
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1817	1817	1894	1909	1909
Adj Flow Rate, veh/h	358	320	63	201	331	268	59	818	187	122	614	468
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	2	2
Cap, veh/h	388	464	91	318	322	392	88	1059	242	154	805	612
Arrive On Green	0.21	0.30	0.29	0.10	0.19	0.19	0.05	0.38	0.38	0.09	0.41	0.41
Sat Flow, veh/h	1818	1545	304	1641	1723	1430	1731	2777	635	1804	1942	1478
Grp Volume(v), veh/h	358	0	383	201	331	268	59	508	497	122	573	509
Grp Sat Flow(s),veh/h/ln	1818	0	1850	1641	1723	1430	1731	1726	1686	1804	1814	1606
Q Serve(g_s), s	28.9	0.0	27.4	12.6	28.0	25.2	5.0	38.8	38.8	10.0	40.6	40.8
Cycle Q Clear(g_c), s	28.9	0.0	27.4	12.6	28.0	25.2	5.0	38.8	38.8	10.0	40.6	40.8
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.38	1.00		0.92
Lane Grp Cap(c), veh/h	388	0	555	318	322	392	88	658	643	154	752	666
V/C Ratio(X)	0.92	0.00	0.69	0.63	1.03	0.68	0.67	0.77	0.77	0.79	0.76	0.76
Avail Cap(c_a), veh/h	424	0	555	318	322	392	115	658	643	180	752	666
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	0.0	46.4	34.2	61.0	48.9	70.0	40.7	40.8	67.3	37.6	37.9
Incr Delay (d2), s/veh	23.4	0.0	3.0	3.1	57.9	4.1	4.1	8.6	8.8	15.5	7.2	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	0.0	13.1	5.3	17.3	9.4	2.3	17.9	17.6	5.2	19.4	17.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.2	0.0	49.4	37.2	118.9	53.0	74.0	49.3	49.6	82.8	44.8	46.0
LnGrp LOS	F	A	D	D	F	D	E	D	D	F	D	D
Approach Vol, veh/h		741			800			1064			1204	
Approach Delay, s/veh		64.8			76.3			50.8			49.2	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.8	62.2	20.0	50.0	12.6	67.4	37.0	33.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 51	14.4	42.1	* 8.8	* 57	34.1	27.1				
Max Q Clear Time (g_c+I1), s	12.0	40.8	14.6	29.4	7.0	42.8	30.9	30.0				
Green Ext Time (p_c), s	0.0	3.3	0.0	1.2	0.0	4.2	0.2	0.0				

Intersection Summary

HCM 6th Ctrl Delay	58.4
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

No-Build (2024) AM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	100	81	604	1108	120
Future Volume (vph)	4	100	81	604	1108	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.985	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1509	1719	3343	3426	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1509	1719	3343	3426	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	8		2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	7%	5%	8%	4%	2%
Adj. Flow (vph)	4	111	90	671	1231	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	111	90	671	1364	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.3%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

No-Build (2024) AM
12/23/2020

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	100	81	604	1108	120
Future Vol, veh/h	4	100	81	604	1108	120
Conflicting Peds, #/hr	8	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	7	5	8	4	2
Mvmt Flow	4	111	90	671	1231	133

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1824	684	1366
Stage 1	1300	-	-
Stage 2	524	-	-
Critical Hdwy	6.84	7.04	4.2
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.37	2.25
Pot Cap-1 Maneuver	69	380	483
Stage 1	219	-	-
Stage 2	559	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	56	379	482
Mov Cap-2 Maneuver	141	-	-
Stage 1	178	-	-
Stage 2	558	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.9	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	482	-	141	379	-	-
HCM Lane V/C Ratio	0.187	-	0.032	0.293	-	-
HCM Control Delay (s)	14.2	-	31.4	18.4	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	1.2	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	304	82	166	143	241	35	450	125	374	984	227
Future Volume (vph)	271	304	82	166	143	241	35	450	125	374	984	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		300	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3383	1818	1545	1761	3326	1545	1787	3506	1584
Flt Permitted	0.431			0.950			0.157			0.369		
Satd. Flow (perm)	803	1863	1583	3383	1818	1545	291	3326	1504	692	3506	1584
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			906			1063			488	
Travel Time (s)		24.4			17.6			20.7			9.5	
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	4%	4%	2%	8%	4%	2%	4%	3%
Adj. Flow (vph)	301	338	91	184	159	268	39	500	139	416	1093	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	301	338	91	184	159	268	39	500	139	416	1093	252
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	27.1	39.0	12.9	17.0	28.9	38.0	12.9	36.0	17.0	38.0	61.1	27.1
Total Split (%)	20.8%	30.0%	9.9%	13.1%	22.2%	29.2%	9.9%	27.7%	13.1%	29.2%	47.0%	20.8%
Maximum Green (s)	22.2	33.5	7.1	11.6	23.4	32.2	7.1	30.0	11.6	32.2	55.1	22.2
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	0.0	-0.8	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.0	5.0	4.9
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	37.6	27.2	40.0	10.4	17.7	45.2	72.4	45.0	54.6	72.4	64.6	89.6
Actuated g/C Ratio	0.29	0.21	0.31	0.08	0.14	0.35	0.56	0.35	0.42	0.56	0.50	0.69

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) AM
12/23/2020

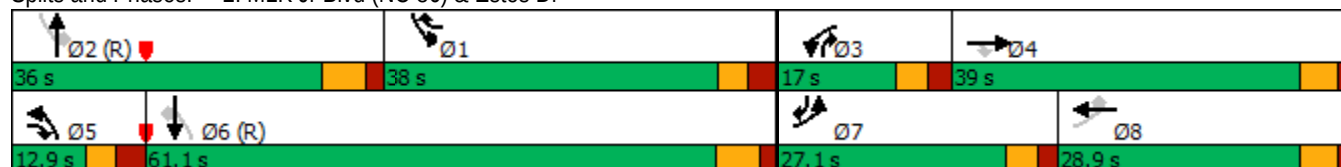
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.79	0.87	0.19	0.68	0.64	0.50	0.16	0.43	0.22	0.68	0.63	0.23
Control Delay	50.3	71.3	32.5	70.9	64.5	20.8	14.7	36.9	14.6	29.4	25.4	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	71.3	32.5	70.9	64.5	20.8	14.7	36.9	14.6	29.4	25.4	6.3
LOS	D	E	C	E	E	C	B	D	B	C	C	A
Approach Delay		57.8			47.3			31.1			23.6	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)	203	276	56	78	129	107	13	173	34	145	275	46
Queue Length 95th (ft)	267	368	94	118	193	118	34	261	67	301	433	87
Internal Link Dist (ft)		1171			826			983			408	
Turn Bay Length (ft)	225		350	300		300	150		250	225		175
Base Capacity (vph)	411	487	488	314	334	603	251	1150	654	692	1741	1122
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.69	0.19	0.59	0.48	0.44	0.16	0.43	0.21	0.60	0.63	0.22

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 84 (65%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 35.4
 Intersection Capacity Utilization 83.3%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	304	82	166	143	241	35	450	125	374	984	227
Future Volume (veh/h)	271	304	82	166	143	241	35	450	125	374	984	227
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1850	1835	1835	1864	1776	1835	1949	1919	1934
Adj Flow Rate, veh/h	301	338	91	184	159	268	39	500	139	416	1093	252
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	3	4	4	2	8	4	2	4	3
Cap, veh/h	365	374	394	244	197	777	270	619	377	812	1925	1120
Arrive On Green	0.16	0.20	0.20	0.07	0.11	0.11	0.05	0.18	0.18	0.39	0.53	0.52
Sat Flow, veh/h	1781	1870	1585	3417	1835	1555	1776	3374	1542	1856	3645	1634
Grp Volume(v), veh/h	301	338	91	184	159	268	39	500	139	416	1093	252
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1709	1835	1555	1776	1687	1542	1856	1823	1634
Q Serve(g_s), s	19.4	22.9	5.9	6.9	11.0	5.3	1.2	18.5	3.1	15.0	26.3	7.5
Cycle Q Clear(g_c), s	19.4	22.9	5.9	6.9	11.0	5.3	1.2	18.5	3.1	15.0	26.3	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	365	374	394	244	197	777	270	619	377	812	1925	1120
V/C Ratio(X)	0.83	0.90	0.23	0.75	0.81	0.34	0.14	0.81	0.37	0.51	0.57	0.22
Avail Cap(c_a), veh/h	375	489	492	315	337	896	295	804	462	812	1925	1120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	50.8	38.9	59.2	56.7	6.7	15.0	50.9	17.2	27.0	20.7	7.6
Incr Delay (d2), s/veh	12.8	14.7	0.1	5.0	3.0	0.1	0.1	10.9	2.8	0.2	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	12.2	2.3	3.1	5.2	2.2	0.5	8.7	2.2	9.3	11.2	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	65.5	39.0	64.2	59.7	6.8	15.1	61.7	20.0	27.2	21.9	8.1
LnGrp LOS	E	E	D	E	E	A	B	E	C	C	C	A
Approach Vol, veh/h		730			611			678			1761	
Approach Delay, s/veh		58.1			37.8			50.5			21.2	
Approach LOS		E			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	55.9	28.9	14.3	31.0	11.1	73.7	26.3	19.0				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 32	* 30	11.6	33.5	* 7.1	* 55	* 22	23.4				
Max Q Clear Time (g_c+I1), s	17.0	20.5	8.9	24.9	3.2	28.3	21.4	13.0				
Green Ext Time (p_c), s	0.2	1.8	0.0	0.5	0.0	6.3	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	36.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

No-Build (2024) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	2	0	7	163	1	41	14	895	64	22	1446	2
Future Volume (vph)	2	0	7	163	1	41	14	895	64	22	1446	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99		1.00				1.00		1.00		
Frt		0.850			0.853			0.990				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1234	0	3332	1542	0	1499	3413	0	1641	3505	0
Flt Permitted	0.950			0.950			0.122			0.246		
Satd. Flow (perm)	1770	1234	0	3320	1542	0	193	3413	0	425	3505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1027			2618	
Travel Time (s)		18.9			12.9			20.0			51.0	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	29%	3%	2%	3%	21%	5%	6%	10%	3%	2%
Adj. Flow (vph)	2	0	8	181	1	46	16	994	71	24	1607	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	8	0	181	47	0	16	1065	0	24	1609	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	20.0	20.0		24.0	24.0		86.0	86.0		86.0	86.0	
Total Split (%)	15.4%	15.4%		18.5%	18.5%		66.2%	66.2%		66.2%	66.2%	
Maximum Green (s)	14.4	14.4		18.1	18.1		80.2	80.2		80.5	80.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

No-Build (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.6	7.6		11.4	11.4		103.6	103.6		103.6	103.6	
Actuated g/C Ratio	0.06	0.06		0.09	0.09		0.80	0.80		0.80	0.80	
v/c Ratio	0.02	0.11		0.62	0.35		0.10	0.39		0.07	0.58	
Control Delay	58.0	61.7		66.4	62.1		5.4	4.6		2.6	3.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.0	61.7		66.4	62.1		5.4	4.6		2.6	3.0	
LOS	E	E		E	E		A	A		A	A	
Approach Delay		61.0			65.5			4.6			3.0	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	7		77	38		3	108		2	66	
Queue Length 95th (ft)	11	24		113	77		m6	142		m2	84	
Internal Link Dist (ft)		474			583			947			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	204	142		486	225		153	2719		338	2792	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.06		0.37	0.21		0.10	0.39		0.07	0.58	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 80 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 8.6
Intersection Capacity Utilization 59.7%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
ICU Level of Service B

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

 Ø2 (R)	 Ø3	 Ø4
86 s	24 s	20 s
 Ø6 (R)		
86 s		

HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	6	256	2	0	1	113	840	2	9	1204	123
Future Volume (vph)	224	6	256	2	0	1	113	840	2	9	1204	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00		1.00		0.98
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.955		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	1682	1695	1647	1664	1664	1567	3242	3468	0	1770	3505	1482
Flt Permitted	0.950	0.955		0.950	0.950		0.950			0.267		
Satd. Flow (perm)	1680	1692	1621	1646	1646	1546	3238	3468	0	497	3505	1457
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	1		4	4		1	5		1	1		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	8%	4%	50%	2%	3%	9%
Adj. Flow (vph)	249	7	284	2	0	1	126	933	2	10	1338	137
Shared Lane Traffic (%)	49%			50%								
Lane Group Flow (vph)	127	129	284	1	1	1	126	935	0	10	1338	137
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	28.0	28.0	28.0	17.0	17.0	17.0	28.0	68.0		17.0	57.0	28.0
Total Split (%)	21.5%	21.5%	21.5%	13.1%	13.1%	13.1%	21.5%	52.3%		13.1%	43.8%	21.5%
Maximum Green (s)	20.9	20.9	21.7	10.1	10.1	10.6	21.7	62.0		10.6	50.6	20.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	15.4	15.4	36.7	8.9	8.9	10.2	21.3	96.5		99.8	75.5	90.9
Actuated g/C Ratio	0.12	0.12	0.28	0.07	0.07	0.08	0.16	0.74		0.77	0.58	0.70
v/c Ratio	0.64	0.65	0.62	0.01	0.01	0.01	0.24	0.36		0.02	0.66	0.13
Control Delay	68.5	68.7	39.1	57.0	57.0	40.0	50.7	5.7		5.6	22.6	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.5	68.7	39.1	57.0	57.0	40.0	50.7	5.7		5.6	22.6	6.4
LOS	E	E	D	E	E	D	D	A		A	C	A
Approach Delay		53.1			51.3			11.0			21.0	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	109	110	192	1	1	1	54	28		1	375	28
Queue Length 95th (ft)	173	173	214	7	7	5	82	225		9	636	71
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	297	299	479	153	153	165	573	2573		504	2036	1072
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.43	0.43	0.59	0.01	0.01	0.01	0.22	0.36		0.02	0.66	0.13

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 39 (30%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 23.2

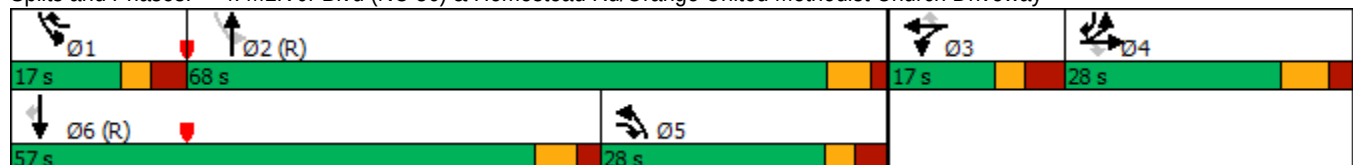
Intersection LOS: C

Intersection Capacity Utilization 67.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	769	533	13	17	15
Future Volume (vph)	21	769	533	13	17	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.936	
Flt Protected	0.950				0.974	
Satd. Flow (prot)	1752	1844	1830	0	1678	0
Flt Permitted	0.950				0.974	
Satd. Flow (perm)	1752	1844	1830	0	1678	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		665	840		813	
Travel Time (s)		13.0	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	2%	2%	10%
Adj. Flow (vph)	23	854	592	14	19	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	854	606	0	36	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.5%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	769	533	13	17	15
Future Vol, veh/h	21	769	533	13	17	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	2	2	10
Mvmt Flow	23	854	592	14	19	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	606	0	0 1499 599
Stage 1	-	-	- 599 -
Stage 2	-	-	- 900 -
Critical Hdwy	4.12	-	- 5.42 5.8
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.39
Pot Cap-1 Maneuver	972	-	- 204 529
Stage 1	-	-	- 648 -
Stage 2	-	-	- 510 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	972	-	- 199 529
Mov Cap-2 Maneuver	-	-	- 199 -
Stage 1	-	-	- 632 -
Stage 2	-	-	- 510 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	972	-	-	-	281
HCM Lane V/C Ratio	0.024	-	-	-	0.127
HCM Control Delay (s)	8.8	-	-	-	19.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

No-Build (2024) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	691	2	1	461	33	8	9	7	44	2	130
Future Volume (vph)	184	691	2	1	461	33	8	9	7	44	2	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.98			0.92	
Frt					0.990			0.960			0.852	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1787	1881	0	1770	1806	0	0	1698	0	1814	1467	0
Flt Permitted	0.366			0.306				0.888		0.740		
Satd. Flow (perm)	685	1881	0	570	1806	0	0	1507	0	1413	1467	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	8		2	2		8	21					21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	4%
Adj. Flow (vph)	204	768	2	1	512	37	9	10	8	49	2	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	204	770	0	1	549	0	0	27	0	49	146	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	16.0	66.0		66.0	50.0		24.0	24.0		24.0	24.0	
Total Split (%)	17.8%	73.3%		73.3%	55.6%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	10.4	60.4		60.4	44.4		19.1	19.1		18.6	18.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	62.1	67.1		67.1	53.9			10.9		12.9	12.9	
Actuated g/C Ratio	0.69	0.75		0.75	0.60			0.12		0.14	0.14	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.36	0.55		0.00	0.51			0.15		0.24	0.70	
Control Delay	5.9	7.5		4.0	13.7			34.3		35.3	53.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	5.9	7.5		4.0	13.7			34.3		35.3	53.4	
LOS	A	A		A	B			C		D	D	
Approach Delay		7.1			13.7			34.3			48.9	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	27	153		0	161			15		25	80	
Queue Length 95th (ft)	61	305		2	312			35		54	133	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	628	1402		425	1080			318		298	309	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.32	0.55		0.00	0.51			0.08		0.16	0.47	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.3
Intersection Capacity Utilization 68.6%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

No-Build (2024) AM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	691	2	1	461	33	8	9	7	44	2	130
Future Volume (veh/h)	184	691	2	1	461	33	8	9	7	44	2	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.96		0.92	0.95		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1841	1841	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	204	768	2	1	512	37	9	10	8	49	2	144
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	4	4	2	2	2	2	2	2
Cap, veh/h	251	1122	3	290	1022	74	73	63	35	252	3	221
Arrive On Green	0.09	0.58	0.57	0.12	0.60	0.60	0.13	0.13	0.13	0.14	0.14	0.13
Sat Flow, veh/h	1856	1943	5	1781	1695	123	149	477	264	1463	22	1597
Grp Volume(v), veh/h	204	0	770	1	0	549	27	0	0	49	0	146
Grp Sat Flow(s),veh/h/ln	1856	0	1948	1781	0	1818	889	0	0	1463	0	1619
Q Serve(g_s), s	5.7	0.0	24.9	0.1	0.0	15.5	0.1	0.0	0.0	0.0	0.0	7.7
Cycle Q Clear(g_c), s	5.7	0.0	24.9	0.1	0.0	15.5	7.8	0.0	0.0	3.6	0.0	7.7
Prop In Lane	1.00		0.00	1.00		0.07	0.33		0.30	1.00		0.99
Lane Grp Cap(c), veh/h	251	0	1125	0	0	1096	172	0	0	252	0	224
V/C Ratio(X)	0.81	0.00	0.68	0.00	0.00	0.50	0.16	0.00	0.00	0.19	0.00	0.65
Avail Cap(c_a), veh/h	307	0	1320	0	0	1096	270	0	0	359	0	342
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	13.3	0.0	0.0	10.2	34.6	0.0	0.0	35.0	0.0	36.9
Incr Delay (d2), s/veh	10.5	0.0	3.4	0.0	0.0	1.6	0.2	0.0	0.0	0.1	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	10.6	0.0	0.0	5.9	0.5	0.0	0.0	1.0	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	0.0	16.7	0.0	0.0	11.8	34.7	0.0	0.0	35.1	0.0	38.1
LnGrp LOS	D	A	B	A	A	B	C	A	A	D	A	D
Approach Vol, veh/h		974			550			27			195	
Approach Delay, s/veh		21.8			11.8			34.7			37.4	
Approach LOS		C			B			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	57.0		17.4	13.3	59.3		17.4				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 60	* 60		* 19	10.4	44.4		* 19				
Max Q Clear Time (g_c+I1), s	2.1	26.9		9.7	7.7	17.5		9.8				
Green Ext Time (p_c), s	0.0	3.7		0.3	0.0	2.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

No-Build (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	352	51	106	213	112	44	366	83	94	555	250
Future Volume (vph)	360	352	51	106	213	112	44	366	83	94	555	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00				0.98	0.99	1.00		1.00	0.98	
Frt		0.981				0.850		0.972			0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1833	0	1692	1748	1514	1743	3294	0	1711	3299	0
Flt Permitted	0.950			0.227			0.950			0.950		
Satd. Flow (perm)	1764	1833	0	404	1748	1480	1725	3294	0	1708	3299	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	7		3	3		7	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	4%	6%	4%	2%	5%	2%	6%	3%	3%
Adj. Flow (vph)	400	391	57	118	237	124	49	407	92	104	617	278
Shared Lane Traffic (%)												
Lane Group Flow (vph)	400	448	0	118	237	124	49	499	0	104	895	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	35.0	35.0		35.0	35.0	20.0	20.0	40.0		20.0	40.0	
Total Split (%)	26.9%	26.9%		26.9%	26.9%	15.4%	15.4%	30.8%		15.4%	30.8%	
Maximum Green (s)	29.1	29.1		29.4	29.1	14.1	13.8	34.3		14.1	34.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	30.0	43.4		53.7	23.7	36.2	9.2	43.8		12.5	49.7	
Actuated g/C Ratio	0.23	0.33		0.41	0.18	0.28	0.07	0.34		0.10	0.38	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.98	0.73		0.44	0.75	0.30	0.40	0.45		0.63	0.71	
Control Delay	88.5	46.1		25.8	64.7	33.8	66.9	36.5		73.6	39.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.5	46.1		25.8	64.7	33.8	66.9	36.5		73.6	39.5	
LOS	F	D		C	E	C	E	D		E	D	
Approach Delay		66.1			47.1			39.2			43.0	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	337	338		59	194	79	41	170		85	334	
Queue Length 95th (ft)	#544	442		88	269	117	82	250		146	#510	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	410	612		479	403	444	201	1110		198	1261	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.98	0.73		0.25	0.59	0.28	0.24	0.45		0.53	0.71	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 124 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 49.8
Intersection Capacity Utilization 80.7%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 7: Franklin St & Estes Dr

					
Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)
20 s	40 s	35 s	35 s	20 s	40 s
					
Ø5	Ø6 (R)	Ø7	Ø8	Ø5	Ø6 (R)
20 s	40 s	35 s	35 s	20 s	40 s

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

No-Build (2024) AM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	352	51	106	213	112	44	366	83	94	555	250
Future Volume (veh/h)	360	352	51	106	213	112	44	366	83	94	555	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1693	1664	1693	1817	1773	1773	1849	1894	1894
Adj Flow Rate, veh/h	400	391	57	118	237	124	49	407	92	104	617	278
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	4	6	4	2	5	5	6	3	3
Cap, veh/h	420	548	80	270	288	358	93	992	222	139	929	419
Arrive On Green	0.23	0.34	0.33	0.07	0.17	0.17	0.05	0.36	0.36	0.08	0.39	0.38
Sat Flow, veh/h	1818	1628	237	1613	1664	1418	1731	2728	610	1761	2402	1082
Grp Volume(v), veh/h	400	0	448	118	237	124	49	250	249	104	462	433
Grp Sat Flow(s),veh/h/ln	1818	0	1865	1613	1664	1418	1731	1684	1654	1761	1800	1684
Q Serve(g_s), s	28.2	0.0	27.3	6.1	17.9	9.3	3.6	14.4	14.7	7.5	27.5	27.6
Cycle Q Clear(g_c), s	28.2	0.0	27.3	6.1	17.9	9.3	3.6	14.4	14.7	7.5	27.5	27.6
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.37	1.00		0.64
Lane Grp Cap(c), veh/h	420	0	627	270	288	358	93	612	601	139	696	652
V/C Ratio(X)	0.95	0.00	0.71	0.44	0.82	0.35	0.53	0.41	0.41	0.75	0.66	0.66
Avail Cap(c_a), veh/h	420	0	627	534	384	440	200	612	601	203	696	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	0.0	37.7	28.4	51.8	39.9	59.9	30.9	31.1	58.6	32.9	33.0
Incr Delay (d2), s/veh	31.8	0.0	3.3	0.4	7.8	0.2	1.7	2.0	2.1	3.8	4.9	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.4	0.0	12.9	2.4	8.0	3.3	1.6	6.2	6.2	3.5	12.8	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.1	0.0	41.0	28.9	59.7	40.1	61.6	32.9	33.2	62.5	37.8	38.3
LnGrp LOS	F	A	D	C	E	D	E	C	C	E	D	D
Approach Vol, veh/h		848			479			548			999	
Approach Delay, s/veh		59.9			47.0			35.6			40.6	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	52.3	13.8	48.7	12.0	55.5	35.0	27.5				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 34	29.4	29.1	* 14	* 35	29.1	29.1				
Max Q Clear Time (g_c+I1), s	9.5	16.7	8.1	29.3	5.6	29.6	30.2	19.9				
Green Ext Time (p_c), s	0.0	1.8	0.1	0.0	0.0	1.8	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

No-Build (2024) Noon
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	62	80	658	610	33
Future Volume (vph)	19	62	80	658	610	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.992	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1719	1538	1752	3438	3445	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1719	1538	1752	3438	3445	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	6					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	3%	5%	4%	3%
Adj. Flow (vph)	21	69	89	731	678	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	69	89	731	715	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.7%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	62	80	658	610	33
Future Vol, veh/h	19	62	80	658	610	33
Conflicting Peds, #/hr	6	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	3	5	4	3
Mvmt Flow	21	69	89	731	678	37

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1247	358	715
Stage 1	697	-	-
Stage 2	550	-	-
Critical Hdwy	6.9	7	4.16
Critical Hdwy Stg 1	5.9	-	-
Critical Hdwy Stg 2	5.9	-	-
Follow-up Hdwy	3.55	3.35	2.23
Pot Cap-1 Maneuver	161	630	875
Stage 1	447	-	-
Stage 2	533	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	145	630	875
Mov Cap-2 Maneuver	273	-	-
Stage 1	401	-	-
Stage 2	533	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	875	-	273	630	-	-
HCM Lane V/C Ratio	0.102	-	0.077	0.109	-	-
HCM Control Delay (s)	9.6	-	19.3	11.4	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.2	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	176	26	147	205	236	42	462	135	232	467	164
Future Volume (vph)	173	176	26	147	205	236	42	462	135	232	467	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		300	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1495	3383	1853	1575	1604	3421	1575	1753	3440	1568
Flt Permitted	0.289			0.950			0.418			0.390		
Satd. Flow (perm)	538	1863	1495	3383	1853	1575	704	3421	1575	720	3440	1530
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			913			1063			432	
Travel Time (s)		24.4			17.8			20.7			8.4	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	8%	3%	2%	2%	12%	5%	2%	4%	6%	4%
Adj. Flow (vph)	192	196	29	163	228	262	47	513	150	258	519	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	192	196	29	163	228	262	47	513	150	258	519	182
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	21.0	37.0	14.0	17.0	33.0	26.0	14.0	40.0	17.0	26.0	52.0	21.0
Total Split (%)	17.5%	30.8%	11.7%	14.2%	27.5%	21.7%	11.7%	33.3%	14.2%	21.7%	43.3%	17.5%
Maximum Green (s)	16.1	31.5	8.2	11.6	27.5	20.2	8.2	34.0	11.6	20.2	46.0	16.1
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	-1.4	-0.8	-1.0	-0.9
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	32.8	23.0	35.9	9.8	18.8	36.1	68.2	49.8	61.6	67.2	61.9	78.0
Actuated g/C Ratio	0.27	0.19	0.30	0.08	0.16	0.30	0.57	0.42	0.51	0.56	0.52	0.65

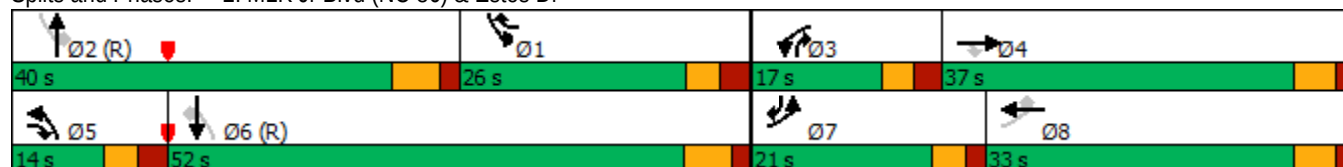
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.66	0.55	0.07	0.59	0.79	0.55	0.10	0.36	0.19	0.47	0.29	0.18
Control Delay	41.4	48.5	27.6	61.9	67.2	24.4	13.1	27.5	9.8	20.5	17.9	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	48.5	27.6	61.9	67.2	24.4	13.1	27.5	9.8	20.5	17.9	8.2
LOS	D	D	C	E	E	C	B	C	A	C	B	A
Approach Delay		43.8			48.7			22.8			16.8	
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	114	138	16	63	172	116	14	143	31	117	160	74
Queue Length 95th (ft)	154	197	36	97	245	129	38	230	65	116	213	96
Internal Link Dist (ft)		1171			833			983			352	
Turn Bay Length (ft)	225		350	300		300	150		250	225		175
Base Capacity (vph)	325	496	461	342	432	522	473	1421	839	606	1774	1031
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.40	0.06	0.48	0.53	0.50	0.10	0.36	0.18	0.43	0.29	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 16 (13%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 30.1
 Intersection Capacity Utilization 62.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	176	26	147	205	236	42	462	135	232	467	164
Future Volume (veh/h)	173	176	26	147	205	236	42	462	135	232	467	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1781	1850	1864	1864	1716	1820	1864	1919	1889	1919
Adj Flow Rate, veh/h	192	196	29	163	228	262	47	513	150	258	519	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	8	3	2	2	12	5	2	4	6	4
Cap, veh/h	268	345	362	228	269	844	452	668	425	808	1900	1043
Arrive On Green	0.11	0.18	0.19	0.07	0.14	0.15	0.05	0.19	0.20	0.39	0.53	0.53
Sat Flow, veh/h	1781	1870	1510	3417	1864	1580	1635	3458	1560	1827	3588	1618
Grp Volume(v), veh/h	192	196	29	163	228	262	47	513	150	258	519	182
Grp Sat Flow(s),veh/h/ln	1781	1870	1510	1709	1864	1580	1635	1729	1560	1827	1794	1618
Q Serve(g_s), s	10.9	11.5	1.8	5.6	14.3	3.4	1.5	16.9	2.7	4.4	9.5	5.4
Cycle Q Clear(g_c), s	10.9	11.5	1.8	5.6	14.3	3.4	1.5	16.9	2.7	4.4	9.5	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	345	362	228	269	844	452	668	425	808	1900	1043
V/C Ratio(X)	0.72	0.57	0.08	0.71	0.85	0.31	0.10	0.77	0.35	0.32	0.27	0.17
Avail Cap(c_a), veh/h	315	499	486	342	435	985	489	1009	579	808	1900	1043
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	44.6	35.4	54.9	50.1	5.2	11.3	45.9	14.7	22.5	15.5	8.6
Incr Delay (d2), s/veh	4.5	0.5	0.0	1.6	4.4	0.1	0.0	8.3	2.3	0.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.3	0.7	2.4	6.9	1.4	0.5	7.9	2.1	4.7	3.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	45.2	35.4	56.4	54.5	5.3	11.3	54.2	17.0	22.6	15.9	8.9
LnGrp LOS	D	D	D	E	D	A	B	D	B	C	B	A
Approach Vol, veh/h		417			653			710			959	
Approach Delay, s/veh		43.9			35.2			43.5			16.4	
Approach LOS		D			D			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	51.7	28.2	13.0	27.1	11.3	68.5	17.8	22.3				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 20	* 34	11.6	31.5	* 8.2	* 46	* 16	27.5				
Max Q Clear Time (g_c+I1), s	6.4	18.9	7.6	13.5	3.5	11.5	12.9	16.3				
Green Ext Time (p_c), s	0.1	2.2	0.0	0.3	0.0	2.6	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

No-Build (2024) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	3	0	14	64	1	24	21	823	54	27	798	2
Future Volume (vph)	3	0	14	64	1	24	21	823	54	27	798	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00		1.00		
Frt		0.850			0.855			0.991				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1113	0	3364	1442	0	1463	3488	0	1770	3471	0
Flt Permitted	0.950			0.950			0.307			0.278		
Satd. Flow (perm)	1762	1113	0	3355	1442	0	473	3488	0	518	3471	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1082			2618	
Travel Time (s)		18.9			12.9			21.1			51.0	
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	43%	2%	2%	9%	24%	3%	2%	2%	4%	2%
Adj. Flow (vph)	3	0	16	71	1	27	23	914	60	30	887	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	16	0	71	28	0	23	974	0	30	889	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	22.0	22.0		26.0	26.0		72.0	72.0		72.0	72.0	
Total Split (%)	18.3%	18.3%		21.7%	21.7%		60.0%	60.0%		60.0%	60.0%	
Maximum Green (s)	16.4	16.4		20.1	20.1		66.2	66.2		66.5	66.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

No-Build (2024) Noon
12/23/2020

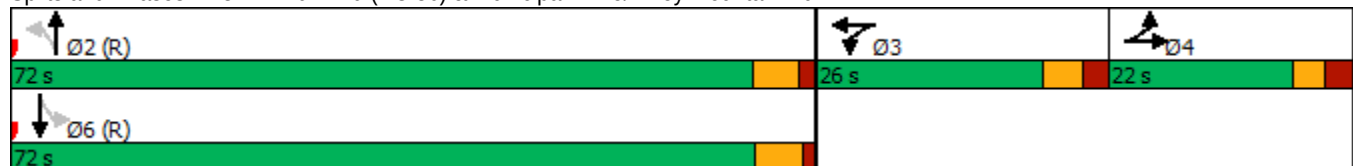
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.8	7.8		8.3	8.3		100.0	100.0		100.0	100.0	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.83	0.83		0.83	0.83	
v/c Ratio	0.03	0.22		0.31	0.29		0.06	0.34		0.07	0.31	
Control Delay	52.7	60.6		56.6	60.5		2.6	2.2		1.7	1.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.7	60.6		56.6	60.5		2.6	2.2		1.7	1.5	
LOS	D	E		E	E		A	A		A	A	
Approach Delay		59.4			57.7			2.2			1.5	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	12		27	21		1	27		2	37	
Queue Length 95th (ft)	13	36		51	52		m8	97		m5	39	
Internal Link Dist (ft)		474			583			1002			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	250	157		588	252		394	2907		431	2893	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.10		0.12	0.11		0.06	0.34		0.07	0.31	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 115 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 5.1
Intersection Capacity Utilization 41.3%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd



HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	2	194	11	7	14	160	681	2	19	625	95
Future Volume (vph)	109	2	194	11	7	14	160	681	2	19	625	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.98	1.00	0.99	1.00	1.00		0.99		0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.954		0.950	0.990		0.950			0.950		
Satd. Flow (prot)	1667	1676	1600	1664	1734	1567	3400	3500	0	1719	3471	1495
Flt Permitted	0.950	0.954		0.950	0.990		0.950			0.333		
Satd. Flow (perm)	1662	1672	1569	1629	1727	1545	3398	3500	0	599	3471	1476
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		9	9		2	1		10	10		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	5%	2%	2%	2%	3%	3%	50%	5%	4%	8%
Adj. Flow (vph)	121	2	216	12	8	16	178	757	2	21	694	106
Shared Lane Traffic (%)	49%			17%								
Lane Group Flow (vph)	62	61	216	10	10	16	178	759	0	21	694	106
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	25.0	19.0	19.0	18.0	25.0	53.0		18.0	46.0	30.0
Total Split (%)	25.0%	25.0%	20.8%	15.8%	15.8%	15.0%	20.8%	44.2%		15.0%	38.3%	25.0%
Maximum Green (s)	22.9	22.9	18.7	12.1	12.1	11.6	18.7	47.0		11.6	39.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	10.8	10.8	27.1	8.9	8.9	12.0	16.3	85.6		90.7	72.3	83.1
Actuated g/C Ratio	0.09	0.09	0.23	0.07	0.07	0.10	0.14	0.71		0.76	0.60	0.69
v/c Ratio	0.42	0.41	0.60	0.08	0.08	0.10	0.39	0.30		0.04	0.33	0.10
Control Delay	59.7	59.2	39.2	53.4	53.3	35.6	48.4	10.8		5.1	14.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.7	59.2	39.2	53.4	53.3	35.6	48.4	10.8		5.1	14.2	6.6
LOS	E	E	D	D	D	D	D	B		A	B	A
Approach Delay		46.5			45.5			18.0			13.0	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	49	48	141	7	7	12	57	68		2	115	17
Queue Length 95th (ft)	94	92	165	26	26	25	105	261		13	230	54
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	347	349	397	194	202	215	566	2496		587	2092	1087
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.18	0.17	0.54	0.05	0.05	0.07	0.31	0.30		0.04	0.33	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 21.1

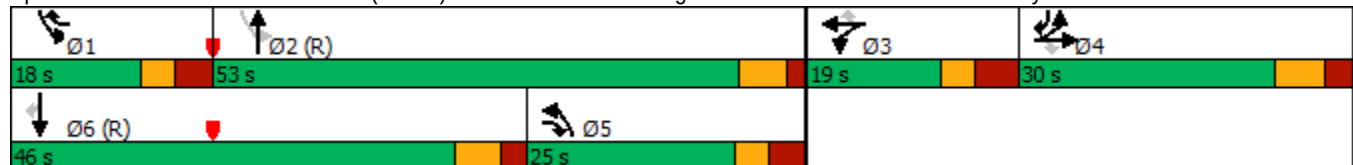
Intersection LOS: C

Intersection Capacity Utilization 63.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	535	524	19	20	19
Future Volume (vph)	24	535	524	19	20	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.934	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1639	1844	1834	0	1566	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1639	1844	1834	0	1566	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		658	840		813	
Travel Time (s)		12.8	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	2%	2%	18%	2%	25%
Adj. Flow (vph)	27	594	582	21	22	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	594	603	0	43	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 38.7%

ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	535	524	19	20	19
Future Vol, veh/h	24	535	524	19	20	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	2	2	18	2	25
Mvmt Flow	27	594	582	21	22	21

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	603	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.19	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.281	-	-
Pot Cap-1 Maneuver	941	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	941	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	941	-	-	-	345
HCM Lane V/C Ratio	0.028	-	-	-	0.126
HCM Control Delay (s)	8.9	-	-	-	16.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

No-Build (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	498	2	1	458	27	2	4	2	23	0	77
Future Volume (vph)	57	498	2	1	458	27	2	4	2	23	0	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00							
Frt		0.999			0.992			0.966			0.850	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1753	1879	0	1770	1843	0	0	1535	0	1814	1592	0
Flt Permitted	0.406			0.437				0.917		0.752		
Satd. Flow (perm)	747	1879	0	814	1843	0	0	1425	0	1436	1592	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	4%	50%	2%	2%	2%	2%	4%
Adj. Flow (vph)	63	553	2	1	509	30	2	4	2	26	0	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	555	0	1	539	0	0	8	0	26	86	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	14.0	67.0		67.0	53.0		23.0	23.0		23.0	23.0	
Total Split (%)	15.6%	74.4%		74.4%	58.9%		25.6%	25.6%		25.6%	25.6%	
Maximum Green (s)	8.4	61.4		61.4	47.4		18.1	18.1		17.6	17.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	69.1	74.1		74.1	64.0			8.1		9.4	9.4	
Actuated g/C Ratio	0.77	0.82		0.82	0.71			0.09		0.10	0.10	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.10	0.36		0.00	0.41			0.06		0.17	0.52	
Control Delay	3.0	3.7		3.0	8.8			36.9		38.3	49.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.0	3.7		3.0	8.8			36.9		38.3	49.2	
LOS	A	A		A	A			D		D	D	
Approach Delay		3.6			8.8			36.9			46.6	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	6	70		0	134			4		14	48	
Queue Length 95th (ft)	17	137		1	233			17		37	90	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	683	1547		670	1311			285		287	318	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.09	0.36		0.00	0.41			0.03		0.09	0.27	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 9.8
Intersection Capacity Utilization 53.0%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

No-Build (2024) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	498	2	1	458	27	2	4	2	23	0	77
Future Volume (veh/h)	57	498	2	1	458	27	2	4	2	23	0	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1919	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	63	553	2	1	509	30	2	4	2	26	0	86
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	1236	4	290	1201	71	61	64	25	213	0	137
Arrive On Green	0.07	0.64	0.63	0.12	0.69	0.68	0.08	0.07	0.07	0.08	0.00	0.07
Sat Flow, veh/h	1827	1940	7	1781	1748	103	148	873	341	1558	0	1751
Grp Volume(v), veh/h	63	0	555	1	0	539	8	0	0	26	0	86
Grp Sat Flow(s),veh/h/ln	1827	0	1947	1781	0	1851	1362	0	0	1558	0	1751
Q Serve(g_s), s	0.8	0.0	13.0	0.1	0.0	11.6	0.0	0.0	0.0	0.0	0.0	4.3
Cycle Q Clear(g_c), s	0.8	0.0	13.0	0.1	0.0	11.6	4.3	0.0	0.0	1.2	0.0	4.3
Prop In Lane	1.00		0.00	1.00		0.06	0.25		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	1241	0	0	1271	164	0	0	213	0	137
V/C Ratio(X)	0.31	0.00	0.45	0.00	0.00	0.42	0.05	0.00	0.00	0.12	0.00	0.63
Avail Cap(c_a), veh/h	263	0	1342	0	0	1271	339	0	0	402	0	350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	8.3	0.0	0.0	6.2	38.8	0.0	0.0	38.8	0.0	40.4
Incr Delay (d2), s/veh	0.3	0.0	1.2	0.0	0.0	1.0	0.0	0.0	0.0	0.1	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.0	0.0	0.0	4.0	0.2	0.0	0.0	0.5	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	9.5	0.0	0.0	7.3	38.8	0.0	0.0	38.9	0.0	42.1
LnGrp LOS	C	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h		618			540			8			112	
Approach Delay, s/veh		11.0			7.3			38.8			41.4	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	62.3		12.1	11.2	66.8		12.1				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 61	* 61		* 18	8.4	47.4		* 18				
Max Q Clear Time (g_c+I1), s	2.1	15.0		6.3	2.8	13.6		6.3				
Green Ext Time (p_c), s	0.0	2.4		0.1	0.0	2.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay 12.2
HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

No-Build (2024) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	293	48	161	288	187	46	404	143	123	395	251
Future Volume (vph)	281	293	48	161	288	187	46	404	143	123	395	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00		0.97	0.99	0.99		1.00	0.98	
Frt		0.979				0.850		0.961			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1827	0	1725	1816	1544	1743	3277	0	1778	3260	0
Flt Permitted	0.950			0.311			0.950			0.950		
Satd. Flow (perm)	1761	1827	0	563	1816	1502	1721	3277	0	1771	3260	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	9		6	6		9	8		4	4		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	3%	2%
Adj. Flow (vph)	312	326	53	179	320	208	51	449	159	137	439	279
Shared Lane Traffic (%)												
Lane Group Flow (vph)	312	379	0	179	320	208	51	608	0	137	718	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	48.0	55.0		24.0	31.0	24.0	24.0	37.0		24.0	37.0	
Total Split (%)	34.3%	39.3%		17.1%	22.1%	17.1%	17.1%	26.4%		17.1%	26.4%	
Maximum Green (s)	42.1	49.1		18.4	25.1	18.1	17.8	31.3		18.1	31.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	30.1	47.2		60.6	30.6	46.0	9.5	43.9		15.4	52.5	
Actuated g/C Ratio	0.22	0.34		0.43	0.22	0.33	0.07	0.31		0.11	0.38	

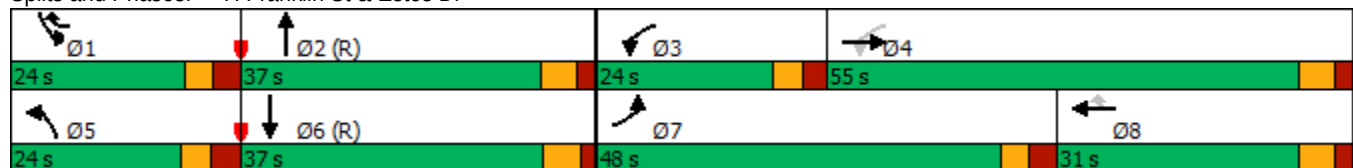
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.82	0.62		0.50	0.81	0.42	0.43	0.59		0.70	0.59	
Control Delay	69.0	42.8		26.0	68.1	34.9	73.5	45.9		78.5	40.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	69.0	42.8		26.0	68.1	34.9	73.5	45.9		78.5	40.6	
LOS	E	D		C	E	C	E	D		E	D	
Approach Delay		54.6			47.7			48.0			46.7	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	273	281		92	273	134	46	253		122	287	
Queue Length 95th (ft)	355	379		129	#429	202	90	352		192	399	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	546	667		418	398	537	236	1028		241	1221	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.57		0.43	0.80	0.39	0.22	0.59		0.57	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 108 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 49.1
Intersection Capacity Utilization 80.7%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

No-Build (2024) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	293	48	161	288	187	46	404	143	123	395	251
Future Volume (veh/h)	281	293	48	161	288	187	46	404	143	123	395	251
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1788	1788	1909	1894	1894
Adj Flow Rate, veh/h	312	326	53	179	320	208	51	449	159	137	439	279
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	3	3
Cap, veh/h	348	449	73	296	320	405	89	948	333	172	901	568
Arrive On Green	0.19	0.28	0.27	0.10	0.19	0.19	0.05	0.39	0.38	0.09	0.43	0.42
Sat Flow, veh/h	1818	1599	260	1641	1723	1439	1731	2458	862	1818	2109	1330
Grp Volume(v), veh/h	312	0	379	179	320	208	51	309	299	137	374	344
Grp Sat Flow(s),veh/h/ln	1818	0	1859	1641	1723	1439	1731	1698	1622	1818	1800	1640
Q Serve(g_s), s	23.5	0.0	25.8	10.7	26.0	17.0	4.0	19.1	19.5	10.3	21.0	21.4
Cycle Q Clear(g_c), s	23.5	0.0	25.8	10.7	26.0	17.0	4.0	19.1	19.5	10.3	21.0	21.4
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.53	1.00		0.81
Lane Grp Cap(c), veh/h	348	0	522	296	320	405	89	655	625	172	769	701
V/C Ratio(X)	0.90	0.00	0.73	0.60	1.00	0.51	0.57	0.47	0.48	0.80	0.49	0.49
Avail Cap(c_a), veh/h	559	0	664	362	320	405	235	655	625	247	769	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	0.0	45.5	33.7	57.0	42.4	64.9	32.3	32.5	62.1	29.0	29.2
Incr Delay (d2), s/veh	7.4	0.0	1.9	0.7	50.3	0.5	2.1	2.4	2.6	6.9	2.2	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	0.0	12.1	4.3	15.7	6.1	1.8	8.3	8.1	5.1	9.5	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.7	0.0	47.4	34.4	107.3	42.9	67.0	34.7	35.2	69.0	31.2	31.7
LnGrp LOS	E	A	D	C	F	D	E	C	D	E	C	C
Approach Vol, veh/h		691			707			659			855	
Approach Delay, s/veh		54.3			69.9			37.4			37.4	
Approach LOS		D			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.2	59.0	18.4	44.3	12.2	65.0	31.8	31.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	18.1	* 31	18.4	49.1	* 18	* 32	42.1	25.1				
Max Q Clear Time (g_c+I1), s	12.3	21.5	12.7	27.8	6.0	23.4	25.5	28.0				
Green Ext Time (p_c), s	0.1	1.8	0.1	1.4	0.0	2.0	0.4	0.0				

Intersection Summary

HCM 6th Ctrl Delay	49.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

No-Build (2024) PM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	60	23	1341	817	5
Future Volume (vph)	32	60	23	1341	817	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1538	1656	3539	3502	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1538	1656	3539	3502	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	12		4			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	5%	9%	2%	3%	2%
Adj. Flow (vph)	36	67	26	1490	908	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	67	26	1490	914	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.1%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

No-Build (2024) PM
12/23/2020

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	60	23	1341	817	5
Future Vol, veh/h	32	60	23	1341	817	5
Conflicting Peds, #/hr	12	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	5	9	2	3	2
Mvmt Flow	36	67	26	1490	908	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1724	461	918
Stage 1	915	-	-
Stage 2	809	-	-
Critical Hdwy	6.84	7	4.28
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.35	2.29
Pot Cap-1 Maneuver	80	539	697
Stage 1	351	-	-
Stage 2	398	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	76	537	694
Mov Cap-2 Maneuver	201	-	-
Stage 1	337	-	-
Stage 2	396	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	694	-	201	537	-	-
HCM Lane V/C Ratio	0.037	-	0.177	0.124	-	-
HCM Control Delay (s)	10.4	-	26.7	12.7	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	240	249	57	186	308	446	67	1119	247	258	671	206
Future Volume (vph)	240	249	57	186	308	446	67	1119	247	258	671	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		300	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.96			
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3416	1853	1575	1761	3522	1575	1787	3540	1599
Flt Permitted	0.150			0.950			0.284			0.077		
Satd. Flow (perm)	279	1863	1583	3416	1853	1575	526	3522	1509	145	3540	1599
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			941			1063			453	
Travel Time (s)		24.4			18.3			20.7			8.8	
Confl. Peds. (#/hr)									9	9		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	267	277	63	207	342	496	74	1243	274	287	746	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	277	63	207	342	496	74	1243	274	287	746	229
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	23.0	37.9	12.8	18.1	33.0	27.0	12.8	57.0	18.1	27.0	71.2	23.0
Total Split (%)	16.4%	27.1%	9.1%	12.9%	23.6%	19.3%	9.1%	40.7%	12.9%	19.3%	50.9%	16.4%
Maximum Green (s)	18.1	32.4	7.0	12.7	27.5	21.2	7.0	51.0	12.7	21.2	65.2	18.1
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	0.0	-0.8	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.0	5.0	4.9
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	45.1	33.6	46.4	11.5	27.2	49.9	74.9	52.2	62.9	74.9	67.1	90.1
Actuated g/C Ratio	0.32	0.24	0.33	0.08	0.19	0.36	0.54	0.37	0.45	0.54	0.48	0.64

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.95	0.62	0.12	0.74	0.95	0.88	0.21	0.95	0.40	0.84	0.44	0.22
Control Delay	81.6	54.7	33.6	78.4	92.2	47.7	15.4	57.7	15.0	62.6	16.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.6	54.7	33.6	78.4	92.2	47.7	15.4	57.7	15.0	62.6	16.5	9.1
LOS	F	D	C	E	F	D	B	E	B	E	B	A
Approach Delay		64.3			68.3			48.4			25.6	
Approach LOS		E			E			D			C	
Queue Length 50th (ft)	189	227	40	95	309	282	29	575	88	206	259	97
Queue Length 95th (ft)	#366	329	77	139	#493	#466	54	#724	126	#367	242	80
Internal Link Dist (ft)		1171			861			983			373	
Turn Bay Length (ft)	225		350	300		300	150		250	225		175
Base Capacity (vph)	281	446	523	319	370	561	349	1313	701	343	1696	1029
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.62	0.12	0.65	0.92	0.88	0.21	0.95	0.39	0.84	0.44	0.22

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 16 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 48.8
 Intersection Capacity Utilization 91.4%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr

														
Ø2 (R)			Ø1			Ø3			Ø4					
57 s			27 s			18.1 s			37.9 s					
														
Ø5	Ø6 (R)					Ø7			Ø8					
12.8 s	71.2 s					23 s			33 s					

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

No-Build (2024) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	249	57	186	308	446	67	1119	247	258	671	206
Future Volume (veh/h)	240	249	57	186	308	446	67	1119	247	258	671	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1864	1864	1864	1864	1864	1864	1949	1934	1949
Adj Flow Rate, veh/h	267	277	63	207	342	496	74	1243	274	287	746	229
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	2
Cap, veh/h	290	468	484	263	370	570	409	1306	680	358	1754	983
Arrive On Green	0.13	0.25	0.25	0.08	0.20	0.20	0.05	0.37	0.36	0.32	0.95	0.94
Sat Flow, veh/h	1781	1870	1585	3445	1864	1580	1776	3542	1560	1856	3674	1636
Grp Volume(v), veh/h	267	277	63	207	342	496	74	1243	274	287	746	229
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1722	1864	1580	1776	1771	1560	1856	1837	1636
Q Serve(g_s), s	16.7	18.2	4.0	8.3	25.2	13.3	2.9	47.8	8.5	14.7	2.2	1.2
Cycle Q Clear(g_c), s	16.7	18.2	4.0	8.3	25.2	13.3	2.9	47.8	8.5	14.7	2.2	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	468	484	263	370	570	409	1306	680	358	1754	983
V/C Ratio(X)	0.92	0.59	0.13	0.79	0.92	0.87	0.18	0.95	0.40	0.80	0.43	0.23
Avail Cap(c_a), veh/h	290	468	484	322	373	572	414	1316	685	358	1754	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	46.2	35.2	63.5	55.1	20.4	16.2	43.0	10.2	43.3	1.7	1.3
Incr Delay (d2), s/veh	32.6	1.4	0.0	7.9	27.8	13.1	0.1	15.7	1.8	11.5	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	8.6	1.6	3.9	14.6	11.0	1.2	23.4	3.0	8.6	0.8	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.0	47.5	35.2	71.4	82.9	33.5	16.3	58.7	12.0	54.8	2.5	1.8
LnGrp LOS	E	D	D	E	F	C	B	E	B	D	A	A
Approach Vol, veh/h		607			1045			1591			1262	
Approach Delay, s/veh		57.4			57.2			48.7			14.3	
Approach LOS		E			E			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.6	56.6	15.7	40.1	12.4	71.8	23.0	32.8				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 21	* 51	12.7	32.4	* 7	* 65	* 18	27.5				
Max Q Clear Time (g_c+I1), s	16.7	49.8	10.3	20.2	4.9	4.2	18.7	27.2				
Green Ext Time (p_c), s	0.1	0.8	0.0	0.5	0.0	4.1	0.0	0.1				

Intersection Summary

HCM 6th Ctrl Delay	42.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

No-Build (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	24	7	27	104	1	34	14	1618	141	45	1032	18
Future Volume (vph)	24	7	27	104	1	34	14	1618	141	45	1032	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00				
Frt		0.882			0.854			0.988			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1643	0	3364	1488	0	1778	3503	0	1770	3529	0
Flt Permitted	0.950			0.950			0.217			0.072		
Satd. Flow (perm)	1736	1643	0	3364	1488	0	406	3503	0	134	3529	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1061			2618	
Travel Time (s)		18.9			12.9			20.7			51.0	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	27	8	30	116	1	38	16	1798	157	50	1147	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	38	0	116	39	0	16	1955	0	50	1167	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	21.0	21.0		26.0	26.0		93.0	93.0		93.0	93.0	
Total Split (%)	15.0%	15.0%		18.6%	18.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	15.4	15.4		20.1	20.1		87.2	87.2		87.5	87.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

No-Build (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	8.4	8.4		9.5	9.5		109.6	109.6		109.6	109.6	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.78	0.78		0.78	0.78	
v/c Ratio	0.26	0.39		0.51	0.39		0.05	0.71		0.48	0.42	
Control Delay	68.6	74.4		70.7	73.3		3.2	5.2		28.7	7.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.6	74.4		70.7	73.3		3.2	5.2		28.7	7.5	
LOS	E	E		E	E		A	A		C	A	
Approach Delay		72.0			71.3			5.2			8.3	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	24	34		53	35		2	153		21	369	
Queue Length 95th (ft)	56	72		85	73		m2	m270		#61	35	
Internal Link Dist (ft)		474			583			981			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	198	187		504	223		317	2742		104	2762	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.20		0.23	0.17		0.05	0.71		0.48	0.42	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 133 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 10.6
Intersection Capacity Utilization 67.2%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

					
Ø2 (R)			Ø3		Ø4
93 s			26 s		21 s
					
Ø6 (R)					
93 s					

HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	0	186	2	2	1	260	1400	0	7	886	195
Future Volume (vph)	207	0	186	2	2	1	260	1400	0	7	886	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.97	0.95		0.98	1.00					0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1748	1748	1647	1664	1752	1567	3433	3539	0	1770	3539	1583
Flt Permitted	0.950	0.950		0.950			0.950			0.113		
Satd. Flow (perm)	1743	1743	1597	1575	1752	1543	3430	3539	0	210	3539	1561
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		21	21		2	2		25	25		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	230	0	207	2	2	1	289	1556	0	8	984	217
Shared Lane Traffic (%)	50%			10%								
Lane Group Flow (vph)	115	115	207	2	2	1	289	1556	0	8	984	217
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	29.0	19.0	19.0	16.0	29.0	75.0		16.0	62.0	30.0
Total Split (%)	21.4%	21.4%	20.7%	13.6%	13.6%	11.4%	20.7%	53.6%		11.4%	44.3%	21.4%
Maximum Green (s)	22.9	22.9	22.7	12.1	12.1	9.6	22.7	69.0		9.6	55.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	
Pedestrian Calls (#/hr)								0			0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	14.7	14.7	44.9	8.9	8.9	10.2	30.2	107.1		110.5	77.3	92.0
Actuated g/C Ratio	0.10	0.10	0.32	0.06	0.06	0.07	0.22	0.76		0.79	0.55	0.66
v/c Ratio	0.63	0.63	0.40	0.02	0.02	0.01	0.39	0.57		0.03	0.50	0.21
Control Delay	74.4	74.4	32.8	62.0	62.0	45.0	41.3	8.1		5.1	21.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	74.4	74.4	32.8	62.0	62.0	45.0	41.3	8.1		5.1	21.8	8.9
LOS	E	E	C	E	E	D	D	A		A	C	A
Approach Delay		54.7			58.6			13.3			19.3	
Approach LOS		D			E			B			B	
Queue Length 50th (ft)	107	107	128	2	2	1	82	140		1	300	71
Queue Length 95th (ft)	170	170	176	11	11	5	158	488		8	403	110
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	312	312	523	166	175	143	741	2708		289	1953	1084
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.37	0.37	0.40	0.01	0.01	0.01	0.39	0.57		0.03	0.50	0.20

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 71 (51%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 20.6

Intersection LOS: C

Intersection Capacity Utilization 69.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

 Ø1	 Ø2 (R)	 Ø3	 Ø4
16 s	75 s	19 s	30 s
 Ø6 (R)	 Ø5		
62 s	29 s		

HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	746	888	24	25	23
Future Volume (vph)	16	746	888	24	25	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.935	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1752	1844	1846	0	1741	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1752	1844	1846	0	1741	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		630	840		813	
Travel Time (s)		12.3	16.4		22.2	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	829	987	27	28	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	829	1014	0	54	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 58.5%
Analysis Period (min) 15

ICU Level of Service B

Intersection

Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	746	888	24	25	23
Future Vol, veh/h	16	746	888	24	25	23
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	829	987	27	28	26

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1014	0	0 1866 1002
Stage 1	-	-	- 1001 -
Stage 2	-	-	- 865 -
Critical Hdwy	4.12	-	- 5.42 5.72
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	684	-	- 134 338
Stage 1	-	-	- 469 -
Stage 2	-	-	- 524 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	684	-	- 131 338
Mov Cap-2 Maneuver	-	-	- 131 -
Stage 1	-	-	- 457 -
Stage 2	-	-	- 524 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	32.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	684	-	-	-	185
HCM Lane V/C Ratio	0.026	-	-	-	0.288
HCM Control Delay (s)	10.4	-	-	-	32.2
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

No-Build (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	646	7	2	736	50	2	3	1	36	3	170
Future Volume (vph)	117	646	7	2	736	50	2	3	1	36	3	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			0.99		0.99	0.96	
Frt		0.998			0.990			0.977			0.852	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1787	1877	0	1770	1841	0	0	1719	0	1814	1566	0
Flt Permitted	0.154			0.325				0.911		0.754		
Satd. Flow (perm)	290	1877	0	605	1841	0	0	1585	0	1422	1566	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	2		2	2		2	6		4	4		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	130	718	8	2	818	56	2	3	1	40	3	189
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	726	0	2	874	0	0	6	0	40	192	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	12.6	69.0		69.0	56.4		21.0	21.0		21.0	21.0	
Total Split (%)	14.0%	76.7%		76.7%	62.7%		23.3%	23.3%		23.3%	23.3%	
Maximum Green (s)	7.0	63.4		63.4	50.8		16.1	16.1		15.6	15.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	61.3	66.3		66.3	53.7			8.7		13.7	13.7	
Actuated g/C Ratio	0.68	0.74		0.74	0.60			0.10		0.15	0.15	
v/c Ratio	0.40	0.53		0.00	0.80			0.04		0.19	0.81	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.9	7.2		4.0	21.8			34.8		34.2	61.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	7.9	7.2		4.0	21.8			34.8		34.2	61.5	
LOS	A	A		A	C			C		C	E	
Approach Delay		7.3			21.7			34.8			56.8	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	19	158		0	368			3		20	105	
Queue Length 95th (ft)	36	244		2	#588			14		48	#195	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	323	1382		445	1097			281		252	278	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.40	0.53		0.00	0.80			0.02		0.16	0.69	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 19.6
 Intersection Capacity Utilization 72.3%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

No-Build (2024) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	646	7	2	736	50	2	3	1	36	3	170
Future Volume (veh/h)	117	646	7	2	736	50	2	3	1	36	3	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	130	718	8	2	818	56	2	3	1	40	3	189
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	1104	12	290	1056	72	66	70	16	241	4	239
Arrive On Green	0.08	0.57	0.57	0.12	0.61	0.60	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1856	1923	21	1781	1730	118	90	515	121	1540	27	1691
Grp Volume(v), veh/h	130	0	726	2	0	874	6	0	0	40	0	192
Grp Sat Flow(s),veh/h/ln	1856	0	1945	1781	0	1849	726	0	0	1540	0	1718
Q Serve(g_s), s	2.1	0.0	22.8	0.1	0.0	31.5	0.0	0.0	0.0	0.0	0.0	9.7
Cycle Q Clear(g_c), s	2.1	0.0	22.8	0.1	0.0	31.5	9.8	0.0	0.0	3.2	0.0	9.7
Prop In Lane	1.00		0.01	1.00		0.06	0.33		0.17	1.00		0.98
Lane Grp Cap(c), veh/h	231	0	1116	0	0	1128	153	0	0	241	0	243
V/C Ratio(X)	0.56	0.00	0.65	0.00	0.00	0.77	0.04	0.00	0.00	0.17	0.00	0.79
Avail Cap(c_a), veh/h	237	0	1383	0	0	1128	207	0	0	297	0	305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	13.0	0.0	0.0	13.0	33.9	0.0	0.0	34.5	0.0	37.5
Incr Delay (d2), s/veh	1.7	0.0	2.9	0.0	0.0	5.2	0.0	0.0	0.0	0.1	0.0	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	9.7	0.0	0.0	12.6	0.1	0.0	0.0	0.8	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	0.0	16.0	0.0	0.0	18.2	33.9	0.0	0.0	34.6	0.0	45.7
LnGrp LOS	C	A	B	A	A	B	C	A	A	C	A	D
Approach Vol, veh/h		856			876			6			232	
Approach Delay, s/veh		17.9			18.1			33.9			43.8	
Approach LOS		B			B			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	56.7		17.7	12.3	59.9		17.7				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 63	* 63		* 16	7.0	50.8		* 16				
Max Q Clear Time (g_c+I1), s	2.1	24.8		11.7	4.1	33.5		11.8				
Green Ext Time (p_c), s	0.0	3.4		0.2	0.0	4.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	21.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

No-Build (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	365	60	191	332	249	56	751	191	120	564	435
Future Volume (vph)	334	365	60	191	332	249	56	751	191	120	564	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00				0.97	0.98	0.99		0.99	0.96	
Frt		0.979				0.850		0.970			0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1824	0	1725	1816	1544	1743	3339	0	1761	3197	0
Flt Permitted	0.950			0.195			0.950			0.950		
Satd. Flow (perm)	1763	1824	0	354	1816	1503	1717	3339	0	1744	3197	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	8		13	13		8	15		17	17		15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	371	406	67	212	369	277	62	834	212	133	627	483
Shared Lane Traffic (%)												
Lane Group Flow (vph)	371	473	0	212	369	277	62	1046	0	133	1110	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	40.0	48.0		20.0	33.0	20.0	15.0	57.0		20.0	62.0	
Total Split (%)	26.7%	32.0%		13.3%	22.0%	13.3%	10.0%	38.0%		13.3%	41.3%	
Maximum Green (s)	34.1	42.1		14.4	27.1	14.1	8.8	51.3		14.1	56.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	33.6	50.7		65.0	31.3	45.5	9.3	50.9		14.1	58.4	
Actuated g/C Ratio	0.22	0.34		0.43	0.21	0.30	0.06	0.34		0.09	0.39	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.93	0.77		0.75	0.98	0.60	0.57	0.92		0.80	0.89	
Control Delay	87.5	54.8		42.9	98.6	48.2	89.3	61.4		98.5	53.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	87.5	54.8		42.9	98.6	48.2	89.3	61.4		98.5	53.4	
LOS	F	D		D	F	D	F	E		F	D	
Approach Delay		69.2			68.6			63.0			58.2	
Approach LOS		E			E			E			E	
Queue Length 50th (ft)	355	426		128	~405	225	60	512		129	541	
Queue Length 95th (ft)	#539	571		#193	#614	324	113	#637		#233	#675	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	414	616		291	378	468	116	1157		176	1244	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.90	0.77		0.73	0.98	0.59	0.53	0.90		0.76	0.89	

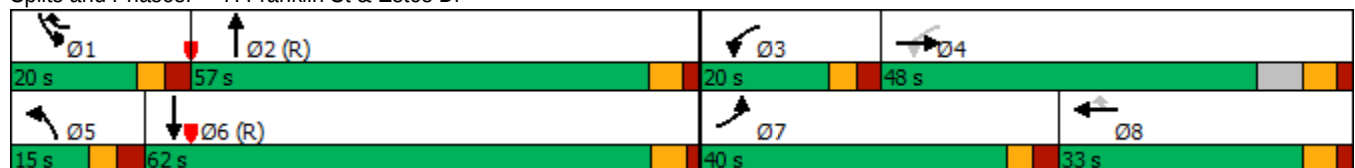
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 104 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 64.0
Intersection Capacity Utilization 89.5%
Analysis Period (min) 15
Intersection LOS: E
ICU Level of Service E

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

No-Build (2024) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	334	365	60	191	332	249	56	751	191	120	564	435
Future Volume (veh/h)	334	365	60	191	332	249	56	751	191	120	564	435
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1817	1817	1894	1909	1909
Adj Flow Rate, veh/h	371	406	67	212	369	277	62	834	212	133	627	483
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	2	2
Cap, veh/h	400	489	81	270	322	400	92	999	254	165	784	602
Arrive On Green	0.22	0.31	0.30	0.10	0.19	0.19	0.05	0.37	0.36	0.09	0.41	0.40
Sat Flow, veh/h	1818	1595	263	1641	1723	1430	1731	2711	689	1804	1933	1485
Grp Volume(v), veh/h	371	0	473	212	369	277	62	531	515	133	588	522
Grp Sat Flow(s),veh/h/ln	1818	0	1858	1641	1723	1430	1731	1726	1674	1804	1814	1604
Q Serve(g_s), s	30.0	0.0	35.5	13.2	28.0	26.0	5.3	42.1	42.1	10.8	42.8	43.1
Cycle Q Clear(g_c), s	30.0	0.0	35.5	13.2	28.0	26.0	5.3	42.1	42.1	10.8	42.8	43.1
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.41	1.00		0.93
Lane Grp Cap(c), veh/h	400	0	570	270	322	400	92	636	617	165	736	651
V/C Ratio(X)	0.93	0.00	0.83	0.79	1.15	0.69	0.68	0.83	0.84	0.81	0.80	0.80
Avail Cap(c_a), veh/h	424	0	570	270	322	400	115	636	617	180	736	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.3	0.0	48.4	36.1	61.0	48.5	69.8	43.2	43.4	66.8	39.2	39.5
Incr Delay (d2), s/veh	24.9	0.0	9.4	13.0	96.3	4.2	5.9	12.3	12.7	19.2	8.9	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.5	0.0	17.9	6.2	20.8	9.7	2.5	20.0	19.5	5.9	20.7	18.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.1	0.0	57.8	49.1	157.3	52.7	75.7	55.5	56.0	86.1	48.1	49.6
LnGrp LOS	F	A	E	D	F	D	E	E	E	F	D	D
Approach Vol, veh/h		844			858			1108			1243	
Approach Delay, s/veh		68.5			96.8			56.9			52.8	
Approach LOS		E			F			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.7	60.2	20.0	51.0	12.9	66.0	38.0	33.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 51	14.4	42.1	* 8.8	* 57	34.1	27.1				
Max Q Clear Time (g_c+I1), s	12.8	44.1	15.2	37.5	7.3	45.1	32.0	30.0				
Green Ext Time (p_c), s	0.0	2.7	0.0	0.8	0.0	4.0	0.2	0.0				

Intersection Summary

HCM 6th Ctrl Delay	66.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Build (2024) AM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	4	100	81	616	1127	120
Future Volume (vph)	4	100	81	616	1127	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.986	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1509	1719	3343	3429	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1509	1719	3343	3429	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	8		2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	7%	5%	8%	4%	2%
Adj. Flow (vph)	4	111	90	684	1252	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	111	90	684	1385	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.8%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Build (2024) AM
12/23/2020

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	100	81	616	1127	120
Future Vol, veh/h	4	100	81	616	1127	120
Conflicting Peds, #/hr	8	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	7	5	8	4	2
Mvmt Flow	4	111	90	684	1252	133

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1851	695	1387
Stage 1	1321	-	-
Stage 2	530	-	-
Critical Hdwy	6.84	7.04	4.2
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.37	2.25
Pot Cap-1 Maneuver	66	373	474
Stage 1	214	-	-
Stage 2	555	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	53	372	473
Mov Cap-2 Maneuver	137	-	-
Stage 1	173	-	-
Stage 2	554	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.2	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	473	-	137	372	-	-
HCM Lane V/C Ratio	0.19	-	0.032	0.299	-	-
HCM Control Delay (s)	14.4	-	32.2	18.7	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	1.2	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	308	82	185	156	241	35	460	127	402	984	227
Future Volume (vph)	275	308	82	185	156	241	35	460	127	402	984	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		300	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3383	1818	1545	1761	3326	1545	1787	3506	1584
Flt Permitted	0.391			0.950			0.154			0.347		
Satd. Flow (perm)	728	1863	1583	3383	1818	1545	285	3326	1504	651	3506	1584
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			906			1063			488	
Travel Time (s)		24.4			17.6			20.7			9.5	
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	4%	4%	2%	8%	4%	2%	4%	3%
Adj. Flow (vph)	306	342	91	206	173	268	39	511	141	447	1093	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	306	342	91	206	173	268	39	511	141	447	1093	252
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	27.1	39.0	12.9	17.0	28.9	38.0	12.9	36.0	17.0	38.0	61.1	27.1
Total Split (%)	20.8%	30.0%	9.9%	13.1%	22.2%	29.2%	9.9%	27.7%	13.1%	29.2%	47.0%	20.8%
Maximum Green (s)	22.2	33.5	7.1	11.6	23.4	32.2	7.1	30.0	11.6	32.2	55.1	22.2
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	0.0	-0.8	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.0	5.0	4.9
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	38.4	27.4	40.2	11.0	18.0	47.8	71.6	41.8	52.0	71.6	63.8	89.3
Actuated g/C Ratio	0.30	0.21	0.31	0.08	0.14	0.37	0.55	0.32	0.40	0.55	0.49	0.69

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) AM
12/23/2020

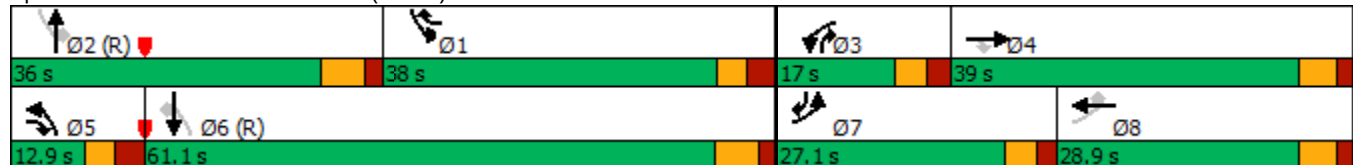
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.81	0.87	0.19	0.72	0.69	0.47	0.16	0.48	0.23	0.72	0.64	0.23
Control Delay	51.4	71.5	32.4	72.3	67.0	19.0	15.0	39.7	15.4	30.9	24.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	71.5	32.4	72.3	67.0	19.0	15.0	39.7	15.4	30.9	24.5	6.4
LOS	D	E	C	E	E	B	B	D	B	C	C	A
Approach Delay		58.4			48.8			33.4			23.5	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)	204	279	56	88	141	97	14	187	39	150	247	41
Queue Length 95th (ft)	272	373	94	130	209	118	34	267	68	299	435	89
Internal Link Dist (ft)		1171			826			983			408	
Turn Bay Length (ft)	225		350	300		300	150		250	225		175
Base Capacity (vph)	404	487	490	318	334	608	247	1068	619	665	1720	1113
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.19	0.65	0.52	0.44	0.16	0.48	0.23	0.67	0.64	0.23

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 84 (65%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 36.2
Intersection Capacity Utilization 85.7%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service E

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	308	82	185	156	241	35	460	127	402	984	227
Future Volume (veh/h)	275	308	82	185	156	241	35	460	127	402	984	227
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1850	1835	1835	1864	1776	1835	1949	1919	1934
Adj Flow Rate, veh/h	306	342	91	206	173	268	39	511	141	447	1093	252
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	3	4	4	2	8	4	2	4	3
Cap, veh/h	366	377	398	266	210	770	348	629	392	790	1895	1108
Arrive On Green	0.17	0.20	0.20	0.08	0.11	0.12	0.05	0.19	0.18	0.76	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	3417	1835	1555	1776	3374	1542	1856	3645	1634
Grp Volume(v), veh/h	306	342	91	206	173	268	39	511	141	447	1093	252
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1709	1835	1555	1776	1687	1542	1856	1823	1634
Q Serve(g_s), s	19.5	23.2	5.9	7.7	12.0	5.3	1.3	18.9	3.1	2.8	0.0	0.0
Cycle Q Clear(g_c), s	19.5	23.2	5.9	7.7	12.0	5.3	1.3	18.9	3.1	2.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	377	398	266	210	770	348	629	392	790	1895	1108
V/C Ratio(X)	0.84	0.91	0.23	0.77	0.82	0.35	0.11	0.81	0.36	0.57	0.58	0.23
Avail Cap(c_a), veh/h	375	489	492	315	337	878	373	804	472	790	1895	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	50.7	38.7	58.8	56.3	6.8	12.6	50.7	16.7	9.7	0.0	0.0
Incr Delay (d2), s/veh	13.9	15.1	0.1	7.8	3.9	0.1	0.1	11.0	2.6	0.6	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	12.4	2.3	3.6	5.7	2.2	0.5	8.9	2.1	3.5	0.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.9	65.8	38.8	66.6	60.2	6.9	12.6	61.7	19.2	10.3	1.3	0.5
LnGrp LOS	E	E	D	E	E	A	B	E	B	B	A	A
Approach Vol, veh/h		739			647			691			1792	
Approach Delay, s/veh		58.4			40.2			50.3			3.4	
Approach LOS		E			D			D			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.4	29.2	15.1	31.2	11.1	72.6	26.5	19.9				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 32	* 30	11.6	33.5	* 7.1	* 55	* 22	23.4				
Max Q Clear Time (g_c+I1), s	4.8	20.9	9.7	25.2	3.3	2.0	21.5	14.0				
Green Ext Time (p_c), s	0.2	1.8	0.0	0.5	0.0	6.7	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Build (2024) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	2	0	7	166	1	41	14	935	68	22	1471	2
Future Volume (vph)	2	0	7	166	1	41	14	935	68	22	1471	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99		1.00				1.00		1.00		
Frt		0.850			0.853			0.990				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1234	0	3332	1542	0	1499	3413	0	1641	3505	0
Flt Permitted	0.950			0.950			0.117			0.231		
Satd. Flow (perm)	1770	1234	0	3320	1542	0	185	3413	0	399	3505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1027			2618	
Travel Time (s)		18.9			12.9			20.0			51.0	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	29%	3%	2%	3%	21%	5%	6%	10%	3%	2%
Adj. Flow (vph)	2	0	8	184	1	46	16	1039	76	24	1634	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	8	0	184	47	0	16	1115	0	24	1636	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	20.0	20.0		24.0	24.0		86.0	86.0		86.0	86.0	
Total Split (%)	15.4%	15.4%		18.5%	18.5%		66.2%	66.2%		66.2%	66.2%	
Maximum Green (s)	14.4	14.4		18.1	18.1		80.2	80.2		80.5	80.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Build (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.6	7.6		11.5	11.5		103.5	103.5		103.5	103.5	
Actuated g/C Ratio	0.06	0.06		0.09	0.09		0.80	0.80		0.80	0.80	
v/c Ratio	0.02	0.11		0.63	0.35		0.11	0.41		0.08	0.59	
Control Delay	58.0	61.7		66.4	61.8		5.1	4.3		2.7	3.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.0	61.7		66.4	61.8		5.1	4.3		2.7	3.3	
LOS	E	E		E	E		A	A		A	A	
Approach Delay		61.0			65.4			4.3			3.3	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	7		78	38		3	122		2	69	
Queue Length 95th (ft)	11	24		114	77		m7	158		m2	88	
Internal Link Dist (ft)		474			583			947			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	204	142		486	225		147	2716		317	2789	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.06		0.38	0.21		0.11	0.41		0.08	0.59	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 80 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 8.6
 Intersection Capacity Utilization 60.5%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

					
Ø2 (R)	Ø3	Ø4			
86 s	24 s	20 s			
					
Ø6 (R)					
86 s					

HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	6	261	2	0	1	121	872	2	9	1224	123
Future Volume (vph)	224	6	261	2	0	1	121	872	2	9	1224	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00		1.00		0.98
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.955		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	1682	1695	1647	1664	1664	1567	3242	3468	0	1770	3505	1482
Flt Permitted	0.950	0.955		0.950	0.950		0.950			0.254		
Satd. Flow (perm)	1680	1692	1621	1646	1646	1546	3238	3468	0	473	3505	1457
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	1		4	4		1	5		1	1		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	8%	4%	50%	2%	3%	9%
Adj. Flow (vph)	249	7	290	2	0	1	134	969	2	10	1360	137
Shared Lane Traffic (%)	49%			50%								
Lane Group Flow (vph)	127	129	290	1	1	1	134	971	0	10	1360	137
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	28.0	28.0	28.0	17.0	17.0	17.0	28.0	68.0		17.0	57.0	28.0
Total Split (%)	21.5%	21.5%	21.5%	13.1%	13.1%	13.1%	21.5%	52.3%		13.1%	43.8%	21.5%
Maximum Green (s)	20.9	20.9	21.7	10.1	10.1	10.6	21.7	62.0		10.6	50.6	20.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	15.4	15.4	36.9	8.9	8.9	10.2	21.5	96.5		99.8	75.3	90.7
Actuated g/C Ratio	0.12	0.12	0.28	0.07	0.07	0.08	0.17	0.74		0.77	0.58	0.70
v/c Ratio	0.64	0.65	0.62	0.01	0.01	0.01	0.25	0.38		0.02	0.67	0.13
Control Delay	68.5	68.7	39.4	57.0	57.0	40.0	49.6	5.5		5.7	23.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.5	68.7	39.4	57.0	57.0	40.0	49.6	5.5		5.7	23.0	6.5
LOS	E	E	D	E	E	D	D	A		A	C	A
Approach Delay		53.1			51.3			10.9			21.4	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	109	110	197	1	1	1	57	21		1	384	28
Queue Length 95th (ft)	173	173	218	7	7	5	87	234		9	652	71
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	297	299	480	153	153	165	573	2573		488	2030	1069
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.43	0.43	0.60	0.01	0.01	0.01	0.23	0.38		0.02	0.67	0.13

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 39 (30%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 23.2

Intersection LOS: C

Intersection Capacity Utilization 68.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

 Ø1	 Ø2 (R)	 Ø3	 Ø4
17 s	68 s	17 s	28 s
 Ø6 (R)	 Ø5		
57 s	28 s		

HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	821	565	13	17	16
Future Volume (vph)	22	821	565	13	17	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.934	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1752	1844	1830	0	1675	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1752	1844	1830	0	1675	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		665	840		813	
Travel Time (s)		13.0	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	2%	2%	10%
Adj. Flow (vph)	24	912	628	14	19	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	912	642	0	37	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 53.2%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	821	565	13	17	16
Future Vol, veh/h	22	821	565	13	17	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	2	2	10
Mvmt Flow	24	912	628	14	19	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	642	0	0 1595 635
Stage 1	-	-	- 635 -
Stage 2	-	-	- 960 -
Critical Hdwy	4.12	-	- 5.42 5.8
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.39
Pot Cap-1 Maneuver	943	-	- 183 507
Stage 1	-	-	- 630 -
Stage 2	-	-	- 485 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	943	-	- 178 507
Mov Cap-2 Maneuver	-	-	- 178 -
Stage 1	-	-	- 614 -
Stage 2	-	-	- 485 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	21.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	943	-	-	-	260
HCM Lane V/C Ratio	0.026	-	-	-	0.141
HCM Control Delay (s)	8.9	-	-	-	21.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Build (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	741	3	1	491	33	9	9	7	44	2	131
Future Volume (vph)	185	741	3	1	491	33	9	9	7	44	2	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.98			0.92	
Frt		0.999			0.990			0.961			0.852	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1787	1879	0	1770	1806	0	0	1696	0	1814	1467	0
Flt Permitted	0.342			0.278				0.878		0.739		
Satd. Flow (perm)	643	1879	0	518	1806	0	0	1490	0	1411	1467	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	8		2	2		8	21					21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	4%
Adj. Flow (vph)	206	823	3	1	546	37	10	10	8	49	2	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	826	0	1	583	0	0	28	0	49	148	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	16.0	67.0		67.0	51.0		23.0	23.0		23.0	23.0	
Total Split (%)	17.8%	74.4%		74.4%	56.7%		25.6%	25.6%		25.6%	25.6%	
Maximum Green (s)	10.4	61.4		61.4	45.4		18.1	18.1		17.6	17.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	62.0	67.0		67.0	53.7			11.0		13.0	13.0	
Actuated g/C Ratio	0.69	0.74		0.74	0.60			0.12		0.14	0.14	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	0.59		0.00	0.54			0.15		0.24	0.70	
Control Delay	6.2	8.2		4.0	14.4			34.4		35.1	53.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	6.2	8.2		4.0	14.4			34.4		35.1	53.4	
LOS	A	A		A	B			C		D	D	
Approach Delay		7.8			14.3			34.4			48.9	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	27	174		0	177			15		25	81	
Queue Length 95th (ft)	62	349		2	341			36		54	135	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	602	1402		386	1079			301		284	296	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.34	0.59		0.00	0.54			0.09		0.17	0.50	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.7
Intersection Capacity Utilization 71.4%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Build (2024) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	741	3	1	491	33	9	9	7	44	2	131
Future Volume (veh/h)	185	741	3	1	491	33	9	9	7	44	2	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.96		0.92	0.95		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1841	1841	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	206	823	3	1	546	37	10	10	8	49	2	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	4	4	2	2	2	2	2	2
Cap, veh/h	253	1119	4	290	1024	69	75	59	32	253	3	222
Arrive On Green	0.09	0.58	0.57	0.12	0.60	0.59	0.13	0.13	0.13	0.14	0.14	0.13
Sat Flow, veh/h	1856	1940	7	1781	1704	115	155	445	240	1463	22	1597
Grp Volume(v), veh/h	206	0	826	1	0	583	28	0	0	49	0	148
Grp Sat Flow(s),veh/h/ln	1856	0	1947	1781	0	1819	841	0	0	1463	0	1619
Q Serve(g_s), s	5.8	0.0	28.1	0.1	0.0	16.9	0.1	0.0	0.0	0.0	0.0	7.8
Cycle Q Clear(g_c), s	5.8	0.0	28.1	0.1	0.0	16.9	7.9	0.0	0.0	3.5	0.0	7.8
Prop In Lane	1.00		0.00	1.00		0.06	0.36		0.29	1.00		0.99
Lane Grp Cap(c), veh/h	253	0	1123	0	0	1094	167	0	0	253	0	225
V/C Ratio(X)	0.81	0.00	0.74	0.00	0.00	0.53	0.17	0.00	0.00	0.19	0.00	0.66
Avail Cap(c_a), veh/h	307	0	1341	0	0	1094	249	0	0	343	0	324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	14.0	0.0	0.0	10.5	34.6	0.0	0.0	34.9	0.0	36.9
Incr Delay (d2), s/veh	10.8	0.0	4.3	0.0	0.0	1.9	0.2	0.0	0.0	0.1	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	12.1	0.0	0.0	6.5	0.5	0.0	0.0	1.0	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	0.0	18.3	0.0	0.0	12.4	34.7	0.0	0.0	35.0	0.0	38.2
LnGrp LOS	D	A	B	A	A	B	C	A	A	D	A	D
Approach Vol, veh/h		1032			584			28			197	
Approach Delay, s/veh		23.0			12.4			34.7			37.4	
Approach LOS		C			B			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	56.9		17.5	13.4	59.1		17.5				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 61	* 61		* 18	10.4	45.4		* 18				
Max Q Clear Time (g_c+I1), s	2.1	30.1		9.8	7.8	18.9		9.9				
Green Ext Time (p_c), s	0.0	4.1		0.2	0.0	2.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	369	64	106	223	112	52	366	83	94	555	262
Future Volume (vph)	380	369	64	106	223	112	52	366	83	94	555	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00				0.98	0.99	1.00		1.00	0.98	
Frt		0.978				0.850		0.972			0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1827	0	1692	1748	1514	1743	3294	0	1711	3293	0
Flt Permitted	0.950			0.232			0.950			0.950		
Satd. Flow (perm)	1765	1827	0	413	1748	1480	1725	3294	0	1708	3293	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	7		3	3		7	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	4%	6%	4%	2%	5%	2%	6%	3%	3%
Adj. Flow (vph)	422	410	71	118	248	124	58	407	92	104	617	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	422	481	0	118	248	124	58	499	0	104	908	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	35.0	35.0		35.0	35.0	20.0	20.0	40.0		20.0	40.0	
Total Split (%)	26.9%	26.9%		26.9%	26.9%	15.4%	15.4%	30.8%		15.4%	30.8%	
Maximum Green (s)	29.1	29.1		29.4	29.1	14.1	13.8	34.3		14.1	34.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	30.0	47.8		57.9	27.9	40.4	9.7	39.6		12.5	45.0	
Actuated g/C Ratio	0.23	0.37		0.45	0.21	0.31	0.07	0.30		0.10	0.35	

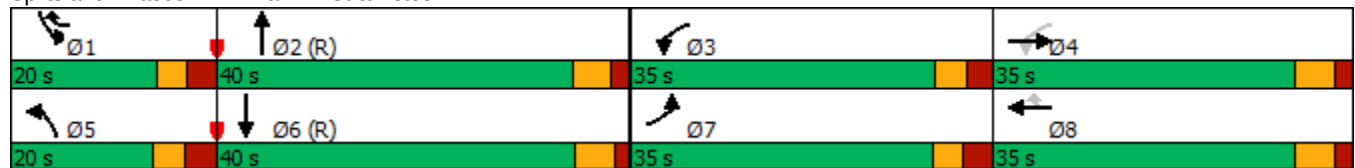
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.03	0.72		0.42	0.66	0.27	0.45	0.50		0.63	0.80	
Control Delay	101.0	43.0		23.4	56.3	31.2	68.1	39.7		73.6	45.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	101.0	43.0		23.4	56.3	31.2	68.1	39.7		73.6	45.5	
LOS	F	D		C	E	C	E	D		E	D	
Approach Delay		70.1			42.0			42.7			48.4	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	~380	355		56	197	75	48	177		85	360	
Queue Length 95th (ft)	#586	484		88	282	117	93	250		146	#534	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	410	671		495	403	493	201	1003		198	1140	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.03	0.72		0.24	0.62	0.25	0.29	0.50		0.53	0.80	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 124 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 52.9
 Intersection Capacity Utilization 82.2%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	369	64	106	223	112	52	366	83	94	555	262
Future Volume (veh/h)	380	369	64	106	223	112	52	366	83	94	555	262
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1693	1664	1693	1817	1773	1773	1849	1894	1894
Adj Flow Rate, veh/h	422	410	71	118	248	124	58	407	92	104	617	291
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	4	6	4	2	5	5	6	3	3
Cap, veh/h	420	541	94	254	296	366	98	978	219	139	896	423
Arrive On Green	0.23	0.34	0.33	0.07	0.18	0.18	0.06	0.36	0.35	0.08	0.38	0.38
Sat Flow, veh/h	1818	1584	274	1613	1664	1418	1731	2727	610	1761	2363	1114
Grp Volume(v), veh/h	422	0	481	118	248	124	58	250	249	104	470	438
Grp Sat Flow(s),veh/h/ln	1818	0	1858	1613	1664	1418	1731	1684	1654	1761	1800	1678
Q Serve(g_s), s	30.0	0.0	29.9	6.1	18.7	9.3	4.3	14.5	14.8	7.5	28.5	28.6
Cycle Q Clear(g_c), s	30.0	0.0	29.9	6.1	18.7	9.3	4.3	14.5	14.8	7.5	28.5	28.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.37	1.00		0.66
Lane Grp Cap(c), veh/h	420	0	635	254	296	366	98	604	593	139	683	636
V/C Ratio(X)	1.01	0.00	0.76	0.46	0.84	0.34	0.59	0.41	0.42	0.75	0.69	0.69
Avail Cap(c_a), veh/h	420	0	635	518	384	440	200	604	593	203	683	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	0.0	38.0	28.7	51.6	39.3	59.9	31.4	31.6	58.6	33.9	34.1
Incr Delay (d2), s/veh	45.3	0.0	4.7	0.5	9.6	0.2	2.1	2.1	2.2	3.8	5.6	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.7	0.0	14.3	2.4	8.5	3.2	1.9	6.2	6.3	3.5	13.3	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.3	0.0	42.7	29.2	61.2	39.5	62.0	33.5	33.8	62.5	39.5	40.1
LnGrp LOS	F	A	D	C	E	D	E	C	C	E	D	D
Approach Vol, veh/h		903			490			557			1012	
Approach Delay, s/veh		67.3			48.0			36.6			42.1	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	51.6	13.7	49.4	12.3	54.5	35.0	28.2				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 34	29.4	29.1	* 14	* 35	29.1	29.1				
Max Q Clear Time (g_c+I1), s	9.5	16.8	8.1	31.9	6.3	30.6	32.0	20.7				
Green Ext Time (p_c), s	0.0	1.7	0.1	0.0	0.0	1.5	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay 49.7
HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	44	963	14	0	1613
Future Volume (vph)	0	44	963	14	0	1613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			-2%
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1611	3550	0	0	3575
Flt Permitted						
Satd. Flow (perm)	0	1611	3550	0	0	3575
Link Speed (mph)	25		35			35
Link Distance (ft)	569		488			1027
Travel Time (s)	15.5		9.5			20.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	49	1070	16	0	1792
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	49	1086	0	0	1792
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.9%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	44	963	14	0	1613
Future Vol, veh/h	0	44	963	14	0	1613
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	-1	-	-	-2
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	49	1070	16	0	1792

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	543	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	484	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	484	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 484	-
HCM Lane V/C Ratio	-	- 0.101	-
HCM Control Delay (s)	-	- 13.3	-
HCM Lane LOS	-	- B	-
HCM 95th %tile Q(veh)	-	- 0.3	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	803	550	33	53	32
Future Volume (vph)	34	803	550	33	53	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.992		0.949	
Flt Protected		0.998			0.970	
Satd. Flow (prot)	0	1859	1848	0	1715	0
Flt Permitted		0.998			0.970	
Satd. Flow (perm)	0	1859	1848	0	1715	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		906	665		381	
Travel Time (s)		17.6	13.0		10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	892	611	37	59	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	930	648	0	95	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 81.4%
Analysis Period (min) 15

ICU Level of Service D

Intersection

Int Delay, s/veh	3.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	803	550	33	53	32
Future Vol, veh/h	34	803	550	33	53	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	892	611	37	59	36

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	648	0	0 1598 630
Stage 1	-	-	- 630 -
Stage 2	-	-	- 968 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	938	-	- 117 482
Stage 1	-	-	- 531 -
Stage 2	-	-	- 368 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	938	-	- 108 482
Mov Cap-2 Maneuver	-	-	- 108 -
Stage 1	-	-	- 489 -
Stage 2	-	-	- 368 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	60.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	938	-	-	-	153
HCM Lane V/C Ratio	0.04	-	-	-	0.617
HCM Control Delay (s)	9	0	-	-	60.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	3.3

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Build (2024) Noon
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	62	80	674	627	33
Future Volume (vph)	19	62	80	674	627	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.992	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1719	1538	1752	3438	3445	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1719	1538	1752	3438	3445	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	6					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	3%	5%	4%	3%
Adj. Flow (vph)	21	69	89	749	697	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	69	89	749	734	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.1% ICU Level of Service A
Analysis Period (min) 15

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Build (2024) Noon
12/23/2020

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	62	80	674	627	33
Future Vol, veh/h	19	62	80	674	627	33
Conflicting Peds, #/hr	6	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	3	5	4	3
Mvmt Flow	21	69	89	749	697	37

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1275	367	734
Stage 1	716	-	-
Stage 2	559	-	-
Critical Hdwy	6.9	7	4.16
Critical Hdwy Stg 1	5.9	-	-
Critical Hdwy Stg 2	5.9	-	-
Follow-up Hdwy	3.55	3.35	2.23
Pot Cap-1 Maneuver	155	621	860
Stage 1	437	-	-
Stage 2	528	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	139	621	860
Mov Cap-2 Maneuver	267	-	-
Stage 1	392	-	-
Stage 2	528	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	860	-	267	621	-	-
HCM Lane V/C Ratio	0.103	-	0.079	0.111	-	-
HCM Control Delay (s)	9.7	-	19.6	11.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	181	26	164	216	236	42	475	138	269	467	164
Future Volume (vph)	178	181	26	164	216	236	42	475	138	269	467	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		300	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1495	3383	1853	1575	1604	3421	1575	1753	3440	1568
Flt Permitted	0.274			0.950			0.416			0.372		
Satd. Flow (perm)	510	1863	1495	3383	1853	1575	700	3421	1575	686	3440	1530
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			913			1063			432	
Travel Time (s)		24.4			17.8			20.7			8.4	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	8%	3%	2%	2%	12%	5%	2%	4%	6%	4%
Adj. Flow (vph)	198	201	29	182	240	262	47	528	153	299	519	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	201	29	182	240	262	47	528	153	299	519	182
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	21.0	37.0	14.0	17.0	33.0	26.0	14.0	40.0	17.0	26.0	52.0	21.0
Total Split (%)	17.5%	30.8%	11.7%	14.2%	27.5%	21.7%	11.7%	33.3%	14.2%	21.7%	43.3%	17.5%
Maximum Green (s)	16.1	31.5	8.2	11.6	27.5	20.2	8.2	34.0	11.6	20.2	46.0	16.1
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	0.0	-0.8	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.0	5.0	4.9
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	33.6	23.3	36.1	10.4	19.5	38.5	67.4	47.4	57.0	66.4	61.1	75.4
Actuated g/C Ratio	0.28	0.19	0.30	0.09	0.16	0.32	0.56	0.40	0.48	0.55	0.51	0.63

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) Noon
12/23/2020

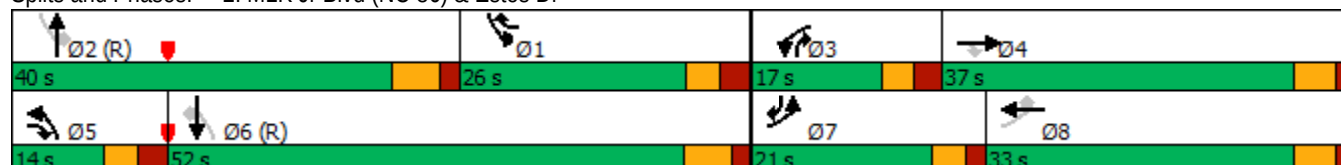
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.68	0.56	0.06	0.62	0.80	0.52	0.10	0.39	0.20	0.55	0.30	0.19
Control Delay	42.0	48.6	27.5	62.2	66.8	22.2	13.5	29.8	11.4	26.5	19.9	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	48.6	27.5	62.2	66.8	22.2	13.5	29.8	11.4	26.5	19.9	9.8
LOS	D	D	C	E	E	C	B	C	B	C	B	A
Approach Delay		44.1			48.5			24.9			20.1	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)	116	141	16	71	181	110	14	154	33	153	164	75
Queue Length 95th (ft)	157	202	36	107	255	118	39	247	69	188	235	137
Internal Link Dist (ft)		1171			833			983			352	
Turn Bay Length (ft)	225		350	300		300	150		250	225		175
Base Capacity (vph)	324	496	464	347	432	540	465	1371	773	587	1750	996
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.41	0.06	0.52	0.56	0.49	0.10	0.39	0.20	0.51	0.30	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 16 (13%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 31.8
 Intersection Capacity Utilization 65.9%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	181	26	164	216	236	42	475	138	269	467	164
Future Volume (veh/h)	178	181	26	164	216	236	42	475	138	269	467	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1781	1850	1864	1864	1716	1820	1864	1919	1889	1919
Adj Flow Rate, veh/h	198	201	29	182	240	262	47	528	153	299	519	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	8	3	2	2	12	5	2	4	6	4
Cap, veh/h	272	350	366	247	280	834	501	681	403	785	1869	1008
Arrive On Green	0.11	0.19	0.19	0.07	0.15	0.15	0.05	0.20	0.19	0.75	1.00	1.00
Sat Flow, veh/h	1781	1870	1510	3417	1864	1580	1635	3458	1559	1827	3588	1618
Grp Volume(v), veh/h	198	201	29	182	240	262	47	528	153	299	519	182
Grp Sat Flow(s),veh/h/ln	1781	1870	1510	1709	1864	1580	1635	1729	1559	1827	1794	1618
Q Serve(g_s), s	11.2	11.7	1.8	6.3	15.1	3.4	1.5	17.4	3.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.2	11.7	1.8	6.3	15.1	3.4	1.5	17.4	3.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	350	366	247	280	834	501	681	403	785	1869	1008
V/C Ratio(X)	0.73	0.57	0.08	0.74	0.86	0.31	0.09	0.78	0.38	0.38	0.28	0.18
Avail Cap(c_a), veh/h	315	499	486	342	435	965	537	1009	551	785	1869	1008
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	44.4	35.1	54.5	49.7	5.4	11.3	45.7	15.1	9.0	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.6	0.0	2.8	6.1	0.1	0.0	8.4	2.7	0.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.5	0.7	2.8	7.4	1.5	0.5	8.2	2.1	2.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	45.0	35.1	57.3	55.8	5.4	11.3	54.1	17.8	9.1	0.4	0.4
LnGrp LOS	D	D	D	E	E	A	B	D	B	A	A	A
Approach Vol, veh/h		428			684			728			1000	
Approach Delay, s/veh		43.9			36.9			43.7			3.0	
Approach LOS		D			D			D			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.2	28.6	13.7	27.5	11.3	67.5	18.1	23.0				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 20	* 34	11.6	31.5	* 8.2	* 46	* 16	27.5				
Max Q Clear Time (g_c+I1), s	2.0	19.4	8.3	13.7	3.5	2.0	13.2	17.1				
Green Ext Time (p_c), s	0.1	2.3	0.0	0.3	0.0	2.7	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay 27.8
HCM 6th LOS C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Build (2024) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	3	0	14	68	1	24	21	857	57	27	831	2
Future Volume (vph)	3	0	14	68	1	24	21	857	57	27	831	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00		1.00		
Frt		0.850			0.855			0.991				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1113	0	3364	1442	0	1463	3488	0	1770	3471	0
Flt Permitted	0.950			0.950			0.294			0.265		
Satd. Flow (perm)	1762	1113	0	3355	1442	0	453	3488	0	493	3471	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1082			2618	
Travel Time (s)		18.9			12.9			21.1			51.0	
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	43%	2%	2%	9%	24%	3%	2%	2%	4%	2%
Adj. Flow (vph)	3	0	16	76	1	27	23	952	63	30	923	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	16	0	76	28	0	23	1015	0	30	925	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	22.0	22.0		26.0	26.0		72.0	72.0		72.0	72.0	
Total Split (%)	18.3%	18.3%		21.7%	21.7%		60.0%	60.0%		60.0%	60.0%	
Maximum Green (s)	16.4	16.4		20.1	20.1		66.2	66.2		66.5	66.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Build (2024) Noon
12/23/2020

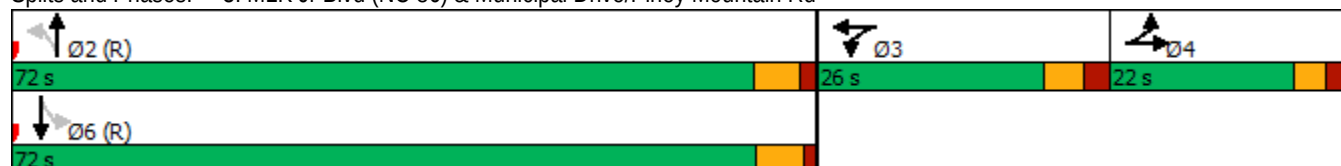
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.8	7.8		8.3	8.3		100.0	100.0		100.0	100.0	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.83	0.83		0.83	0.83	
v/c Ratio	0.03	0.22		0.33	0.29		0.06	0.35		0.07	0.32	
Control Delay	52.7	60.6		57.1	60.5		2.9	2.4		1.3	1.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.7	60.6		57.1	60.5		2.9	2.4		1.3	1.2	
LOS	D	E		E	E		A	A		A	A	
Approach Delay		59.4			58.0			2.4			1.2	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	12		29	21		1	30		2	35	
Queue Length 95th (ft)	13	36		54	52		m8	104		m4	32	
Internal Link Dist (ft)		474			583			1002			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	250	157		588	252		377	2907		411	2893	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.10		0.13	0.11		0.06	0.35		0.07	0.32	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 115 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 5.1
 Intersection Capacity Utilization 42.5%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd



HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	2	200	11	7	14	167	708	2	19	652	95
Future Volume (vph)	109	2	200	11	7	14	167	708	2	19	652	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.98	1.00	0.99	1.00	1.00		0.99		0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.954		0.950	0.990		0.950			0.950		
Satd. Flow (prot)	1667	1676	1600	1664	1734	1567	3400	3500	0	1719	3471	1495
Flt Permitted	0.950	0.954		0.950	0.990		0.950			0.321		
Satd. Flow (perm)	1662	1672	1569	1629	1727	1545	3398	3500	0	578	3471	1476
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		9	9		2	1		10	10		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	5%	2%	2%	2%	3%	3%	50%	5%	4%	8%
Adj. Flow (vph)	121	2	222	12	8	16	186	787	2	21	724	106
Shared Lane Traffic (%)	49%			18%								
Lane Group Flow (vph)	62	61	222	10	10	16	186	789	0	21	724	106
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	25.0	19.0	19.0	18.0	25.0	53.0		18.0	46.0	30.0
Total Split (%)	25.0%	25.0%	20.8%	15.8%	15.8%	15.0%	20.8%	44.2%		15.0%	38.3%	25.0%
Maximum Green (s)	22.9	22.9	18.7	12.1	12.1	11.6	18.7	47.0		11.6	39.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	10.8	10.8	27.3	8.9	8.9	12.0	16.5	85.6		90.7	72.1	82.9
Actuated g/C Ratio	0.09	0.09	0.23	0.07	0.07	0.10	0.14	0.71		0.76	0.60	0.69
v/c Ratio	0.42	0.41	0.61	0.08	0.08	0.10	0.40	0.32		0.04	0.35	0.10
Control Delay	59.7	59.2	39.5	53.4	53.3	35.6	51.2	12.1		5.1	14.5	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.7	59.2	39.5	53.4	53.3	35.6	51.2	12.1		5.1	14.5	6.7
LOS	E	E	D	D	D	D	D	B		A	B	A
Approach Delay		46.6			45.5			19.6			13.3	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	49	48	145	7	7	12	64	95		2	123	17
Queue Length 95th (ft)	94	92	170	26	26	25	112	265		13	241	54
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	347	349	398	194	202	215	566	2496		573	2086	1084
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.18	0.17	0.56	0.05	0.05	0.07	0.33	0.32		0.04	0.35	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 21.8

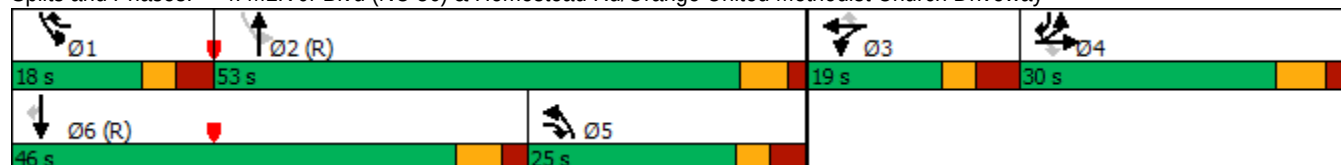
Intersection Capacity Utilization 64.2%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	580	568	19	20	20
Future Volume (vph)	25	580	568	19	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1639	1844	1837	0	1561	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1639	1844	1837	0	1561	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		658	840		813	
Travel Time (s)		12.8	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	2%	2%	18%	2%	25%
Adj. Flow (vph)	28	644	631	21	22	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	644	652	0	44	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 41.0%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	580	568	19	20	20
Future Vol, veh/h	25	580	568	19	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	2	2	18	2	25
Mvmt Flow	28	644	631	21	22	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	652	0	0 1342 642
Stage 1	-	-	- 642 -
Stage 2	-	-	- 700 -
Critical Hdwy	4.19	-	- 5.42 5.95
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.281	-	- 3.518 3.525
Pot Cap-1 Maneuver	902	-	- 244 476
Stage 1	-	-	- 626 -
Stage 2	-	-	- 598 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	902	-	- 236 476
Mov Cap-2 Maneuver	-	-	- 236 -
Stage 1	-	-	- 607 -
Stage 2	-	-	- 598 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	902	-	-	-	316
HCM Lane V/C Ratio	0.031	-	-	-	0.141
HCM Control Delay (s)	9.1	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Build (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	541	3	1	500	27	3	4	2	23	0	78
Future Volume (vph)	58	541	3	1	500	27	3	4	2	23	0	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00							
Frt		0.999			0.992			0.970			0.850	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1753	1879	0	1770	1843	0	0	1483	0	1814	1592	0
Flt Permitted	0.377			0.411				0.888		0.752		
Satd. Flow (perm)	694	1879	0	766	1843	0	0	1338	0	1436	1592	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	4%	50%	2%	2%	2%	2%	4%
Adj. Flow (vph)	64	601	3	1	556	30	3	4	2	26	0	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	604	0	1	586	0	0	9	0	26	87	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	13.0	68.0		68.0	55.0		22.0	22.0		22.0	22.0	
Total Split (%)	14.4%	75.6%		75.6%	61.1%		24.4%	24.4%		24.4%	24.4%	
Maximum Green (s)	7.4	62.4		62.4	49.4		17.1	17.1		16.6	16.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	69.1	74.1		74.1	64.0			8.1		9.4	9.4	
Actuated g/C Ratio	0.77	0.82		0.82	0.71			0.09		0.10	0.10	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.10	0.39		0.00	0.45			0.07		0.17	0.53	
Control Delay	3.1	3.9		3.0	9.3			37.2		38.3	49.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.1	3.9		3.0	9.3			37.2		38.3	49.3	
LOS	A	A		A	A			D		D	D	
Approach Delay		3.8			9.3			37.3			46.7	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	6	79		0	151			5		14	48	
Queue Length 95th (ft)	17	156		1	263			18		37	91	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	629	1546		630	1310			252		271	300	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.10	0.39		0.00	0.45			0.04		0.10	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 9.9
Intersection Capacity Utilization 55.3%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service B

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Build (2024) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	541	3	1	500	27	3	4	2	23	0	78
Future Volume (veh/h)	58	541	3	1	500	27	3	4	2	23	0	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1919	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	64	601	3	1	556	30	3	4	2	26	0	87
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	206	1234	6	290	1206	65	65	54	19	213	0	138
Arrive On Green	0.07	0.64	0.63	0.12	0.69	0.68	0.07	0.07	0.07	0.08	0.00	0.07
Sat Flow, veh/h	1827	1937	10	1781	1758	95	155	733	254	1558	0	1751
Grp Volume(v), veh/h	64	0	604	1	0	586	9	0	0	26	0	87
Grp Sat Flow(s),veh/h/ln	1827	0	1947	1781	0	1853	1143	0	0	1558	0	1751
Q Serve(g_s), s	0.8	0.0	14.7	0.1	0.0	13.1	0.0	0.0	0.0	0.0	0.0	4.3
Cycle Q Clear(g_c), s	0.8	0.0	14.7	0.1	0.0	13.1	4.4	0.0	0.0	1.2	0.0	4.3
Prop In Lane	1.00		0.00	1.00		0.05	0.33		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	206	0	1240	0	0	1271	138	0	0	213	0	138
V/C Ratio(X)	0.31	0.00	0.49	0.00	0.00	0.46	0.07	0.00	0.00	0.12	0.00	0.63
Avail Cap(c_a), veh/h	242	0	1363	0	0	1271	293	0	0	385	0	331
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	8.6	0.0	0.0	6.5	38.9	0.0	0.0	38.8	0.0	40.4
Incr Delay (d2), s/veh	0.3	0.0	1.4	0.0	0.0	1.2	0.1	0.0	0.0	0.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.7	0.0	0.0	4.5	0.2	0.0	0.0	0.5	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	10.0	0.0	0.0	7.7	39.0	0.0	0.0	38.9	0.0	42.2
LnGrp LOS	C	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h		668			587			9			113	
Approach Delay, s/veh		11.4			7.7			39.0			41.4	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	62.3		12.1	11.2	66.7		12.1				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 62	* 62		* 17	7.4	49.4		* 17				
Max Q Clear Time (g_c+I1), s	2.1	16.7		6.3	2.8	15.1		6.4				
Green Ext Time (p_c), s	0.0	2.6		0.1	0.0	2.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 12.5
HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	308	59	161	302	187	57	404	143	123	395	268
Future Volume (vph)	298	308	59	161	302	187	57	404	143	123	395	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00		0.97	0.99	0.99		1.00	0.98	
Frt		0.976				0.850		0.961			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1821	0	1725	1816	1544	1743	3277	0	1778	3248	0
Flt Permitted	0.950			0.302			0.950			0.950		
Satd. Flow (perm)	1762	1821	0	547	1816	1502	1721	3277	0	1771	3248	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	9		6	6		9	8		4	4		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	3%	2%
Adj. Flow (vph)	331	342	66	179	336	208	63	449	159	137	439	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	331	408	0	179	336	208	63	608	0	137	737	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	48.0	55.0		24.0	31.0	24.0	24.0	37.0		24.0	37.0	
Total Split (%)	34.3%	39.3%		17.1%	22.1%	17.1%	17.1%	26.4%		17.1%	26.4%	
Maximum Green (s)	42.1	49.1		18.4	25.1	18.1	17.8	31.3		18.1	31.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	31.6	50.5		63.7	32.1	47.6	10.3	40.9		15.4	48.7	
Actuated g/C Ratio	0.23	0.36		0.46	0.23	0.34	0.07	0.29		0.11	0.35	

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) Noon
12/23/2020

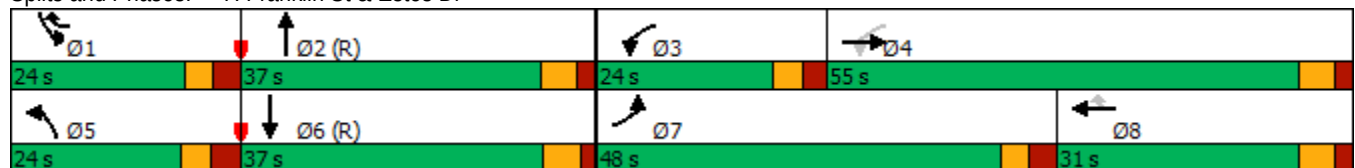
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.83	0.62		0.50	0.81	0.40	0.50	0.64		0.70	0.65	
Control Delay	68.4	41.3		24.5	66.7	34.1	75.1	48.6		78.5	44.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	68.4	41.3		24.5	66.7	34.1	75.1	48.6		78.5	44.3	
LOS	E	D		C	E	C	E	D		E	D	
Approach Delay		53.4			46.9			51.1			49.7	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	289	295		87	285	131	56	263		122	314	
Queue Length 95th (ft)	374	413		129	#482	206	104	352		192	#421	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	546	676		425	416	554	236	957		241	1129	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.61	0.60		0.42	0.81	0.38	0.27	0.64		0.57	0.65	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 108 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 50.2
Intersection Capacity Utilization 82.2%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service E

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) Noon
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	298	308	59	161	302	187	57	404	143	123	395	268
Future Volume (veh/h)	298	308	59	161	302	187	57	404	143	123	395	268
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1788	1788	1909	1894	1894
Adj Flow Rate, veh/h	331	342	66	179	336	208	63	449	159	137	439	298
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	3	3
Cap, veh/h	366	454	88	288	320	405	94	922	324	172	849	572
Arrive On Green	0.20	0.29	0.29	0.09	0.19	0.19	0.05	0.38	0.37	0.09	0.41	0.41
Sat Flow, veh/h	1818	1552	300	1641	1723	1439	1731	2457	862	1818	2049	1381
Grp Volume(v), veh/h	331	0	408	179	336	208	63	309	299	137	385	352
Grp Sat Flow(s),veh/h/ln	1818	0	1852	1641	1723	1439	1731	1698	1621	1818	1800	1630
Q Serve(g_s), s	24.9	0.0	28.0	10.5	26.0	17.0	5.0	19.5	19.8	10.3	22.3	22.6
Cycle Q Clear(g_c), s	24.9	0.0	28.0	10.5	26.0	17.0	5.0	19.5	19.8	10.3	22.3	22.6
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.53	1.00		0.85
Lane Grp Cap(c), veh/h	366	0	542	288	320	405	94	637	609	172	745	675
V/C Ratio(X)	0.90	0.00	0.75	0.62	1.05	0.51	0.67	0.48	0.49	0.80	0.52	0.52
Avail Cap(c_a), veh/h	559	0	661	356	320	405	235	637	609	247	745	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	45.0	33.2	57.0	42.4	65.0	33.4	33.6	62.1	30.6	30.8
Incr Delay (d2), s/veh	9.5	0.0	2.9	0.9	64.0	0.5	3.0	2.6	2.8	6.9	2.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.0	13.2	4.2	16.9	6.1	2.3	8.5	8.3	5.1	10.2	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	0.0	47.9	34.1	121.0	42.9	68.0	36.0	36.5	69.0	33.1	33.7
LnGrp LOS	E	A	D	C	F	D	E	D	D	E	C	C
Approach Vol, veh/h		739			723			671			874	
Approach Delay, s/veh		55.1			77.0			39.2			39.0	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.2	57.6	18.2	46.0	12.6	63.2	33.2	31.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	18.1	* 31	18.4	49.1	* 18	* 32	42.1	25.1				
Max Q Clear Time (g_c+I1), s	12.3	21.8	12.5	30.0	7.0	24.6	26.9	28.0				
Green Ext Time (p_c), s	0.1	1.7	0.1	1.5	0.0	1.9	0.4	0.0				

Intersection Summary

HCM 6th Ctrl Delay 52.1
HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	37	871	18	0	900
Future Volume (vph)	0	37	871	18	0	900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			-2%
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.997			
Flt Protected						
Satd. Flow (prot)	0	1611	3546	0	0	3575
Flt Permitted						
Satd. Flow (perm)	0	1611	3546	0	0	3575
Link Speed (mph)	25		35			35
Link Distance (ft)	471		432			1082
Travel Time (s)	12.8		8.4			21.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	41	968	20	0	1000
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	41	988	0	0	1000
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.6%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	37	871	18	0	900
Future Vol, veh/h	0	37	871	18	0	900
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	-1	-	-	-2
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	41	968	20	0	1000

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	494	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	521	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	521	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	521	-
HCM Lane V/C Ratio	-	0.079	-
HCM Control Delay (s)	-	12.5	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.3	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	45	544	588	45	46	28
Future Volume (vph)	45	544	588	45	46	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.990		0.949	
Flt Protected		0.996			0.970	
Satd. Flow (prot)	0	1855	1844	0	1715	0
Flt Permitted		0.996			0.970	
Satd. Flow (perm)	0	1855	1844	0	1715	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		913	658		374	
Travel Time (s)		17.8	12.8		10.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	604	653	50	51	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	654	703	0	82	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.7%
Analysis Period (min) 15

ICU Level of Service D

Intersection

Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	544	588	45	46	28
Future Vol, veh/h	45	544	588	45	46	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	604	653	50	51	31

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	703	0	0 1382 678
Stage 1	-	-	- 678 -
Stage 2	-	-	- 704 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	895	-	- 159 452
Stage 1	-	-	- 504 -
Stage 2	-	-	- 490 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	895	-	- 146 452
Mov Cap-2 Maneuver	-	-	- 146 -
Stage 1	-	-	- 462 -
Stage 2	-	-	- 490 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	36
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	895	-	-	-	196
HCM Lane V/C Ratio	0.056	-	-	-	0.42
HCM Control Delay (s)	9.3	0	-	-	36
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	1.9

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Build (2024) PM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	60	23	1359	830	5
Future Volume (vph)	32	60	23	1359	830	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1538	1656	3539	3502	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1538	1656	3539	3502	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	12		4			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	5%	9%	2%	3%	2%
Adj. Flow (vph)	36	67	26	1510	922	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	67	26	1510	928	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.6%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Build (2024) PM
12/23/2020

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	60	23	1359	830	5
Future Vol, veh/h	32	60	23	1359	830	5
Conflicting Peds, #/hr	12	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	5	9	2	3	2
Mvmt Flow	36	67	26	1510	922	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1748	468	932
Stage 1	929	-	-
Stage 2	819	-	-
Critical Hdwy	6.84	7	4.28
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.35	2.29
Pot Cap-1 Maneuver	77	534	688
Stage 1	345	-	-
Stage 2	394	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	73	532	685
Mov Cap-2 Maneuver	197	-	-
Stage 1	331	-	-
Stage 2	392	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	685	-	197	532	-	-
HCM Lane V/C Ratio	0.037	-	0.18	0.125	-	-
HCM Control Delay (s)	10.5	-	27.3	12.7	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	255	57	201	317	446	67	1133	251	301	669	206
Future Volume (vph)	246	255	57	201	317	446	67	1133	251	301	669	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		300	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.96			
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3416	1853	1575	1761	3522	1575	1787	3540	1599
Flt Permitted	0.148			0.950			0.284			0.077		
Satd. Flow (perm)	276	1863	1583	3416	1853	1575	526	3522	1509	145	3540	1599
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			941			1063			453	
Travel Time (s)		24.4			18.3			20.7			8.8	
Confl. Peds. (#/hr)									9	9		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	273	283	63	223	352	496	74	1259	279	334	743	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	283	63	223	352	496	74	1259	279	334	743	229
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	23.0	37.9	12.8	18.1	33.0	27.0	12.8	57.0	18.1	27.0	71.2	23.0
Total Split (%)	16.4%	27.1%	9.1%	12.9%	23.6%	19.3%	9.1%	40.7%	12.9%	19.3%	50.9%	16.4%
Maximum Green (s)	18.1	32.4	7.0	12.7	27.5	21.2	7.0	51.0	12.7	21.2	65.2	18.1
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	-1.4	-0.8	-1.0	-0.9
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	45.5	33.7	46.5	11.9	27.5	50.0	74.5	52.0	65.9	74.5	66.7	90.7
Actuated g/C Ratio	0.32	0.24	0.33	0.08	0.20	0.36	0.53	0.37	0.47	0.53	0.48	0.65

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.97	0.63	0.12	0.77	0.97	0.88	0.21	0.96	0.39	0.98	0.44	0.22
Control Delay	85.9	55.2	33.7	80.5	94.9	47.4	15.5	60.4	13.9	88.3	16.5	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.9	55.2	33.7	80.5	94.9	47.4	15.5	60.4	13.9	88.3	16.5	8.8
LOS	F	E	C	F	F	D	B	E	B	F	B	A
Approach Delay		66.5			69.9			50.3			33.5	
Approach LOS		E			E			D			C	
Queue Length 50th (ft)	196	234	40	103	320	282	29	587	85	254	240	93
Queue Length 95th (ft)	#381	336	77	148	#515	#466	54	#741	123	#465	227	76
Internal Link Dist (ft)		1171			861			983			373	
Turn Bay Length (ft)	225		350	300		300	150		250	225		175
Base Capacity (vph)	281	447	525	319	370	562	348	1308	729	340	1685	1035
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.63	0.12	0.70	0.95	0.88	0.21	0.96	0.38	0.98	0.44	0.22

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 52.3
Intersection Capacity Utilization 95.0%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: D
ICU Level of Service F

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr

							
Ø2 (R)			Ø1			Ø3	Ø4
57 s			27 s			18.1 s	37.9 s
							
Ø5	Ø6 (R)					Ø7	Ø8
12.8 s	71.2 s					23 s	33 s

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Build (2024) PM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	255	57	201	317	446	67	1133	251	301	669	206
Future Volume (veh/h)	246	255	57	201	317	446	67	1133	251	301	669	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1864	1864	1864	1864	1864	1864	1949	1934	1949
Adj Flow Rate, veh/h	273	283	63	223	352	496	74	1259	279	334	743	229
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	2
Cap, veh/h	287	463	480	279	373	586	420	1313	722	372	1792	1021
Arrive On Green	0.13	0.25	0.25	0.08	0.20	0.20	0.05	0.37	0.37	0.34	0.98	0.97
Sat Flow, veh/h	1781	1870	1585	3445	1864	1580	1776	3542	1561	1856	3674	1636
Grp Volume(v), veh/h	273	283	63	223	352	496	74	1259	279	334	743	229
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1722	1864	1580	1776	1771	1561	1856	1837	1636
Q Serve(g_s), s	17.1	18.8	4.0	8.9	26.1	12.2	2.8	48.6	8.3	19.1	1.2	0.5
Cycle Q Clear(g_c), s	17.1	18.8	4.0	8.9	26.1	12.2	2.8	48.6	8.3	19.1	1.2	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	463	480	279	373	586	420	1313	722	372	1792	1021
V/C Ratio(X)	0.95	0.61	0.13	0.80	0.94	0.85	0.18	0.96	0.39	0.90	0.41	0.22
Avail Cap(c_a), veh/h	287	463	480	322	373	586	425	1316	724	372	1792	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	46.7	35.5	63.2	55.2	20.0	15.5	43.0	9.6	43.2	0.9	0.5
Incr Delay (d2), s/veh	40.0	1.7	0.0	10.0	32.1	10.6	0.1	16.8	1.6	23.0	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	8.9	1.6	4.3	15.5	10.7	1.1	23.9	2.9	11.3	0.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.4	48.4	35.5	73.2	87.3	30.6	15.6	59.8	11.2	66.2	1.6	1.0
LnGrp LOS	F	D	D	E	F	C	B	E	B	E	A	A
Approach Vol, veh/h		619			1071			1612			1306	
Approach Delay, s/veh		61.2			58.1			49.4			18.0	
Approach LOS		E			E			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.8	56.9	16.3	39.7	12.4	73.3	23.0	33.0				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 21	* 51	12.7	32.4	* 7	* 65	* 18	27.5				
Max Q Clear Time (g_c+I1), s	21.1	50.6	10.9	20.8	4.8	3.2	19.1	28.1				
Green Ext Time (p_c), s	0.0	0.3	0.0	0.5	0.0	4.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	44.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Build (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	24	7	27	108	1	34	14	1644	144	45	1069	18
Future Volume (vph)	24	7	27	108	1	34	14	1644	144	45	1069	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00				
Frt		0.882			0.854			0.988			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1643	0	3364	1488	0	1778	3503	0	1770	3532	0
Flt Permitted	0.950			0.950			0.207			0.068		
Satd. Flow (perm)	1736	1643	0	3364	1488	0	388	3503	0	127	3532	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1061			2618	
Travel Time (s)		18.9			12.9			20.7			51.0	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	27	8	30	120	1	38	16	1827	160	50	1188	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	38	0	120	39	0	16	1987	0	50	1208	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	21.0	21.0		26.0	26.0		93.0	93.0		93.0	93.0	
Total Split (%)	15.0%	15.0%		18.6%	18.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	15.4	15.4		20.1	20.1		87.2	87.2		87.5	87.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	8.4	8.4		9.6	9.6		109.5	109.5		109.5	109.5	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.78	0.78		0.78	0.78	
v/c Ratio	0.26	0.39		0.52	0.38		0.05	0.73		0.51	0.44	
Control Delay	68.6	74.4		70.9	72.7		3.4	5.5		31.5	7.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.6	74.4		70.9	72.7		3.4	5.5		31.5	7.6	
LOS	E	E		E	E		A	A		C	A	
Approach Delay		72.0			71.3			5.5			8.6	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	24	34		55	35		2	171		21	381	
Queue Length 95th (ft)	56	72		87	73		m2	m279		m#65	36	
Internal Link Dist (ft)		474			583			981			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	198	187		504	223		303	2739		99	2762	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.20		0.24	0.17		0.05	0.73		0.51	0.44	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 133 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 68.2%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

					
Ø2 (R)			Ø3		Ø4
93 s			26 s		21 s
					
Ø6 (R)					
93 s					

HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	0	193	2	2	1	265	1421	0	7	916	195
Future Volume (vph)	207	0	193	2	2	1	265	1421	0	7	916	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.97	0.95		0.98	1.00					0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1748	1748	1647	1664	1752	1567	3433	3539	0	1770	3539	1583
Flt Permitted	0.950	0.950		0.950			0.950			0.109		
Satd. Flow (perm)	1743	1743	1597	1575	1752	1543	3430	3539	0	203	3539	1561
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		21	21		2	2		25	25		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	230	0	214	2	2	1	294	1579	0	8	1018	217
Shared Lane Traffic (%)	50%			0%								
Lane Group Flow (vph)	115	115	214	2	2	1	294	1579	0	8	1018	217
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	29.0	19.0	19.0	16.0	29.0	75.0		16.0	62.0	30.0
Total Split (%)	21.4%	21.4%	20.7%	13.6%	13.6%	11.4%	20.7%	53.6%		11.4%	44.3%	21.4%
Maximum Green (s)	22.9	22.9	22.7	12.1	12.1	9.6	22.7	69.0		9.6	55.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	
Pedestrian Calls (#/hr)								0			0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	14.7	14.7	45.0	8.9	8.9	10.2	30.3	107.1		110.5	77.2	92.0
Actuated g/C Ratio	0.10	0.10	0.32	0.06	0.06	0.07	0.22	0.76		0.79	0.55	0.66
v/c Ratio	0.63	0.63	0.41	0.02	0.02	0.01	0.40	0.58		0.03	0.52	0.21
Control Delay	74.4	74.4	33.3	62.0	62.0	45.0	41.5	8.0		5.1	22.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	74.4	74.4	33.3	62.0	62.0	45.0	41.5	8.0		5.1	22.0	8.7
LOS	E	E	C	E	E	D	D	A		A	C	A
Approach Delay		54.6			58.6			13.3			19.6	
Approach LOS		D			E			B			B	
Queue Length 50th (ft)	107	107	135	2	2	1	87	142		1	307	69
Queue Length 95th (ft)	170	170	182	11	11	5	162	506		8	422	110
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	312	312	523	166	175	143	742	2708		284	1952	1084
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.37	0.37	0.41	0.01	0.01	0.01	0.40	0.58		0.03	0.52	0.20

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 71 (51%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 20.7

Intersection LOS: C

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

 Ø1	 Ø2 (R)	 Ø3	 Ø4
16 s	75 s	19 s	30 s
 Ø6 (R)	 Ø5		
62 s	29 s		

HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	17	780	936	24	25	24
Future Volume (vph)	17	780	936	24	25	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.934	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1752	1844	1848	0	1739	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1752	1844	1848	0	1739	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		630	840		813	
Travel Time (s)		12.3	16.4		22.2	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	867	1040	27	28	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	867	1067	0	55	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 61.0%
Analysis Period (min) 15

ICU Level of Service B

Intersection

Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	780	936	24	25	24
Future Vol, veh/h	17	780	936	24	25	24
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	867	1040	27	28	27

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1067	0	0 1959 1055
Stage 1	-	-	- 1054 -
Stage 2	-	-	- 905 -
Critical Hdwy	4.12	-	- 5.42 5.72
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	653	-	- 120 317
Stage 1	-	-	- 449 -
Stage 2	-	-	- 507 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	653	-	- 117 317
Mov Cap-2 Maneuver	-	-	- 117 -
Stage 1	-	-	- 436 -
Stage 2	-	-	- 507 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	36.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	653	-	-	-	169
HCM Lane V/C Ratio	0.029	-	-	-	0.322
HCM Control Delay (s)	10.7	-	-	-	36.1
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Build (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	678	8	2	782	50	3	3	1	36	3	171
Future Volume (vph)	118	678	8	2	782	50	3	3	1	36	3	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			0.99		0.99	0.96	
Frt		0.998			0.991			0.981			0.852	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1787	1877	0	1770	1843	0	0	1719	0	1814	1566	0
Flt Permitted	0.122			0.306				0.883		0.753		
Satd. Flow (perm)	230	1877	0	569	1843	0	0	1542	0	1421	1566	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	2		2	2		2	6		4	4		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	131	753	9	2	869	56	3	3	1	40	3	190
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	762	0	2	925	0	0	7	0	40	193	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	12.6	69.0		69.0	56.4		21.0	21.0		21.0	21.0	
Total Split (%)	14.0%	76.7%		76.7%	62.7%		23.3%	23.3%		23.3%	23.3%	
Maximum Green (s)	7.0	63.4		63.4	50.8		16.1	16.1		15.6	15.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	61.3	66.3		66.3	53.7			8.7		13.7	13.7	
Actuated g/C Ratio	0.68	0.74		0.74	0.60			0.10		0.15	0.15	
v/c Ratio	0.45	0.55		0.00	0.84			0.05		0.19	0.81	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	10.5	7.5		4.0	24.6			35.0		34.2	62.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.5	7.5		4.0	24.6			35.0		34.2	62.0	
LOS	B	A		A	C			C		C	E	
Approach Delay		8.0			24.6			35.0			57.3	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	19	172		0	410			4		20	105	
Queue Length 95th (ft)	41	265		2	#706			15		48	#197	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	288	1382		419	1099			274		252	278	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.45	0.55		0.00	0.84			0.03		0.16	0.69	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.1
Intersection Capacity Utilization 74.8%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: C
ICU Level of Service D

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Build (2024) PM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	678	8	2	782	50	3	3	1	36	3	171
Future Volume (veh/h)	118	678	8	2	782	50	3	3	1	36	3	171
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	131	753	9	2	869	56	3	3	1	40	3	190
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	1102	13	290	1060	68	76	54	12	252	4	240
Arrive On Green	0.08	0.57	0.57	0.12	0.61	0.60	0.15	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1856	1921	23	1781	1738	112	139	397	89	1540	27	1691
Grp Volume(v), veh/h	131	0	762	2	0	925	7	0	0	40	0	193
Grp Sat Flow(s),veh/h/ln	1856	0	1944	1781	0	1850	626	0	0	1540	0	1718
Q Serve(g_s), s	2.1	0.0	24.7	0.1	0.0	35.1	0.0	0.0	0.0	0.0	0.0	9.8
Cycle Q Clear(g_c), s	2.1	0.0	24.7	0.1	0.0	35.1	9.8	0.0	0.0	2.9	0.0	9.8
Prop In Lane	1.00		0.01	1.00		0.06	0.43		0.14	1.00		0.98
Lane Grp Cap(c), veh/h	231	0	1115	0	0	1128	150	0	0	252	0	244
V/C Ratio(X)	0.57	0.00	0.68	0.00	0.00	0.82	0.05	0.00	0.00	0.16	0.00	0.79
Avail Cap(c_a), veh/h	237	0	1383	0	0	1128	201	0	0	308	0	305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	13.5	0.0	0.0	13.7	33.8	0.0	0.0	34.4	0.0	37.5
Incr Delay (d2), s/veh	1.8	0.0	3.4	0.0	0.0	6.7	0.0	0.0	0.0	0.1	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	10.5	0.0	0.0	14.4	0.1	0.0	0.0	0.8	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	16.9	0.0	0.0	20.4	33.8	0.0	0.0	34.5	0.0	45.8
LnGrp LOS	C	A	B	A	A	C	C	A	A	C	A	D
Approach Vol, veh/h		893			927			7			233	
Approach Delay, s/veh		18.6			20.4			33.8			43.9	
Approach LOS		B			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	56.6		17.8	12.3	59.9		17.8				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 63	* 63		* 16	7.0	50.8		* 16				
Max Q Clear Time (g_c+I1), s	2.1	26.7		11.8	4.1	37.1		11.8				
Green Ext Time (p_c), s	0.0	3.7		0.2	0.0	4.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	22.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	376	69	191	348	249	68	751	191	120	564	453
Future Volume (vph)	346	376	69	191	348	249	68	751	191	120	564	453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99				0.97	0.99	0.99		0.99	0.96	
Frt		0.977				0.850		0.970			0.933	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1820	0	1725	1816	1544	1743	3339	0	1761	3187	0
Flt Permitted	0.950			0.160			0.950			0.950		
Satd. Flow (perm)	1763	1820	0	291	1816	1503	1718	3339	0	1744	3187	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	8		13	13		8	15		17	17		15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	384	418	77	212	387	277	76	834	212	133	627	503
Shared Lane Traffic (%)												
Lane Group Flow (vph)	384	495	0	212	387	277	76	1046	0	133	1130	0
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				4		8						
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	
Total Split (s)	40.0	48.0		20.0	33.0	20.0	15.0	57.0		20.0	62.0	
Total Split (%)	26.7%	32.0%		13.3%	22.0%	13.3%	10.0%	38.0%		13.3%	41.3%	
Maximum Green (s)	34.1	42.1		14.4	27.1	14.1	8.8	51.3		14.1	56.5	
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	34.2	49.7		64.2	30.0	44.1	9.6	51.7		14.1	56.3	
Actuated g/C Ratio	0.23	0.33		0.43	0.20	0.29	0.06	0.34		0.09	0.38	

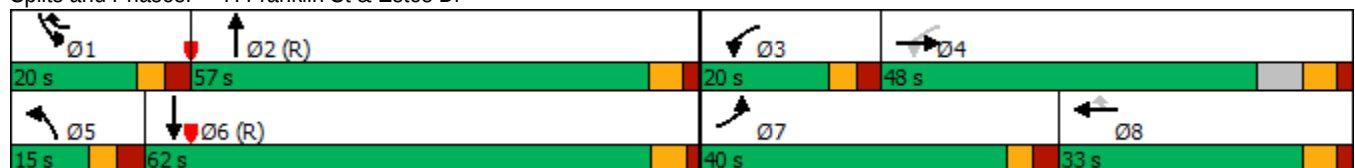
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.95	0.82		0.81	1.07	0.62	0.68	0.91		0.80	0.95	
Control Delay	90.1	59.1		49.9	122.2	49.6	98.0	59.2		98.5	61.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	90.1	59.1		49.9	122.2	49.6	98.0	59.2		98.5	61.2	
LOS	F	E		D	F	D	F	E		F	E	
Approach Delay		72.7			81.7			61.8			65.1	
Approach LOS		E			F			E			E	
Queue Length 50th (ft)	371	454		128	~441	225	74	512		129	556	
Queue Length 95th (ft)	#569	#641		#235	#652	324	#148	#637		#233	#700	
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		
Base Capacity (vph)	415	603		269	362	454	116	1157		176	1211	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.93	0.82		0.79	1.07	0.61	0.66	0.90		0.76	0.93	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 104 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 69.3
Intersection Capacity Utilization 91.4%
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: E
ICU Level of Service F

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Build (2024) PM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	376	69	191	348	249	68	751	191	120	564	453
Future Volume (veh/h)	346	376	69	191	348	249	68	751	191	120	564	453
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1817	1817	1894	1909	1909
Adj Flow Rate, veh/h	384	418	77	212	387	277	76	834	212	133	627	503
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	2	2
Cap, veh/h	413	491	90	263	322	400	107	981	249	165	739	590
Arrive On Green	0.23	0.31	0.31	0.10	0.19	0.19	0.06	0.36	0.36	0.09	0.39	0.39
Sat Flow, veh/h	1818	1565	288	1641	1723	1430	1731	2711	689	1804	1896	1515
Grp Volume(v), veh/h	384	0	495	212	387	277	76	531	515	133	600	530
Grp Sat Flow(s),veh/h/ln	1818	0	1853	1641	1723	1430	1731	1726	1674	1804	1814	1596
Q Serve(g_s), s	31.0	0.0	37.5	13.1	28.0	26.0	6.5	42.5	42.6	10.8	45.2	45.6
Cycle Q Clear(g_c), s	31.0	0.0	37.5	13.1	28.0	26.0	6.5	42.5	42.6	10.8	45.2	45.6
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.41	1.00		0.95
Lane Grp Cap(c), veh/h	413	0	581	263	322	400	107	624	605	165	707	622
V/C Ratio(X)	0.93	0.00	0.85	0.81	1.20	0.69	0.71	0.85	0.85	0.81	0.85	0.85
Avail Cap(c_a), veh/h	424	0	581	263	322	400	115	624	605	180	707	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	0.0	48.3	36.0	61.0	48.5	69.0	44.1	44.3	66.8	41.7	42.1
Incr Delay (d2), s/veh	26.3	0.0	11.1	15.5	117.3	4.2	13.7	13.6	14.0	19.2	12.1	13.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.2	0.0	19.0	6.3	22.6	9.7	3.3	20.4	19.9	5.9	22.4	20.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.1	0.0	59.4	51.5	178.3	52.7	82.7	57.8	58.3	86.1	53.8	55.9
LnGrp LOS	F	A	E	D	F	D	F	E	E	F	D	E
Approach Vol, veh/h		879			876			1122			1263	
Approach Delay, s/veh		69.8			107.9			59.7			58.1	
Approach LOS		E			F			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.7	59.3	20.0	52.0	14.3	63.7	39.0	33.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 51	14.4	42.1	* 8.8	* 57	34.1	27.1				
Max Q Clear Time (g_c+I1), s	12.8	44.6	15.1	39.5	8.5	47.6	33.0	30.0				
Green Ext Time (p_c), s	0.0	2.6	0.0	0.6	0.0	3.6	0.1	0.0				

Intersection Summary

HCM 6th Ctrl Delay	71.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	34	1805	25	0	1176
Future Volume (vph)	0	34	1805	25	0	1176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			-2%
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1611	3550	0	0	3575
Flt Permitted						
Satd. Flow (perm)	0	1611	3550	0	0	3575
Link Speed (mph)	25		35			35
Link Distance (ft)	522		453			1061
Travel Time (s)	14.2		8.8			20.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	38	2006	28	0	1307
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	2034	0	0	1307
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 60.7%
Analysis Period (min) 15

ICU Level of Service B

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	34	1805	25	0	1176
Future Vol, veh/h	0	34	1805	25	0	1176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	-1	-	-	-2
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	2006	28	0	1307

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	1017	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	235	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	235	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 235	-
HCM Lane V/C Ratio	-	- 0.161	-
HCM Control Delay (s)	-	- 23.2	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0.6	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	754	941	51	37	26
Future Volume (vph)	55	754	941	51	37	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.993		0.944	
Flt Protected		0.997			0.972	
Satd. Flow (prot)	0	1857	1850	0	1709	0
Flt Permitted		0.997			0.972	
Satd. Flow (perm)	0	1857	1850	0	1709	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		941	630		397	
Travel Time (s)		18.3	12.3		10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	61	838	1046	57	41	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	899	1103	0	70	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 95.2%
Analysis Period (min) 15

ICU Level of Service F

Intersection

Int Delay, s/veh	6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	754	941	51	37	26
Future Vol, veh/h	55	754	941	51	37	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	838	1046	57	41	29

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1103	0	0 2035 1075
Stage 1	-	-	- 1075 -
Stage 2	-	-	- 960 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	633	-	- 63 267
Stage 1	-	-	- 328 -
Stage 2	-	-	- 372 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	633	-	- 52 267
Mov Cap-2 Maneuver	-	-	- 52 -
Stage 1	-	-	- 269 -
Stage 2	-	-	- 372 -

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	166.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	633	-	-	-	78
HCM Lane V/C Ratio	0.097	-	-	-	0.897
HCM Control Delay (s)	11.3	0	-	-	166.5
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	4.6

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Improved (2024) AM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	4	100	81	616	1127	120
Future Volume (vph)	4	100	81	616	1127	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.986	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1509	1719	3343	3429	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1509	1719	3343	3429	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	8		2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	7%	5%	8%	4%	2%
Adj. Flow (vph)	4	111	90	684	1252	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	111	90	684	1385	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.8%

ICU Level of Service A

Analysis Period (min) 15

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Improved (2024) AM
12/23/2020

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	100	81	616	1127	120
Future Vol, veh/h	4	100	81	616	1127	120
Conflicting Peds, #/hr	8	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	7	5	8	4	2
Mvmt Flow	4	111	90	684	1252	133

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1851	695	1387
Stage 1	1321	-	-
Stage 2	530	-	-
Critical Hdwy	6.84	7.04	4.2
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.37	2.25
Pot Cap-1 Maneuver	66	373	474
Stage 1	214	-	-
Stage 2	555	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	53	372	473
Mov Cap-2 Maneuver	137	-	-
Stage 1	173	-	-
Stage 2	554	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.2	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	473	-	137	372	-	-
HCM Lane V/C Ratio	0.19	-	0.032	0.299	-	-
HCM Control Delay (s)	14.4	-	32.2	18.7	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	1.2	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	308	82	185	156	241	35	460	127	402	984	227
Future Volume (vph)	275	308	82	185	156	241	35	460	127	402	984	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		500	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3383	1818	1545	1761	3326	1545	1787	3506	1584
Flt Permitted	0.391			0.950			0.154			0.347		
Satd. Flow (perm)	728	1863	1583	3383	1818	1545	285	3326	1504	651	3506	1584
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			906			1063			488	
Travel Time (s)		24.4			17.6			20.7			9.5	
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	4%	4%	2%	8%	4%	2%	4%	3%
Adj. Flow (vph)	306	342	91	206	173	268	39	511	141	447	1093	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	306	342	91	206	173	268	39	511	141	447	1093	252
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	27.1	39.0	12.9	17.0	28.9	38.0	12.9	36.0	17.0	38.0	61.1	27.1
Total Split (%)	20.8%	30.0%	9.9%	13.1%	22.2%	29.2%	9.9%	27.7%	13.1%	29.2%	47.0%	20.8%
Maximum Green (s)	22.2	33.5	7.1	11.6	23.4	32.2	7.1	30.0	11.6	32.2	55.1	22.2
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	0.0	-0.8	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.0	5.0	4.9
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	38.4	27.4	40.2	11.0	18.0	47.8	71.6	41.8	52.0	71.6	63.8	89.3
Actuated g/C Ratio	0.30	0.21	0.31	0.08	0.14	0.37	0.55	0.32	0.40	0.55	0.49	0.69

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) AM
12/23/2020

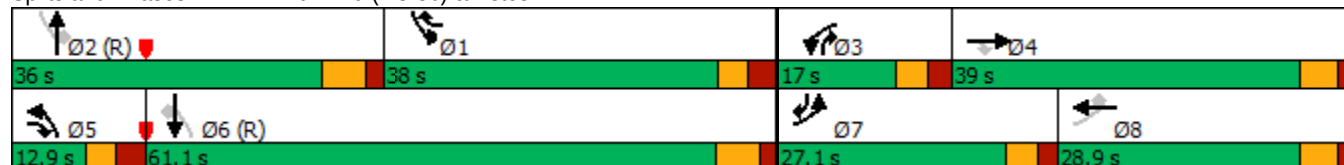
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.81	0.87	0.19	0.72	0.69	0.47	0.16	0.48	0.23	0.72	0.64	0.23
Control Delay	51.4	71.5	32.4	72.3	67.0	19.0	15.0	39.7	15.4	30.9	24.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	71.5	32.4	72.3	67.0	19.0	15.0	39.7	15.4	30.9	24.5	6.4
LOS	D	E	C	E	E	B	B	D	B	C	C	A
Approach Delay		58.4			48.8			33.4			23.5	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)	204	279	56	88	141	97	14	187	39	150	247	41
Queue Length 95th (ft)	272	373	94	130	209	118	34	267	68	299	435	89
Internal Link Dist (ft)		1171			826			983			408	
Turn Bay Length (ft)	225		350	300		500	150		250	225		175
Base Capacity (vph)	404	487	490	318	334	608	247	1068	619	665	1720	1113
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.19	0.65	0.52	0.44	0.16	0.48	0.23	0.67	0.64	0.23

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 84 (65%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 36.2
 Intersection Capacity Utilization 85.7%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) AM
12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	308	82	185	156	241	35	460	127	402	984	227
Future Volume (veh/h)	275	308	82	185	156	241	35	460	127	402	984	227
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1850	1835	1835	1864	1776	1835	1949	1919	1934
Adj Flow Rate, veh/h	306	342	91	206	173	268	39	511	141	447	1093	252
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	3	4	4	2	8	4	2	4	3
Cap, veh/h	366	377	398	266	210	770	348	629	392	790	1895	1108
Arrive On Green	0.17	0.20	0.20	0.08	0.11	0.12	0.05	0.19	0.18	0.76	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	3417	1835	1555	1776	3374	1542	1856	3645	1634
Grp Volume(v), veh/h	306	342	91	206	173	268	39	511	141	447	1093	252
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1709	1835	1555	1776	1687	1542	1856	1823	1634
Q Serve(g_s), s	19.5	23.2	5.9	7.7	12.0	5.3	1.3	18.9	3.1	2.8	0.0	0.0
Cycle Q Clear(g_c), s	19.5	23.2	5.9	7.7	12.0	5.3	1.3	18.9	3.1	2.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	377	398	266	210	770	348	629	392	790	1895	1108
V/C Ratio(X)	0.84	0.91	0.23	0.77	0.82	0.35	0.11	0.81	0.36	0.57	0.58	0.23
Avail Cap(c_a), veh/h	375	489	492	315	337	878	373	804	472	790	1895	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	50.7	38.7	58.8	56.3	6.8	12.6	50.7	16.7	9.7	0.0	0.0
Incr Delay (d2), s/veh	13.9	15.1	0.1	7.8	3.9	0.1	0.1	11.0	2.6	0.6	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	12.4	2.3	3.6	5.7	2.2	0.5	8.9	2.1	3.5	0.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.9	65.8	38.8	66.6	60.2	6.9	12.6	61.7	19.2	10.3	1.3	0.5
LnGrp LOS	E	E	D	E	E	A	B	E	B	B	A	A
Approach Vol, veh/h		739			647			691			1792	
Approach Delay, s/veh		58.4			40.2			50.3			3.4	
Approach LOS		E			D			D			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.4	29.2	15.1	31.2	11.1	72.6	26.5	19.9				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 32	* 30	11.6	33.5	* 7.1	* 55	* 22	23.4				
Max Q Clear Time (g_c+I1), s	4.8	20.9	9.7	25.2	3.3	2.0	21.5	14.0				
Green Ext Time (p_c), s	0.2	1.8	0.0	0.5	0.0	6.7	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Improved (2024) AM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	2	0	7	166	1	41	14	935	68	22	1471	2
Future Volume (vph)	2	0	7	166	1	41	14	935	68	22	1471	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99		1.00				1.00		1.00		
Frt		0.850			0.853			0.990				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1234	0	3332	1542	0	1499	3413	0	1641	3505	0
Flt Permitted	0.950			0.950			0.117			0.231		
Satd. Flow (perm)	1770	1234	0	3320	1542	0	185	3413	0	399	3505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1027			2618	
Travel Time (s)		18.9			12.9			20.0			51.0	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	29%	3%	2%	3%	21%	5%	6%	10%	3%	2%
Adj. Flow (vph)	2	0	8	184	1	46	16	1039	76	24	1634	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	8	0	184	47	0	16	1115	0	24	1636	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	20.0	20.0		24.0	24.0		86.0	86.0		86.0	86.0	
Total Split (%)	15.4%	15.4%		18.5%	18.5%		66.2%	66.2%		66.2%	66.2%	
Maximum Green (s)	14.4	14.4		18.1	18.1		80.2	80.2		80.5	80.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Improved (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.6	7.6		11.5	11.5		103.5	103.5		103.5	103.5	
Actuated g/C Ratio	0.06	0.06		0.09	0.09		0.80	0.80		0.80	0.80	
v/c Ratio	0.02	0.11		0.63	0.35		0.11	0.41		0.08	0.59	
Control Delay	58.0	61.7		66.4	61.8		5.1	4.3		2.7	3.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.0	61.7		66.4	61.8		5.1	4.3		2.7	3.3	
LOS	E	E		E	E		A	A		A	A	
Approach Delay		61.0			65.4			4.3			3.3	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	7		78	38		3	122		2	69	
Queue Length 95th (ft)	11	24		114	77		m7	158		m2	88	
Internal Link Dist (ft)		474			583			947			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	204	142		486	225		147	2716		317	2789	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.06		0.38	0.21		0.11	0.41		0.08	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 80 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 8.6
Intersection Capacity Utilization 60.5%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
ICU Level of Service B

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

					
Ø2 (R)	Ø3	Ø4	Ø5 (R)	Ø6 (R)	Ø7 (R)
86 s	24 s	20 s	86 s		

HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	6	261	2	0	1	121	872	2	9	1224	123
Future Volume (vph)	224	6	261	2	0	1	121	872	2	9	1224	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00		1.00		0.98
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.955		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	1682	1695	1647	1664	1664	1567	3242	3468	0	1770	3505	1482
Flt Permitted	0.950	0.955		0.950	0.950		0.950			0.254		
Satd. Flow (perm)	1680	1692	1621	1646	1646	1546	3238	3468	0	473	3505	1457
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	1		4	4		1	5		1	1		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	8%	4%	50%	2%	3%	9%
Adj. Flow (vph)	249	7	290	2	0	1	134	969	2	10	1360	137
Shared Lane Traffic (%)	49%			50%								
Lane Group Flow (vph)	127	129	290	1	1	1	134	971	0	10	1360	137
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	28.0	28.0	28.0	17.0	17.0	17.0	28.0	68.0		17.0	57.0	28.0
Total Split (%)	21.5%	21.5%	21.5%	13.1%	13.1%	13.1%	21.5%	52.3%		13.1%	43.8%	21.5%
Maximum Green (s)	20.9	20.9	21.7	10.1	10.1	10.6	21.7	62.0		10.6	50.6	20.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	15.4	15.4	36.9	8.9	8.9	10.2	21.5	96.5		99.8	75.3	90.7
Actuated g/C Ratio	0.12	0.12	0.28	0.07	0.07	0.08	0.17	0.74		0.77	0.58	0.70
v/c Ratio	0.64	0.65	0.62	0.01	0.01	0.01	0.25	0.38		0.02	0.67	0.13
Control Delay	68.5	68.7	39.4	57.0	57.0	40.0	49.6	5.5		5.7	23.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.5	68.7	39.4	57.0	57.0	40.0	49.6	5.5		5.7	23.0	6.5
LOS	E	E	D	E	E	D	D	A		A	C	A
Approach Delay		53.1			51.3			10.9			21.4	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	109	110	197	1	1	1	57	21		1	384	28
Queue Length 95th (ft)	173	173	218	7	7	5	87	234		9	652	71
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	297	299	480	153	153	165	573	2573		488	2030	1069
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.43	0.43	0.60	0.01	0.01	0.01	0.23	0.38		0.02	0.67	0.13

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 39 (30%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 23.2

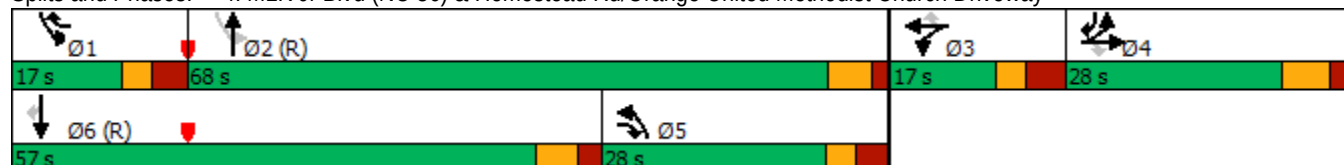
Intersection LOS: C

Intersection Capacity Utilization 68.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	821	565	13	17	16
Future Volume (vph)	22	821	565	13	17	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.934	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1752	1844	1830	0	1675	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1752	1844	1830	0	1675	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		665	840		813	
Travel Time (s)		13.0	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	2%	2%	10%
Adj. Flow (vph)	24	912	628	14	19	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	912	642	0	37	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 53.2%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	821	565	13	17	16
Future Vol, veh/h	22	821	565	13	17	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	2	2	10
Mvmt Flow	24	912	628	14	19	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	642	0	0 1595 635
Stage 1	-	-	- 635 -
Stage 2	-	-	- 960 -
Critical Hdwy	4.12	-	- 5.42 5.8
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.39
Pot Cap-1 Maneuver	943	-	- 183 507
Stage 1	-	-	- 630 -
Stage 2	-	-	- 485 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	943	-	- 178 507
Mov Cap-2 Maneuver	-	-	- 178 -
Stage 1	-	-	- 614 -
Stage 2	-	-	- 485 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	21.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	943	-	-	-	260
HCM Lane V/C Ratio	0.026	-	-	-	0.141
HCM Control Delay (s)	8.9	-	-	-	21.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	741	3	1	491	33	9	9	7	44	2	131
Future Volume (vph)	185	741	3	1	491	33	9	9	7	44	2	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.98			0.92	
Frt		0.999			0.990			0.961			0.852	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1787	1879	0	1770	1806	0	0	1696	0	1814	1467	0
Flt Permitted	0.342			0.278				0.878		0.739		
Satd. Flow (perm)	643	1879	0	518	1806	0	0	1490	0	1411	1467	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	8		2	2		8	21					21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	4%
Adj. Flow (vph)	206	823	3	1	546	37	10	10	8	49	2	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	826	0	1	583	0	0	28	0	49	148	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	16.0	67.0		67.0	51.0		23.0	23.0		23.0	23.0	
Total Split (%)	17.8%	74.4%		74.4%	56.7%		25.6%	25.6%		25.6%	25.6%	
Maximum Green (s)	10.4	61.4		61.4	45.4		18.1	18.1		17.6	17.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	62.0	67.0		67.0	53.7			11.0		13.0	13.0	
Actuated g/C Ratio	0.69	0.74		0.74	0.60			0.12		0.14	0.14	

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	0.59		0.00	0.54			0.15		0.24	0.70	
Control Delay	6.2	8.2		4.0	14.4			34.4		35.1	53.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	6.2	8.2		4.0	14.4			34.4		35.1	53.4	
LOS	A	A		A	B			C		D	D	
Approach Delay		7.8			14.3			34.4			48.9	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	27	174		0	177			15		25	81	
Queue Length 95th (ft)	62	349		2	341			36		54	135	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	602	1402		386	1079			301		284	296	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.34	0.59		0.00	0.54			0.09		0.17	0.50	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 14.7
 Intersection Capacity Utilization 71.4%
 Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) AM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	741	3	1	491	33	9	9	7	44	2	131
Future Volume (veh/h)	185	741	3	1	491	33	9	9	7	44	2	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.96		0.92	0.95		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1841	1841	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	206	823	3	1	546	37	10	10	8	49	2	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	4	4	2	2	2	2	2	2
Cap, veh/h	253	1119	4	290	1024	69	75	59	32	253	3	222
Arrive On Green	0.09	0.58	0.57	0.12	0.60	0.59	0.13	0.13	0.13	0.14	0.14	0.13
Sat Flow, veh/h	1856	1940	7	1781	1704	115	155	445	240	1463	22	1597
Grp Volume(v), veh/h	206	0	826	1	0	583	28	0	0	49	0	148
Grp Sat Flow(s),veh/h/ln	1856	0	1947	1781	0	1819	841	0	0	1463	0	1619
Q Serve(g_s), s	5.8	0.0	28.1	0.1	0.0	16.9	0.1	0.0	0.0	0.0	0.0	7.8
Cycle Q Clear(g_c), s	5.8	0.0	28.1	0.1	0.0	16.9	7.9	0.0	0.0	3.5	0.0	7.8
Prop In Lane	1.00		0.00	1.00		0.06	0.36		0.29	1.00		0.99
Lane Grp Cap(c), veh/h	253	0	1123	0	0	1094	167	0	0	253	0	225
V/C Ratio(X)	0.81	0.00	0.74	0.00	0.00	0.53	0.17	0.00	0.00	0.19	0.00	0.66
Avail Cap(c_a), veh/h	307	0	1341	0	0	1094	249	0	0	343	0	324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	14.0	0.0	0.0	10.5	34.6	0.0	0.0	34.9	0.0	36.9
Incr Delay (d2), s/veh	10.8	0.0	4.3	0.0	0.0	1.9	0.2	0.0	0.0	0.1	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	12.1	0.0	0.0	6.5	0.5	0.0	0.0	1.0	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	0.0	18.3	0.0	0.0	12.4	34.7	0.0	0.0	35.0	0.0	38.2
LnGrp LOS	D	A	B	A	A	B	C	A	A	D	A	D
Approach Vol, veh/h		1032			584			28			197	
Approach Delay, s/veh		23.0			12.4			34.7			37.4	
Approach LOS		C			B			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	56.9		17.5	13.4	59.1		17.5				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 61	* 61		* 18	10.4	45.4		* 18				
Max Q Clear Time (g_c+I1), s	2.1	30.1		9.8	7.8	18.9		9.9				
Green Ext Time (p_c), s	0.0	4.1		0.2	0.0	2.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) AM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	369	64	106	223	112	52	366	83	94	555	262
Future Volume (vph)	380	369	64	106	223	112	52	366	83	94	555	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		350
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	1.00				0.98	0.98	1.00		1.00		0.94
Frt		0.978				0.850		0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1827	0	1692	1748	1514	1743	3294	0	1711	3522	1576
Flt Permitted	0.950			0.266			0.950			0.950		
Satd. Flow (perm)	1765	1827	0	474	1748	1480	1716	3294	0	1708	3522	1488
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	7		3	3		7	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	4%	6%	4%	2%	5%	2%	6%	3%	3%
Adj. Flow (vph)	422	410	71	118	248	124	58	407	92	104	617	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	422	481	0	118	248	124	58	499	0	104	617	291
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				4		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	12.9
Total Split (s)	35.0	35.0		35.0	35.0	20.0	20.0	40.0		20.0	40.0	35.0
Total Split (%)	26.9%	26.9%		26.9%	26.9%	15.4%	15.4%	30.8%		15.4%	30.8%	26.9%
Maximum Green (s)	29.1	29.1		29.4	29.1	14.1	13.8	34.3		14.1	34.5	29.1
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	3.0
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	2.9
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.9
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	37.1	51.9		61.8	24.7	37.2	9.7	35.7		12.5	41.1	76.4
Actuated g/C Ratio	0.29	0.40		0.48	0.19	0.29	0.07	0.27		0.10	0.32	0.59

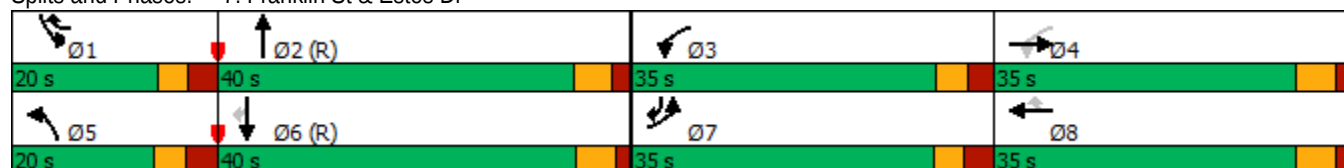
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.83	0.66		0.37	0.75	0.29	0.45	0.55		0.63	0.55	0.32
Control Delay	59.3	37.7		20.2	64.0	33.2	68.1	43.6		73.6	40.2	13.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.3	37.7		20.2	64.0	33.2	68.1	43.6		73.6	40.2	13.8
LOS	E	D		C	E	C	E	D		E	D	B
Approach Delay		47.8			45.7			46.1			36.1	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	322	318		49	201	77	48	195		85	236	105
Queue Length 95th (ft)	#570	474		86	282	117	93	253		146	306	192
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		350
Base Capacity (vph)	507	728		524	403	456	201	929		198	1114	899
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.83	0.66		0.23	0.62	0.27	0.29	0.54		0.53	0.55	0.32

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 124 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 43.1
 Intersection Capacity Utilization 82.2%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) AM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	369	64	106	223	112	52	366	83	94	555	262
Future Volume (veh/h)	380	369	64	106	223	112	52	366	83	94	555	262
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1693	1664	1693	1817	1773	1773	1849	1894	1894
Adj Flow Rate, veh/h	422	410	71	118	248	124	58	407	92	104	617	291
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	4	6	4	2	5	5	6	3	3
Cap, veh/h	420	541	94	254	296	366	98	978	219	139	1365	955
Arrive On Green	0.23	0.34	0.33	0.07	0.18	0.18	0.06	0.36	0.35	0.08	0.38	0.38
Sat Flow, veh/h	1818	1584	274	1613	1664	1418	1731	2727	610	1761	3599	1586
Grp Volume(v), veh/h	422	0	481	118	248	124	58	250	249	104	617	291
Grp Sat Flow(s),veh/h/ln	1818	0	1858	1613	1664	1418	1731	1684	1654	1761	1800	1586
Q Serve(g_s), s	30.0	0.0	29.9	6.1	18.7	9.3	4.3	14.5	14.8	7.5	16.7	11.7
Cycle Q Clear(g_c), s	30.0	0.0	29.9	6.1	18.7	9.3	4.3	14.5	14.8	7.5	16.7	11.7
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	420	0	635	254	296	366	98	604	593	139	1365	955
V/C Ratio(X)	1.01	0.00	0.76	0.46	0.84	0.34	0.59	0.41	0.42	0.75	0.45	0.30
Avail Cap(c_a), veh/h	420	0	635	518	384	440	200	604	593	203	1365	955
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	0.0	38.0	28.7	51.6	39.3	59.9	31.4	31.6	58.6	30.2	12.8
Incr Delay (d2), s/veh	45.3	0.0	4.7	0.5	9.6	0.2	2.1	2.1	2.2	3.8	1.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.7	0.0	14.3	2.4	8.5	3.2	1.9	6.2	6.3	3.5	7.4	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.3	0.0	42.7	29.2	61.2	39.5	62.0	33.5	33.8	62.5	31.3	13.6
LnGrp LOS	F	A	D	C	E	D	E	C	C	E	C	B
Approach Vol, veh/h		903			490			557			1012	
Approach Delay, s/veh		67.3			48.0			36.6			29.4	
Approach LOS		E			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	51.6	13.7	49.4	12.3	54.5	35.0	28.2				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	14.1	* 34	29.4	29.1	* 14	* 35	29.1	29.1				
Max Q Clear Time (g_c+I1), s	9.5	16.8	8.1	31.9	6.3	18.7	32.0	20.7				
Green Ext Time (p_c), s	0.0	1.7	0.1	0.0	0.0	3.0	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	45.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
8: MLK Jr Blvd (NC 86) & Future Access #1

Improved (2024) AM
12/23/2020

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	44	963	14	0	1613
Future Volume (vph)	0	44	963	14	0	1613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			-2%
Storage Length (ft)	0	0		100	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3557	1591	0	3575
Flt Permitted						
Satd. Flow (perm)	0	1611	3557	1591	0	3575
Link Speed (mph)	25		35			35
Link Distance (ft)	569		488			1027
Travel Time (s)	15.5		9.5			20.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	49	1070	16	0	1792
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	49	1070	16	0	1792
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.9%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh 0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	44	963	14	0	1613
Future Vol, veh/h	0	44	963	14	0	1613
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	-1	-	-	-2
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	49	1070	16	0	1792

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	535	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	490	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	490	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	490
HCM Lane V/C Ratio	-	-	0.1
HCM Control Delay (s)	-	-	13.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.3

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	803	550	33	53	32
Future Volume (vph)	34	803	550	33	53	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			100	100	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		35	35		25	
Link Distance (ft)		906	665		381	
Travel Time (s)		17.6	13.0		10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	892	611	37	59	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	892	611	37	59	36
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.3%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh 2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	803	550	33	53	32
Future Vol, veh/h	34	803	550	33	53	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	892	611	37	59	36

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	648	0	0 1579 611
Stage 1	-	-	- 611 -
Stage 2	-	-	- 968 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	938	-	- 120 494
Stage 1	-	-	- 542 -
Stage 2	-	-	- 368 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	938	-	- 115 494
Mov Cap-2 Maneuver	-	-	- 115 -
Stage 1	-	-	- 520 -
Stage 2	-	-	- 368 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	45.6
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	938	-	-	-	115	494
HCM Lane V/C Ratio	0.04	-	-	-	0.512	0.072
HCM Control Delay (s)	9	-	-	-	65.3	12.9
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.4	0.2

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Improved (2024) Noon
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	19	62	80	674	627	33
Future Volume (vph)	19	62	80	674	627	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.992	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1719	1538	1752	3438	3445	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1719	1538	1752	3438	3445	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	6					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	3%	5%	4%	3%
Adj. Flow (vph)	21	69	89	749	697	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	69	89	749	734	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.1% ICU Level of Service A
Analysis Period (min) 15

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Improved (2024) Noon
12/23/2020

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	62	80	674	627	33
Future Vol, veh/h	19	62	80	674	627	33
Conflicting Peds, #/hr	6	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	3	5	4	3
Mvmt Flow	21	69	89	749	697	37

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1275	367	734
Stage 1	716	-	-
Stage 2	559	-	-
Critical Hdwy	6.9	7	4.16
Critical Hdwy Stg 1	5.9	-	-
Critical Hdwy Stg 2	5.9	-	-
Follow-up Hdwy	3.55	3.35	2.23
Pot Cap-1 Maneuver	155	621	860
Stage 1	437	-	-
Stage 2	528	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	139	621	860
Mov Cap-2 Maneuver	267	-	-
Stage 1	392	-	-
Stage 2	528	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	860	-	267	621	-	-
HCM Lane V/C Ratio	0.103	-	0.079	0.111	-	-
HCM Control Delay (s)	9.7	-	19.6	11.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	181	26	164	216	236	42	475	138	269	467	164
Future Volume (vph)	178	181	26	164	216	236	42	475	138	269	467	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		500	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1495	3383	1853	1575	1604	3421	1575	1753	3440	1568
Flt Permitted	0.274			0.950			0.416			0.372		
Satd. Flow (perm)	510	1863	1495	3383	1853	1575	700	3421	1575	686	3440	1530
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			913			1063			432	
Travel Time (s)		24.4			17.8			20.7			8.4	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	8%	3%	2%	2%	12%	5%	2%	4%	6%	4%
Adj. Flow (vph)	198	201	29	182	240	262	47	528	153	299	519	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	201	29	182	240	262	47	528	153	299	519	182
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	21.0	37.0	14.0	17.0	33.0	26.0	14.0	40.0	17.0	26.0	52.0	21.0
Total Split (%)	17.5%	30.8%	11.7%	14.2%	27.5%	21.7%	11.7%	33.3%	14.2%	21.7%	43.3%	17.5%
Maximum Green (s)	16.1	31.5	8.2	11.6	27.5	20.2	8.2	34.0	11.6	20.2	46.0	16.1
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	-1.4	-0.8	-1.0	-0.9
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	33.6	23.3	36.1	10.4	19.5	38.5	67.4	47.4	59.8	66.4	61.1	77.2
Actuated g/C Ratio	0.28	0.19	0.30	0.09	0.16	0.32	0.56	0.40	0.50	0.55	0.51	0.64

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) Noon
12/23/2020

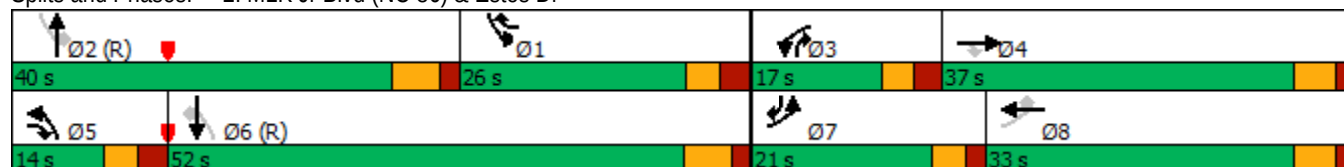
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.68	0.56	0.06	0.62	0.80	0.52	0.10	0.39	0.20	0.55	0.30	0.18
Control Delay	42.0	48.6	27.5	62.2	66.8	22.2	13.5	29.8	10.5	26.5	19.9	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	48.6	27.5	62.2	66.8	22.2	13.5	29.8	10.5	26.5	19.9	9.5
LOS	D	D	C	E	E	C	B	C	B	C	B	A
Approach Delay		44.1			48.5			24.7			20.0	
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	116	141	16	71	181	110	14	154	32	153	164	74
Queue Length 95th (ft)	157	202	36	107	255	118	39	247	67	188	235	137
Internal Link Dist (ft)		1171			833			983			352	
Turn Bay Length (ft)	225		350	300		500	150		250	225		175
Base Capacity (vph)	324	496	464	347	432	540	465	1371	810	587	1750	1019
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.41	0.06	0.52	0.56	0.49	0.10	0.39	0.19	0.51	0.30	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 16 (13%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 31.7
 Intersection Capacity Utilization 65.9%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr



Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) Noon

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (veh/h)	178	181	26	164	216	236	42	475	138	269	467	164
Future Volume (veh/h)	178	181	26	164	216	236	42	475	138	269	467	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1781	1850	1864	1864	1716	1820	1864	1919	1889	1919
Adj Flow Rate, veh/h	198	201	29	182	240	262	47	528	153	299	519	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	8	3	2	2	12	5	2	4	6	4
Cap, veh/h	272	350	366	247	280	834	501	681	440	785	1869	1033
Arrive On Green	0.11	0.19	0.19	0.07	0.15	0.15	0.05	0.20	0.20	0.75	1.00	1.00
Sat Flow, veh/h	1781	1870	1510	3417	1864	1580	1635	3458	1560	1827	3588	1618
Grp Volume(v), veh/h	198	201	29	182	240	262	47	528	153	299	519	182
Grp Sat Flow(s),veh/h/ln	1781	1870	1510	1709	1864	1580	1635	1729	1560	1827	1794	1618
Q Serve(g_s), s	11.2	11.7	1.8	6.3	15.1	3.4	1.5	17.4	2.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.2	11.7	1.8	6.3	15.1	3.4	1.5	17.4	2.8	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	350	366	247	280	834	501	681	440	785	1869	1033
V/C Ratio(X)	0.73	0.57	0.08	0.74	0.86	0.31	0.09	0.78	0.35	0.38	0.28	0.18
Avail Cap(c_a), veh/h	315	499	486	342	435	965	537	1009	588	785	1869	1033
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	44.4	35.1	54.5	49.7	5.4	11.3	45.7	14.1	9.0	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.6	0.0	2.8	6.1	0.1	0.0	8.4	2.2	0.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.5	0.7	2.8	7.4	1.5	0.5	8.2	2.0	2.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	45.0	35.1	57.3	55.8	5.4	11.3	54.1	16.3	9.1	0.4	0.4
LnGrp LOS	D	D	D	E	E	A	B	D	B	A	A	A
Approach Vol, veh/h		428			684			728			1000	
Approach Delay, s/veh		43.9			36.9			43.4			3.0	
Approach LOS		D			D			D			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.2	28.6	13.7	27.5	11.3	67.5	18.1	23.0				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 20	* 34	11.6	31.5	* 8.2	* 46	* 16	27.5				
Max Q Clear Time (g_c+I1), s	2.0	19.4	8.3	13.7	3.5	2.0	13.2	17.1				
Green Ext Time (p_c), s	0.1	2.3	0.0	0.3	0.0	2.7	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Improved (2024) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	3	0	14	68	1	24	21	857	57	27	831	2
Future Volume (vph)	3	0	14	68	1	24	21	857	57	27	831	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00		1.00		
Frt		0.850			0.855			0.991				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1113	0	3364	1442	0	1463	3488	0	1770	3471	0
Flt Permitted	0.950			0.950			0.294			0.265		
Satd. Flow (perm)	1762	1113	0	3355	1442	0	453	3488	0	493	3471	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1082			2618	
Travel Time (s)		18.9			12.9			21.1			51.0	
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	43%	2%	2%	9%	24%	3%	2%	2%	4%	2%
Adj. Flow (vph)	3	0	16	76	1	27	23	952	63	30	923	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	16	0	76	28	0	23	1015	0	30	925	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	22.0	22.0		26.0	26.0		72.0	72.0		72.0	72.0	
Total Split (%)	18.3%	18.3%		21.7%	21.7%		60.0%	60.0%		60.0%	60.0%	
Maximum Green (s)	16.4	16.4		20.1	20.1		66.2	66.2		66.5	66.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Improved (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	7.8	7.8		8.3	8.3		100.0	100.0		100.0	100.0	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.83	0.83		0.83	0.83	
v/c Ratio	0.03	0.22		0.33	0.29		0.06	0.35		0.07	0.32	
Control Delay	52.7	60.6		57.1	60.5		2.9	2.4		1.3	1.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.7	60.6		57.1	60.5		2.9	2.4		1.3	1.2	
LOS	D	E		E	E		A	A		A	A	
Approach Delay		59.4			58.0			2.4			1.2	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	2	12		29	21		1	30		2	35	
Queue Length 95th (ft)	13	36		54	52		m8	104		m4	32	
Internal Link Dist (ft)		474			583			1002			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	250	157		588	252		377	2907		411	2893	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.10		0.13	0.11		0.06	0.35		0.07	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 115 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 5.1
Intersection Capacity Utilization 42.5%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd



HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	2	200	11	7	14	167	708	2	19	652	95
Future Volume (vph)	109	2	200	11	7	14	167	708	2	19	652	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.98	0.98	1.00	0.99	1.00	1.00		0.99		0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.954		0.950	0.990		0.950			0.950		
Satd. Flow (prot)	1667	1676	1600	1664	1734	1567	3400	3500	0	1719	3471	1495
Flt Permitted	0.950	0.954		0.950	0.990		0.950			0.321		
Satd. Flow (perm)	1662	1672	1569	1629	1727	1545	3398	3500	0	578	3471	1476
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		9	9		2	1		10	10		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	5%	2%	2%	2%	3%	3%	50%	5%	4%	8%
Adj. Flow (vph)	121	2	222	12	8	16	186	787	2	21	724	106
Shared Lane Traffic (%)	49%			17%								
Lane Group Flow (vph)	62	61	222	10	10	16	186	789	0	21	724	106
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	25.0	19.0	19.0	18.0	25.0	53.0		18.0	46.0	30.0
Total Split (%)	25.0%	25.0%	20.8%	15.8%	15.8%	15.0%	20.8%	44.2%		15.0%	38.3%	25.0%
Maximum Green (s)	22.9	22.9	18.7	12.1	12.1	11.6	18.7	47.0		11.6	39.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)								0			0	
Act Effect Green (s)	10.8	10.8	27.3	8.9	8.9	12.0	16.5	85.6		90.7	72.1	82.9
Actuated g/C Ratio	0.09	0.09	0.23	0.07	0.07	0.10	0.14	0.71		0.76	0.60	0.69
v/c Ratio	0.42	0.41	0.61	0.08	0.08	0.10	0.40	0.32		0.04	0.35	0.10
Control Delay	59.7	59.2	39.5	53.4	53.3	35.6	51.2	12.1		5.1	14.5	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.7	59.2	39.5	53.4	53.3	35.6	51.2	12.1		5.1	14.5	6.7
LOS	E	E	D	D	D	D	D	B		A	B	A
Approach Delay		46.6			45.5			19.6			13.3	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	49	48	145	7	7	12	64	95		2	123	17
Queue Length 95th (ft)	94	92	170	26	26	25	112	265		13	241	54
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	347	349	398	194	202	215	566	2496		573	2086	1084
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.18	0.17	0.56	0.05	0.05	0.07	0.33	0.32		0.04	0.35	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 21.8

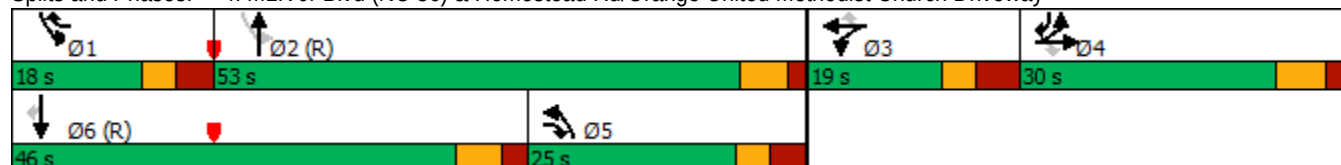
Intersection Capacity Utilization 64.2%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	580	568	19	20	20
Future Volume (vph)	25	580	568	19	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1639	1844	1837	0	1561	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1639	1844	1837	0	1561	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		658	840		813	
Travel Time (s)		12.8	16.4		22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	2%	2%	18%	2%	25%
Adj. Flow (vph)	28	644	631	21	22	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	644	652	0	44	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	580	568	19	20	20
Future Vol, veh/h	25	580	568	19	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	2	2	18	2	25
Mvmt Flow	28	644	631	21	22	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	652	0	0 1342 642
Stage 1	-	-	- 642 -
Stage 2	-	-	- 700 -
Critical Hdwy	4.19	-	- 5.42 5.95
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.281	-	- 3.518 3.525
Pot Cap-1 Maneuver	902	-	- 244 476
Stage 1	-	-	- 626 -
Stage 2	-	-	- 598 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	902	-	- 236 476
Mov Cap-2 Maneuver	-	-	- 236 -
Stage 1	-	-	- 607 -
Stage 2	-	-	- 598 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	902	-	-	-	316
HCM Lane V/C Ratio	0.031	-	-	-	0.141
HCM Control Delay (s)	9.1	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	541	3	1	500	27	3	4	2	23	0	78
Future Volume (vph)	58	541	3	1	500	27	3	4	2	23	0	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00							
Frt		0.999			0.992			0.970			0.850	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1753	1879	0	1770	1843	0	0	1483	0	1814	1592	0
Flt Permitted	0.377			0.411				0.888		0.752		
Satd. Flow (perm)	694	1879	0	766	1843	0	0	1338	0	1436	1592	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	4%	50%	2%	2%	2%	2%	4%
Adj. Flow (vph)	64	601	3	1	556	30	3	4	2	26	0	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	604	0	1	586	0	0	9	0	26	87	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	13.0	68.0		68.0	55.0		22.0	22.0		22.0	22.0	
Total Split (%)	14.4%	75.6%		75.6%	61.1%		24.4%	24.4%		24.4%	24.4%	
Maximum Green (s)	7.4	62.4		62.4	49.4		17.1	17.1		16.6	16.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	69.1	74.1		74.1	64.0			8.1		9.4	9.4	
Actuated g/C Ratio	0.77	0.82		0.82	0.71			0.09		0.10	0.10	

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) Noon
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.10	0.39		0.00	0.45			0.07		0.17	0.53	
Control Delay	3.1	3.9		3.0	9.3			37.2		38.3	49.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.1	3.9		3.0	9.3			37.2		38.3	49.3	
LOS	A	A		A	A			D		D	D	
Approach Delay		3.8			9.3			37.3			46.7	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	6	79		0	151			5		14	48	
Queue Length 95th (ft)	17	156		1	263			18		37	91	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	629	1546		630	1310			252		271	300	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.10	0.39		0.00	0.45			0.04		0.10	0.29	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.9
 Intersection Capacity Utilization 55.3%
 Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service B

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) Noon

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	541	3	1	500	27	3	4	2	23	0	78
Future Volume (veh/h)	58	541	3	1	500	27	3	4	2	23	0	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1919	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	64	601	3	1	556	30	3	4	2	26	0	87
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	206	1234	6	290	1206	65	67	54	19	213	0	138
Arrive On Green	0.07	0.64	0.63	0.12	0.69	0.68	0.08	0.07	0.07	0.08	0.00	0.07
Sat Flow, veh/h	1827	1937	10	1781	1758	95	190	744	267	1558	0	1751
Grp Volume(v), veh/h	64	0	604	1	0	586	9	0	0	26	0	87
Grp Sat Flow(s),veh/h/ln	1827	0	1947	1781	0	1853	1201	0	0	1558	0	1751
Q Serve(g_s), s	0.8	0.0	14.7	0.1	0.0	13.1	0.0	0.0	0.0	0.0	0.0	4.3
Cycle Q Clear(g_c), s	0.8	0.0	14.7	0.1	0.0	13.1	4.4	0.0	0.0	1.2	0.0	4.3
Prop In Lane	1.00		0.00	1.00		0.05	0.33		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	206	0	1240	0	0	1271	154	0	0	213	0	138
V/C Ratio(X)	0.31	0.00	0.49	0.00	0.00	0.46	0.06	0.00	0.00	0.12	0.00	0.63
Avail Cap(c_a), veh/h	242	0	1363	0	0	1271	309	0	0	385	0	331
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	8.6	0.0	0.0	6.5	38.7	0.0	0.0	38.8	0.0	40.4
Incr Delay (d2), s/veh	0.3	0.0	1.4	0.0	0.0	1.2	0.1	0.0	0.0	0.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.7	0.0	0.0	4.5	0.2	0.0	0.0	0.5	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	10.0	0.0	0.0	7.7	38.8	0.0	0.0	38.9	0.0	42.2
LnGrp LOS	C	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h		668			587			9			113	
Approach Delay, s/veh		11.4			7.7			38.8			41.4	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	62.3		12.1	11.2	66.7		12.1				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 62	* 62		* 17	7.4	49.4		* 17				
Max Q Clear Time (g_c+I1), s	2.1	16.7		6.3	2.8	15.1		6.4				
Green Ext Time (p_c), s	0.0	2.6		0.1	0.0	2.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) Noon

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	308	59	161	302	187	57	404	143	123	395	268
Future Volume (vph)	298	308	59	161	302	187	57	404	143	123	395	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		350
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	1.00		1.00		0.97	0.98	0.99		1.00		0.95
Frt		0.976				0.850		0.961				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1821	0	1725	1816	1544	1743	3277	0	1778	3522	1591
Flt Permitted	0.950			0.302			0.950			0.950		
Satd. Flow (perm)	1762	1821	0	547	1816	1502	1710	3277	0	1771	3522	1505
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	9		6	6		9	8		4	4		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	3%	2%
Adj. Flow (vph)	331	342	66	179	336	208	63	449	159	137	439	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	331	408	0	179	336	208	63	608	0	137	439	298
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				4		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	12.9
Total Split (s)	48.0	55.0		24.0	31.0	24.0	24.0	37.0		24.0	37.0	48.0
Total Split (%)	34.3%	39.3%		17.1%	22.1%	17.1%	17.1%	26.4%		17.1%	26.4%	34.3%
Maximum Green (s)	42.1	49.1		18.4	25.1	18.1	17.8	31.3		18.1	31.5	42.1
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	3.0
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	2.9
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	-1.9
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	31.6	50.6		63.7	32.1	47.6	10.3	40.9		15.4	48.7	82.2
Actuated g/C Ratio	0.23	0.36		0.46	0.23	0.34	0.07	0.29		0.11	0.35	0.59

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) Noon
12/23/2020

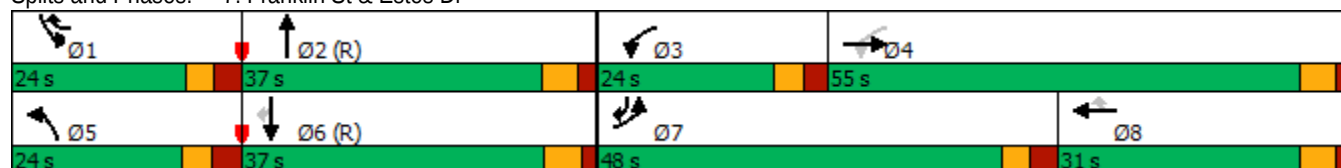
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.83	0.62		0.50	0.81	0.40	0.50	0.64		0.70	0.36	0.33
Control Delay	68.4	41.2		24.5	66.7	34.1	75.1	48.6		78.5	37.7	15.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.4	41.2		24.5	66.7	34.1	75.1	48.6		78.5	37.7	15.1
LOS	E	D		C	E	C	E	D		E	D	B
Approach Delay		53.4			46.9			51.1			36.4	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	289	294		87	285	131	56	263		122	165	133
Queue Length 95th (ft)	374	413		129	#482	206	104	352		192	232	185
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		350
Base Capacity (vph)	546	676		425	416	554	236	957		241	1224	1033
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.61	0.60		0.42	0.81	0.38	0.27	0.64		0.57	0.36	0.29

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 108 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 46.4
 Intersection Capacity Utilization 82.2%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 7: Franklin St & Estes Dr



Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) Noon

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	298	308	59	161	302	187	57	404	143	123	395	268
Future Volume (veh/h)	298	308	59	161	302	187	57	404	143	123	395	268
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1788	1788	1909	1894	1909
Adj Flow Rate, veh/h	331	342	66	179	336	208	63	449	159	137	439	298
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	3	2
Cap, veh/h	366	454	88	288	320	405	94	922	324	172	1491	1017
Arrive On Green	0.20	0.29	0.29	0.09	0.19	0.19	0.05	0.38	0.37	0.09	0.41	0.42
Sat Flow, veh/h	1818	1552	300	1641	1723	1439	1731	2457	862	1818	3599	1603
Grp Volume(v), veh/h	331	0	408	179	336	208	63	309	299	137	439	298
Grp Sat Flow(s),veh/h/ln	1818	0	1852	1641	1723	1439	1731	1698	1621	1818	1800	1603
Q Serve(g_s), s	24.9	0.0	28.0	10.5	26.0	17.0	5.0	19.5	19.8	10.3	11.4	11.7
Cycle Q Clear(g_c), s	24.9	0.0	28.0	10.5	26.0	17.0	5.0	19.5	19.8	10.3	11.4	11.7
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	366	0	542	288	320	405	94	637	609	172	1491	1017
V/C Ratio(X)	0.90	0.00	0.75	0.62	1.05	0.51	0.67	0.48	0.49	0.80	0.29	0.29
Avail Cap(c_a), veh/h	559	0	661	356	320	405	235	637	609	247	1491	1017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	45.0	33.2	57.0	42.4	65.0	33.4	33.6	62.1	27.4	11.6
Incr Delay (d2), s/veh	9.5	0.0	2.9	0.9	64.0	0.5	3.0	2.6	2.8	6.9	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.0	13.2	4.2	16.9	6.1	2.3	8.5	8.3	5.1	5.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	0.0	47.9	34.1	121.0	42.9	68.0	36.0	36.5	69.0	27.9	12.3
LnGrp LOS	E	A	D	C	F	D	E	D	D	E	C	B
Approach Vol, veh/h		739			723			671			874	
Approach Delay, s/veh		55.1			77.0			39.2			29.0	
Approach LOS		E			E			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.2	57.6	18.2	46.0	12.6	63.2	33.2	31.0				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	18.1	* 31	18.4	49.1	* 18	* 32	42.1	25.1				
Max Q Clear Time (g_c+I1), s	12.3	21.8	12.5	30.0	7.0	13.7	26.9	28.0				
Green Ext Time (p_c), s	0.1	1.7	0.1	1.5	0.0	2.3	0.4	0.0				

Intersection Summary

HCM 6th Ctrl Delay	49.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	37	871	18	0	900
Future Volume (vph)	0	37	871	18	0	900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			-2%
Storage Length (ft)	0	0		100	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3557	1591	0	3575
Flt Permitted						
Satd. Flow (perm)	0	1611	3557	1591	0	3575
Link Speed (mph)	25		35			35
Link Distance (ft)	471		432			1082
Travel Time (s)	12.8		8.4			21.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	41	968	20	0	1000
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	41	968	20	0	1000
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.1%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	37	871	18	0	900
Future Vol, veh/h	0	37	871	18	0	900
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	-1	-	-	-2
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	41	968	20	0	1000

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	484	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	529	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	529	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 529	-
HCM Lane V/C Ratio	-	- 0.078	-
HCM Control Delay (s)	-	- 12.4	-
HCM Lane LOS	-	- B	-
HCM 95th %tile Q(veh)	-	- 0.3	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	45	544	588	45	46	28
Future Volume (vph)	45	544	588	45	46	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			100	100	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		35	35		25	
Link Distance (ft)		913	658		374	
Travel Time (s)		17.8	12.8		10.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	604	653	50	51	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	604	653	50	51	31
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.4%
Analysis Period (min) 15

ICU Level of Service A

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	544	588	45	46	28
Future Vol, veh/h	45	544	588	45	46	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	604	653	50	51	31

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	703	0	0 1357 653
Stage 1	-	-	- 653 -
Stage 2	-	-	- 704 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	895	-	- 164 467
Stage 1	-	-	- 518 -
Stage 2	-	-	- 490 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	895	-	- 155 467
Mov Cap-2 Maneuver	-	-	- 155 -
Stage 1	-	-	- 489 -
Stage 2	-	-	- 490 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	29.4
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	895	-	-	-	155	467
HCM Lane V/C Ratio	0.056	-	-	-	0.33	0.067
HCM Control Delay (s)	9.3	-	-	-	39.2	13.3
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.3	0.2

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Improved (2024) PM
12/23/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	32	60	23	1359	830	5
Future Volume (vph)	32	60	23	1359	830	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1538	1656	3539	3502	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1538	1656	3539	3502	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	928			1413	1063	
Travel Time (s)	18.1			27.5	20.7	
Confl. Peds. (#/hr)	12		4			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	5%	9%	2%	3%	2%
Adj. Flow (vph)	36	67	26	1510	922	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	67	26	1510	928	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.6%
Analysis Period (min) 15

ICU Level of Service A

Aura Chapel Hill TIA
1: MLK Jr Blvd (NC 86) & Airport Rd

Improved (2024) PM
12/23/2020

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	60	23	1359	830	5
Future Vol, veh/h	32	60	23	1359	830	5
Conflicting Peds, #/hr	12	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	125	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	5	9	2	3	2
Mvmt Flow	36	67	26	1510	922	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1748	468	932
Stage 1	929	-	-
Stage 2	819	-	-
Critical Hdwy	6.84	7	4.28
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.35	2.29
Pot Cap-1 Maneuver	77	534	688
Stage 1	345	-	-
Stage 2	394	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	73	532	685
Mov Cap-2 Maneuver	197	-	-
Stage 1	331	-	-
Stage 2	392	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	685	-	197	532	-	-
HCM Lane V/C Ratio	0.037	-	0.18	0.125	-	-
HCM Control Delay (s)	10.5	-	27.3	12.7	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.4	-	-

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	255	57	201	317	446	67	1133	251	301	669	206
Future Volume (vph)	246	255	57	201	317	446	67	1133	251	301	669	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			1%			-2%	
Storage Length (ft)	225		350	300		500	150		250	225		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.96			
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3416	1853	1575	1761	3522	1575	1787	3540	1599
Flt Permitted	0.148			0.950			0.284			0.077		
Satd. Flow (perm)	276	1863	1583	3416	1853	1575	526	3522	1509	145	3540	1599
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1251			941			1063			453	
Travel Time (s)		24.4			18.3			20.7			8.8	
Confl. Peds. (#/hr)									9	9		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	273	283	63	223	352	496	74	1259	279	334	743	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	283	63	223	352	496	74	1259	279	334	743	229
Turn Type	D.P+P	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	8		4			8	6		2	2		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	11.9	12.5	12.8	12.4	12.5	12.8	12.8	34.0	12.4	12.8	18.0	11.9
Total Split (s)	23.0	37.9	12.8	18.1	33.0	27.0	12.8	57.0	18.1	27.0	71.2	23.0
Total Split (%)	16.4%	27.1%	9.1%	12.9%	23.6%	19.3%	9.1%	40.7%	12.9%	19.3%	50.9%	16.4%
Maximum Green (s)	18.1	32.4	7.0	12.7	27.5	21.2	7.0	51.0	12.7	21.2	65.2	18.1
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	1.9	1.7	2.8	2.4	1.7	2.8	2.8	1.7	2.4	2.8	1.7	1.9
Lost Time Adjust (s)	0.1	-0.5	-0.8	-0.4	-0.5	-0.8	-0.8	-1.0	-1.4	-0.8	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.9
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)								7.0				
Flash Dont Walk (s)								21.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)	45.5	33.7	46.5	11.9	27.5	50.0	74.5	52.0	65.9	74.5	66.7	89.8
Actuated g/C Ratio	0.32	0.24	0.33	0.08	0.20	0.36	0.53	0.37	0.47	0.53	0.48	0.64

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.97	0.63	0.12	0.77	0.97	0.88	0.21	0.96	0.39	0.98	0.44	0.22
Control Delay	85.9	55.2	33.7	80.5	94.9	47.4	15.5	60.4	13.9	88.3	16.5	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.9	55.2	33.7	80.5	94.9	47.4	15.5	60.4	13.9	88.3	16.5	8.9
LOS	F	E	C	F	F	D	B	E	B	F	B	A
Approach Delay		66.5			69.9			50.3			33.5	
Approach LOS		E			E			D			C	
Queue Length 50th (ft)	196	234	40	103	320	282	29	587	85	254	240	93
Queue Length 95th (ft)	#381	336	77	148	#515	#466	54	#741	123	#465	227	76
Internal Link Dist (ft)		1171			861			983			373	
Turn Bay Length (ft)	225		350	300		500	150		250	225		175
Base Capacity (vph)	281	447	525	319	370	562	348	1308	729	340	1685	1024
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.63	0.12	0.70	0.95	0.88	0.21	0.96	0.38	0.98	0.44	0.22

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 52.3
Intersection Capacity Utilization 95.0%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: D
ICU Level of Service F

Splits and Phases: 2: MLK Jr Blvd (NC 86) & Estes Dr

							
Ø2 (R)			Ø1			Ø3	Ø4
57 s			27 s			18.1 s	37.9 s
							
Ø5	Ø6 (R)					Ø7	Ø8
12.8 s	71.2 s					23 s	33 s

Aura Chapel Hill TIA
2: MLK Jr Blvd (NC 86) & Estes Dr

Improved (2024) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	255	57	201	317	446	67	1133	251	301	669	206
Future Volume (veh/h)	246	255	57	201	317	446	67	1133	251	301	669	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1864	1864	1864	1864	1864	1864	1949	1934	1949
Adj Flow Rate, veh/h	273	283	63	223	352	496	74	1259	279	334	743	229
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	2
Cap, veh/h	287	463	480	279	373	586	420	1313	722	372	1792	1000
Arrive On Green	0.13	0.25	0.25	0.08	0.20	0.20	0.05	0.37	0.37	0.34	0.98	0.96
Sat Flow, veh/h	1781	1870	1585	3445	1864	1580	1776	3542	1561	1856	3674	1636
Grp Volume(v), veh/h	273	283	63	223	352	496	74	1259	279	334	743	229
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1722	1864	1580	1776	1771	1561	1856	1837	1636
Q Serve(g_s), s	17.1	18.8	4.0	8.9	26.1	12.2	2.8	48.6	8.3	19.1	1.2	0.8
Cycle Q Clear(g_c), s	17.1	18.8	4.0	8.9	26.1	12.2	2.8	48.6	8.3	19.1	1.2	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	463	480	279	373	586	420	1313	722	372	1792	1000
V/C Ratio(X)	0.95	0.61	0.13	0.80	0.94	0.85	0.18	0.96	0.39	0.90	0.41	0.23
Avail Cap(c_a), veh/h	287	463	480	322	373	586	425	1316	724	372	1792	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	46.7	35.5	63.2	55.2	20.0	15.5	43.0	9.6	43.2	0.9	0.8
Incr Delay (d2), s/veh	40.0	1.7	0.0	10.0	32.1	10.6	0.1	16.8	1.6	23.0	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	8.9	1.6	4.3	15.5	10.7	1.1	23.9	2.9	11.3	0.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.4	48.4	35.5	73.2	87.3	30.6	15.6	59.8	11.2	66.2	1.6	1.3
LnGrp LOS	F	D	D	E	F	C	B	E	B	E	A	A
Approach Vol, veh/h		619			1071			1612			1306	
Approach Delay, s/veh		61.2			58.1			49.4			18.1	
Approach LOS		E			E			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.8	56.9	16.3	39.7	12.4	73.3	23.0	33.0				
Change Period (Y+Rc), s	* 6	* 6	5.4	5.5	* 5.8	* 6	* 4.9	5.5				
Max Green Setting (Gmax), s	* 21	* 51	12.7	32.4	* 7	* 65	* 18	27.5				
Max Q Clear Time (g_c+I1), s	21.1	50.6	10.9	20.8	4.8	3.2	19.1	28.1				
Green Ext Time (p_c), s	0.0	0.3	0.0	0.5	0.0	4.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	44.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Improved (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	24	7	27	108	1	34	14	1644	144	45	1069	18
Future Volume (vph)	24	7	27	108	1	34	14	1644	144	45	1069	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			-1%			0%	
Storage Length (ft)	100		0	375		0	150		0	225		0
Storage Lanes	1		0	2		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00				
Frt		0.882			0.854			0.988			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1643	0	3364	1488	0	1778	3503	0	1770	3532	0
Flt Permitted	0.950			0.950			0.207			0.068		
Satd. Flow (perm)	1736	1643	0	3364	1488	0	388	3503	0	127	3532	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			35			35	
Link Distance (ft)		554			663			1061			2618	
Travel Time (s)		18.9			12.9			20.7			51.0	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	2%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	27	8	30	120	1	38	16	1827	160	50	1188	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	38	0	120	39	0	16	1987	0	50	1208	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		3	3		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	12.6	12.6		12.9	12.9		27.8	27.8		17.5	17.5	
Total Split (s)	21.0	21.0		26.0	26.0		93.0	93.0		93.0	93.0	
Total Split (%)	15.0%	15.0%		18.6%	18.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	15.4	15.4		20.1	20.1		87.2	87.2		87.5	87.5	
Yellow Time (s)	3.0	3.0		3.6	3.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.6	2.6		2.3	2.3		1.6	1.6		1.3	1.3	
Lost Time Adjust (s)	-0.6	-0.6		-0.9	-0.9		-0.8	-0.8		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Minimum Gap (s)	1.0	1.0		1.0	1.0		6.0	6.0		6.0	6.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		15.0	15.0		15.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		45.0	45.0		45.0	45.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							15.0	15.0				

Aura Chapel Hill TIA
3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

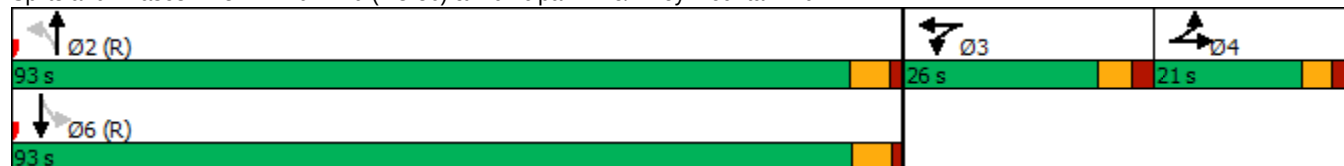
Improved (2024) PM
12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)							0	0				
Act Effect Green (s)	8.4	8.4		9.6	9.6		109.5	109.5		109.5	109.5	
Actuated g/C Ratio	0.06	0.06		0.07	0.07		0.78	0.78		0.78	0.78	
v/c Ratio	0.26	0.39		0.52	0.38		0.05	0.73		0.51	0.44	
Control Delay	68.6	74.4		70.9	72.7		3.4	5.5		31.5	7.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.6	74.4		70.9	72.7		3.4	5.5		31.5	7.6	
LOS	E	E		E	E		A	A		C	A	
Approach Delay		72.0			71.3			5.5			8.6	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)	24	34		55	35		2	171		21	381	
Queue Length 95th (ft)	56	72		87	73		m2	m279		m#65	36	
Internal Link Dist (ft)		474			583			981			2538	
Turn Bay Length (ft)	100			375			150			225		
Base Capacity (vph)	198	187		504	223		303	2739		99	2762	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.20		0.24	0.17		0.05	0.73		0.51	0.44	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 133 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 10.8
Intersection Capacity Utilization 68.2%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd



HCM 6th Edition methodology expects strict NEMA phasing.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	0	193	2	2	1	265	1421	0	7	916	195
Future Volume (vph)	207	0	193	2	2	1	265	1421	0	7	916	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-8%			2%			0%			0%	
Storage Length (ft)	125		0	125		0	525		0	250		375
Storage Lanes	1		1	2		1	2		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.97	0.95		0.98	1.00					0.99
Frt			0.850			0.850						0.850
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1748	1748	1647	1664	1752	1567	3433	3539	0	1770	3539	1583
Flt Permitted	0.950	0.950		0.950			0.950			0.109		
Satd. Flow (perm)	1743	1743	1597	1575	1752	1543	3430	3539	0	203	3539	1561
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			20			35			35	
Link Distance (ft)		1248			314			1137			1345	
Travel Time (s)		24.3			10.7			22.1			26.2	
Confl. Peds. (#/hr)	2		21	21		2	2		25	25		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	230	0	214	2	2	1	294	1579	0	8	1018	217
Shared Lane Traffic (%)	50%			10%								
Lane Group Flow (vph)	115	115	214	2	2	1	294	1579	0	8	1018	217
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		D.P+P	NA	pm+ov
Protected Phases	4	4	5	3	3	1	5	2		1	6	4
Permitted Phases			4			3				2		6
Detector Phase	4	4	5	3	3	1	5	2		1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.1	14.1	13.3	13.9	13.9	13.4	13.3	28.0		13.4	45.4	14.1
Total Split (s)	30.0	30.0	29.0	19.0	19.0	16.0	29.0	75.0		16.0	62.0	30.0
Total Split (%)	21.4%	21.4%	20.7%	13.6%	13.6%	11.4%	20.7%	53.6%		11.4%	44.3%	21.4%
Maximum Green (s)	22.9	22.9	22.7	12.1	12.1	9.6	22.7	69.0		9.6	55.6	22.9
Yellow Time (s)	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.2		3.0	4.2	4.5
All-Red Time (s)	2.6	2.6	3.3	3.9	3.9	3.4	3.3	1.8		3.4	2.2	2.6
Lost Time Adjust (s)	-2.1	-2.1	-1.3	-1.9	-1.9	-1.4	-1.3	-1.0		-1.4	-1.4	-2.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Minimum Gap (s)	1.0	1.0	1.0	2.0	2.0	2.0	1.0	6.0		2.0	6.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0		0.0	45.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)								7.0			7.0	
Flash Dont Walk (s)								15.0			32.0	
Pedestrian Calls (#/hr)								0			0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	14.7	14.7	45.0	8.9	8.9	10.2	30.3	107.1		110.5	77.2	92.0
Actuated g/C Ratio	0.10	0.10	0.32	0.06	0.06	0.07	0.22	0.76		0.79	0.55	0.66
v/c Ratio	0.63	0.63	0.41	0.02	0.02	0.01	0.40	0.58		0.03	0.52	0.21
Control Delay	74.4	74.4	33.3	62.0	62.0	45.0	41.5	8.0		5.1	22.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	74.4	74.4	33.3	62.0	62.0	45.0	41.5	8.0		5.1	22.0	8.7
LOS	E	E	C	E	E	D	D	A		A	C	A
Approach Delay		54.6			58.6			13.3			19.6	
Approach LOS		D			E			B			B	
Queue Length 50th (ft)	107	107	135	2	2	1	87	142		1	307	69
Queue Length 95th (ft)	170	170	182	11	11	5	162	506		8	422	110
Internal Link Dist (ft)		1168			234			1057			1265	
Turn Bay Length (ft)	125			125			525			250		375
Base Capacity (vph)	312	312	523	166	175	143	742	2708		284	1952	1084
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.37	0.37	0.41	0.01	0.01	0.01	0.40	0.58		0.03	0.52	0.20

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 71 (51%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 20.7

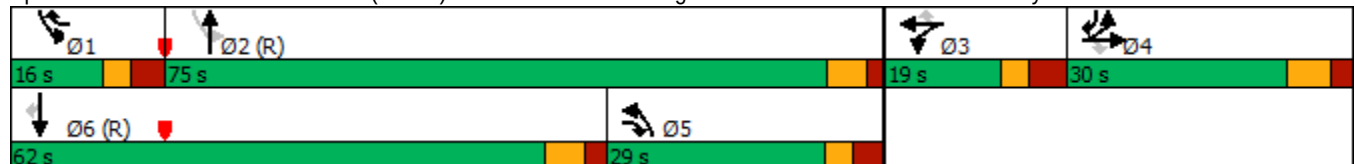
Intersection LOS: C

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway



HCM 6th Edition methodology expects strict NEMA phasing.

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	17	780	936	24	25	24
Future Volume (vph)	17	780	936	24	25	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		2%	1%		-5%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.934	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1752	1844	1848	0	1739	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1752	1844	1848	0	1739	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		630	840		813	
Travel Time (s)		12.3	16.4		22.2	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	867	1040	27	28	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	867	1067	0	55	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 61.0%
Analysis Period (min) 15

ICU Level of Service B

Intersection

Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	780	936	24	25	24
Future Vol, veh/h	17	780	936	24	25	24
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	2	1	-	-5	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	867	1040	27	28	27

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1067	0	0 1959 1055
Stage 1	-	-	- 1054 -
Stage 2	-	-	- 905 -
Critical Hdwy	4.12	-	- 5.42 5.72
Critical Hdwy Stg 1	-	-	- 4.42 -
Critical Hdwy Stg 2	-	-	- 4.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	653	-	- 120 317
Stage 1	-	-	- 449 -
Stage 2	-	-	- 507 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	653	-	- 117 317
Mov Cap-2 Maneuver	-	-	- 117 -
Stage 1	-	-	- 436 -
Stage 2	-	-	- 507 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	36.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	653	-	-	-	169
HCM Lane V/C Ratio	0.029	-	-	-	0.322
HCM Control Delay (s)	10.7	-	-	-	36.1
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3

Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	678	8	2	782	50	3	3	1	36	3	171
Future Volume (vph)	118	678	8	2	782	50	3	3	1	36	3	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			7%			-5%	
Storage Length (ft)	250		0	125		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			0.99		0.99	0.96	
Frt		0.998			0.991			0.981			0.852	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1787	1877	0	1770	1843	0	0	1719	0	1814	1566	0
Flt Permitted	0.122			0.306				0.883		0.753		
Satd. Flow (perm)	230	1877	0	569	1843	0	0	1542	0	1421	1566	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		961			940			384			262	
Travel Time (s)		18.7			18.3			10.5			7.1	
Confl. Peds. (#/hr)	2		2	2		2	6		4	4		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	131	753	9	2	869	56	3	3	1	40	3	190
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	762	0	2	925	0	0	7	0	40	193	0
Turn Type	D.P+P	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		2	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.6	21.6		21.6	21.6		11.9	11.9		20.4	20.4	
Total Split (s)	12.6	69.0		69.0	56.4		21.0	21.0		21.0	21.0	
Total Split (%)	14.0%	76.7%		76.7%	62.7%		23.3%	23.3%		23.3%	23.3%	
Maximum Green (s)	7.0	63.4		63.4	50.8		16.1	16.1		15.6	15.6	
Yellow Time (s)	3.0	4.0		4.0	3.8		3.0	3.0		3.5	3.5	
All-Red Time (s)	2.6	1.6		1.6	1.8		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.6	-0.6		-0.6	-0.6			0.1		-0.4	-0.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		9.0		9.0	9.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effect Green (s)	61.3	66.3		66.3	53.7			8.7		13.7	13.7	
Actuated g/C Ratio	0.68	0.74		0.74	0.60			0.10		0.15	0.15	
v/c Ratio	0.45	0.55		0.00	0.84			0.05		0.19	0.81	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	10.5	7.5		4.0	24.6			35.0		34.2	62.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.5	7.5		4.0	24.6			35.0		34.2	62.0	
LOS	B	A		A	C			C		C	E	
Approach Delay		8.0			24.6			35.0			57.3	
Approach LOS		A			C			C			E	
Queue Length 50th (ft)	19	172		0	410			4		20	105	
Queue Length 95th (ft)	41	265		2	#706			15		48	#197	
Internal Link Dist (ft)		881			860			304			182	
Turn Bay Length (ft)	250			125						100		
Base Capacity (vph)	288	1382		419	1099			274		252	278	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.45	0.55		0.00	0.84			0.03		0.16	0.69	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.1
Intersection Capacity Utilization 74.8%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection LOS: C
ICU Level of Service D

Splits and Phases: 6: Caswell Rd & Estes Dr



Aura Chapel Hill TIA
6: Caswell Rd & Estes Dr

Improved (2024) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	678	8	2	782	50	3	3	1	36	3	171
Future Volume (veh/h)	118	678	8	2	782	50	3	3	1	36	3	171
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1949	1949	1949	1870	1870	1870	1582	1582	1582	2067	2067	2067
Adj Flow Rate, veh/h	131	753	9	2	869	56	3	3	1	40	3	190
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	1102	13	290	1060	68	72	53	11	252	4	240
Arrive On Green	0.08	0.57	0.57	0.12	0.61	0.60	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1856	1921	23	1781	1738	112	111	386	83	1540	27	1691
Grp Volume(v), veh/h	131	0	762	2	0	925	7	0	0	40	0	193
Grp Sat Flow(s),veh/h/ln	1856	0	1944	1781	0	1850	579	0	0	1540	0	1718
Q Serve(g_s), s	2.1	0.0	24.7	0.1	0.0	35.1	0.0	0.0	0.0	0.0	0.0	9.8
Cycle Q Clear(g_c), s	2.1	0.0	24.7	0.1	0.0	35.1	9.8	0.0	0.0	2.9	0.0	9.8
Prop In Lane	1.00		0.01	1.00		0.06	0.43		0.14	1.00		0.98
Lane Grp Cap(c), veh/h	231	0	1115	0	0	1128	137	0	0	252	0	244
V/C Ratio(X)	0.57	0.00	0.68	0.00	0.00	0.82	0.05	0.00	0.00	0.16	0.00	0.79
Avail Cap(c_a), veh/h	237	0	1383	0	0	1128	188	0	0	308	0	305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	13.5	0.0	0.0	13.7	34.0	0.0	0.0	34.4	0.0	37.5
Incr Delay (d2), s/veh	1.8	0.0	3.4	0.0	0.0	6.7	0.1	0.0	0.0	0.1	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	10.5	0.0	0.0	14.4	0.1	0.0	0.0	0.8	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	16.9	0.0	0.0	20.4	34.0	0.0	0.0	34.5	0.0	45.8
LnGrp LOS	C	A	B	A	A	C	C	A	A	C	A	D
Approach Vol, veh/h		893			927			7			233	
Approach Delay, s/veh		18.6			20.4			34.0			43.9	
Approach LOS		B			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.6	56.6		17.8	12.3	59.9		17.8				
Change Period (Y+Rc), s	* 5.6	* 5.6		* 5.4	5.6	5.6		* 5.4				
Max Green Setting (Gmax), s	* 63	* 63		* 16	7.0	50.8		* 16				
Max Q Clear Time (g_c+I1), s	2.1	26.7		11.8	4.1	37.1		11.8				
Green Ext Time (p_c), s	0.0	3.7		0.2	0.0	4.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	22.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) PM

12/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	376	69	191	348	249	68	751	191	120	564	453
Future Volume (vph)	346	376	69	191	348	249	68	751	191	120	564	453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			5%			3%			-1%	
Storage Length (ft)	550		0	150		0	150		0	300		350
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	0.99				0.97	0.97	0.99		0.99		0.91
Frt		0.977				0.850		0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1778	1820	0	1725	1816	1544	1743	3339	0	1761	3557	1591
Flt Permitted	0.950			0.203			0.950			0.950		
Satd. Flow (perm)	1763	1820	0	369	1816	1503	1692	3339	0	1744	3557	1450
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2406			987			1738			1202	
Travel Time (s)		46.9			19.2			33.9			23.4	
Confl. Peds. (#/hr)	8		13	13		8	15		17	17		15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	384	418	77	212	387	277	76	834	212	133	627	503
Shared Lane Traffic (%)												
Lane Group Flow (vph)	384	495	0	212	387	277	76	1046	0	133	627	503
Turn Type	Prot	NA		D,P+P	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				4		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.9	33.9		12.6	30.9	12.9	13.2	35.7		12.9	21.5	12.9
Total Split (s)	38.6	59.7		17.6	38.7	19.6	18.1	53.1		19.6	54.6	38.6
Total Split (%)	25.7%	39.8%		11.7%	25.8%	13.1%	12.1%	35.4%		13.1%	36.4%	25.7%
Maximum Green (s)	32.7	53.8		12.0	32.8	13.7	11.9	47.4		13.7	49.1	32.7
Yellow Time (s)	3.0	3.9		3.0	3.9	3.0	3.0	3.7		3.0	3.9	3.0
All-Red Time (s)	2.9	2.0		2.6	2.0	2.9	3.2	2.0		2.9	1.6	2.9
Lost Time Adjust (s)	-0.9	-0.9		-0.6	-0.9	-0.9	-1.2	-0.7		-0.9	-0.5	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.9
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		21.0			18.0			23.0			9.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	33.4	54.3		66.7	33.3	47.2	11.0	49.4		13.9	52.3	84.0
Actuated g/C Ratio	0.22	0.36		0.44	0.22	0.31	0.07	0.33		0.09	0.35	0.56

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.97	0.75		0.77	0.96	0.58	0.60	0.95		0.82	0.51	0.60
Control Delay	95.4	50.3		43.8	93.5	44.7	86.2	67.1		100.9	40.8	22.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	95.4	50.3		43.8	93.5	44.7	86.2	67.1		100.9	40.8	22.8
LOS	F	D		D	F	D	F	E		F	D	C
Approach Delay		70.0			66.0			68.4			40.0	
Approach LOS		E			E			E			D	
Queue Length 50th (ft)	376	422		120	377	213	73	533		129	257	280
Queue Length 95th (ft)	#586	565		#197	#582	306	129	#684		#238	325	396
Internal Link Dist (ft)		2326			907			1658			1122	
Turn Bay Length (ft)	550			150			150			300		350
Base Capacity (vph)	398	663		278	407	483	152	1098		171	1240	843
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.96	0.75		0.76	0.95	0.57	0.50	0.95		0.78	0.51	0.60

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 104 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 59.6
 Intersection Capacity Utilization 88.6%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 7: Franklin St & Estes Dr

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19.6 s	53.1 s	17.6 s	59.7 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
18.1 s	54.6 s	38.6 s	38.7 s

Aura Chapel Hill TIA
7: Franklin St & Estes Dr

Improved (2024) PM

12/23/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	376	69	191	348	249	68	751	191	120	564	453
Future Volume (veh/h)	346	376	69	191	348	249	68	751	191	120	564	453
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1909	1909	1909	1723	1723	1723	1817	1817	1817	1894	1909	1909
Adj Flow Rate, veh/h	384	418	77	212	387	277	76	834	212	133	627	503
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	2	2
Cap, veh/h	407	571	105	295	387	456	107	885	225	165	1286	907
Arrive On Green	0.22	0.36	0.36	0.08	0.22	0.22	0.06	0.33	0.32	0.09	0.35	0.35
Sat Flow, veh/h	1818	1565	288	1641	1723	1435	1731	2709	689	1804	3628	1579
Grp Volume(v), veh/h	384	0	495	212	387	277	76	531	515	133	627	503
Grp Sat Flow(s),veh/h/ln	1818	0	1854	1641	1723	1435	1731	1726	1671	1804	1814	1579
Q Serve(g_s), s	31.2	0.0	34.7	12.3	33.7	24.5	6.5	44.9	45.0	10.8	20.2	30.2
Cycle Q Clear(g_c), s	31.2	0.0	34.7	12.3	33.7	24.5	6.5	44.9	45.0	10.8	20.2	30.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	676	295	387	456	107	564	546	165	1286	907
V/C Ratio(X)	0.94	0.00	0.73	0.72	1.00	0.61	0.71	0.94	0.94	0.81	0.49	0.55
Avail Cap(c_a), veh/h	407	0	676	295	387	456	151	564	546	176	1286	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.3	0.0	41.4	31.8	58.1	43.5	69.0	49.1	49.3	66.8	37.8	20.4
Incr Delay (d2), s/veh	30.1	0.0	3.6	7.2	45.6	1.7	3.4	26.0	26.7	20.4	1.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.6	0.0	16.5	5.4	19.5	8.9	3.0	23.2	22.6	5.9	9.3	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.3	0.0	45.0	38.9	103.8	45.2	72.4	75.2	76.0	87.3	39.1	22.9
LnGrp LOS	F	A	D	D	F	D	E	E	E	F	D	C
Approach Vol, veh/h		879			876			1122			1263	
Approach Delay, s/veh		63.5			69.6			75.3			37.7	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.7	54.0	17.6	59.7	14.3	58.4	38.6	38.7				
Change Period (Y+Rc), s	5.9	* 5.7	5.6	5.9	* 6.2	* 5.7	5.9	5.9				
Max Green Setting (Gmax), s	13.7	* 47	12.0	53.8	* 12	* 49	32.7	32.8				
Max Q Clear Time (g_c+I1), s	12.8	47.0	14.3	36.7	8.5	32.2	33.2	35.7				
Green Ext Time (p_c), s	0.0	0.2	0.0	1.8	0.0	3.6	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	60.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Aura Chapel Hill TIA
8: MLK Jr Blvd (NC 86) & Future Access #1

Improved (2024) PM
12/23/2020

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	34	1805	25	0	1176
Future Volume (vph)	0	34	1805	25	0	1176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			-2%
Storage Length (ft)	0	0		100	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3557	1591	0	3575
Flt Permitted						
Satd. Flow (perm)	0	1611	3557	1591	0	3575
Link Speed (mph)	25		35			35
Link Distance (ft)	522		453			1061
Travel Time (s)	14.2		8.8			20.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	38	2006	28	0	1307
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	2006	28	0	1307
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.9%
Analysis Period (min) 15

ICU Level of Service B

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	34	1805	25	0	1176
Future Vol, veh/h	0	34	1805	25	0	1176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	-1	-	-	-2
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	2006	28	0	1307

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	1003	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	240	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	240	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 240	-
HCM Lane V/C Ratio	-	- 0.157	-
HCM Control Delay (s)	-	- 22.8	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0.5	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	754	941	51	37	26
Future Volume (vph)	55	754	941	51	37	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			100	100	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		35	35		25	
Link Distance (ft)		941	630		397	
Travel Time (s)		18.3	12.3		10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	61	838	1046	57	41	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	838	1046	57	41	29
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.5% ICU Level of Service B
Analysis Period (min) 15

Intersection

Int Delay, s/veh	3.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	754	941	51	37	26
Future Vol, veh/h	55	754	941	51	37	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	838	1046	57	41	29

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1103	0	0 2006 1046
Stage 1	-	-	- 1046 -
Stage 2	-	-	- 960 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	633	-	- 65 277
Stage 1	-	-	- 338 -
Stage 2	-	-	- 372 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	633	-	- 59 277
Mov Cap-2 Maneuver	-	-	- 59 -
Stage 1	-	-	- 306 -
Stage 2	-	-	- 372 -

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	97.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	633	-	-	-	59	277
HCM Lane V/C Ratio	0.097	-	-	-	0.697	0.104
HCM Control Delay (s)	11.3	-	-	-	152	19.5
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0.3	-	-	-	3	0.3

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	34	88	116	64	26	69	78
Average Queue (ft)	4	40	40	4	1	5	8
95th Queue (ft)	21	72	86	30	14	35	41
Link Distance (ft)	882			1381	1381	988	988
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)		0	1	0			
Queuing Penalty (veh)		0	2	0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	324	626	292	229	287	234	108	281	317	324	520	538
Average Queue (ft)	200	269	62	104	117	96	27	154	175	206	262	285
95th Queue (ft)	332	511	180	193	223	186	71	250	277	331	439	447
Link Distance (ft)		1199			1497			988	988		1417	1417
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	150		200	150			225		
Storage Blk Time (%)	6	18		4	5	1		11		8	11	
Queuing Penalty (veh)	21	61		16	18	3		4		37	38	

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	B14
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR	T
Maximum Queue (ft)	19	75	140	177	109	57	158	174	59	196	196	111
Average Queue (ft)	2	14	50	96	38	9	47	55	13	67	63	4
95th Queue (ft)	13	51	116	159	84	36	119	133	41	149	144	109
Link Distance (ft)		494			614		1417	1417		2547	2547	1073
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100		375	375		150			225			
Storage Blk Time (%)		0					0			0		
Queuing Penalty (veh)		0					0			0		

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	B14
Directions Served	T
Maximum Queue (ft)	114
Average Queue (ft)	4
95th Queue (ft)	108
Link Distance (ft)	1073
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LT	R	L	L	T	TR	L	T	T
Maximum Queue (ft)	196	217	267	20	29	101	114	150	154	20	365	328
Average Queue (ft)	75	117	131	1	2	31	56	49	46	2	218	194
95th Queue (ft)	165	188	238	10	13	79	100	115	114	12	331	306
Link Distance (ft)		1158	1158		260			1073	1073		1268	1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125		525	525			250		
Storage Blk Time (%)	2	8									4	0
Queuing Penalty (veh)	2	9									0	0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB
Directions Served	R
Maximum Queue (ft)	110
Average Queue (ft)	32
95th Queue (ft)	82
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	88	67
Average Queue (ft)	8	19
95th Queue (ft)	45	50
Link Distance (ft)	1497	778
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	TR	LTR	L	TR
Maximum Queue (ft)	124	278	348	69	116	190
Average Queue (ft)	55	111	132	23	30	86
95th Queue (ft)	101	227	275	56	75	156
Link Distance (ft)		890	877	349		220
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	250				100	
Storage Blk Time (%)		1	8		0	8
Queuing Penalty (veh)		1	0		0	4

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	478	442	198	320	163	108	218	222	198	333	376
Average Queue (ft)	264	225	61	138	63	40	127	126	81	197	215
95th Queue (ft)	414	381	141	256	137	86	197	202	156	298	327
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)	0	0	0	11		0	4			1	
Queuing Penalty (veh)	0	0	0	12		1	2			1	

Network Summary

Network wide Queuing Penalty: 232

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	47	68	68	42	23	25	40
Average Queue (ft)	15	30	25	2	1	1	2
95th Queue (ft)	40	54	57	17	12	12	17
Link Distance (ft)	882			1381	1381	988	988
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)			0	0			
Queuing Penalty (veh)			0	0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	233	260	69	242	358	274	80	230	247	211	176	234
Average Queue (ft)	105	120	15	97	146	117	27	117	133	105	64	100
95th Queue (ft)	184	211	46	184	272	219	66	202	219	188	136	181
Link Distance (ft)		1199			1497			988	988		1417	1417
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	150		200	150			225		
Storage Blk Time (%)	0	1		2	13	1		4		0	0	
Queuing Penalty (veh)	0	2		9	45	4		2		1	0	

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	26	92	53	110	91	64	117	142	46	127	134
Average Queue (ft)	2	24	16	42	29	11	32	36	13	42	41
95th Queue (ft)	15	68	43	85	71	41	82	96	38	102	101
Link Distance (ft)		494			614		1417	1417		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)		1					0				
Queuing Penalty (veh)		0					0				

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	107	147	188	14	59	48	104	125	168	179	34	210
Average Queue (ft)	16	50	80	1	16	12	45	65	66	70	7	119
95th Queue (ft)	65	112	158	8	46	39	93	106	144	152	24	196
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	0	1										0
Queuing Penalty (veh)	0	0										0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	198	84
Average Queue (ft)	89	24
95th Queue (ft)	178	63
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	98	4	60
Average Queue (ft)	7	0	19
95th Queue (ft)	48	4	52
Link Distance (ft)	1497	778	778
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	TR	LTR	L	TR
Maximum Queue (ft)	70	141	223	54	56	132
Average Queue (ft)	23	50	74	9	17	51
95th Queue (ft)	54	116	170	36	45	103
Link Distance (ft)		890	877	349		220
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250				100	
Storage Blk Time (%)			2		0	2
Queuing Penalty (veh)			0		0	0

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	371	345	250	412	243	145	274	293	201	277	320
Average Queue (ft)	212	191	105	191	104	41	152	160	95	147	182
95th Queue (ft)	323	315	218	324	196	98	240	253	171	243	292
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)			2	23			10			0	
Queuing Penalty (veh)			6	35			4			0	

Network Summary

Network wide Queuing Penalty: 109

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	92	78	51	74	76	46	45
Average Queue (ft)	29	30	11	8	8	3	4
95th Queue (ft)	75	57	39	40	42	23	27
Link Distance (ft)	882			1381	1381	988	988
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)	1	0		0			
Queuing Penalty (veh)	1	0		0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	311	340	99	250	1508	300	250	633	661	316	357	359
Average Queue (ft)	172	192	36	179	955	285	94	402	424	195	144	159
95th Queue (ft)	282	305	82	308	1739	353	250	569	584	310	315	306
Link Distance (ft)		1199			1497			988	988		1417	1417
Upstream Blk Time (%)					6							
Queuing Penalty (veh)					51							
Storage Bay Dist (ft)	225		350	150		200	150			225		
Storage Blk Time (%)	5	6		11	53	41		39		12	1	
Queuing Penalty (veh)	16	17		76	307	189		26		37	3	

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	67	84	121	147	98	56	332	355	95	230	245
Average Queue (ft)	21	33	26	68	33	8	131	151	35	79	83
95th Queue (ft)	54	74	77	125	78	38	258	288	76	195	203
Link Distance (ft)		494			614		1417	1417		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)	0	1					4			0	
Queuing Penalty (veh)	0	0					1			0	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LT	R	L	L	T	TR	L	T	T
Maximum Queue (ft)	148	176	214	34	18	160	172	282	280	20	320	300
Average Queue (ft)	61	106	85	4	2	85	102	109	108	3	165	137
95th Queue (ft)	139	167	177	21	13	144	158	234	236	13	277	248
Link Distance (ft)		1158	1158		260			1073	1073		1268	1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125		525	525			250		
Storage Blk Time (%)	1	6									2	
Queuing Penalty (veh)	1	6									0	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB
Directions Served	R
Maximum Queue (ft)	168
Average Queue (ft)	56
95th Queue (ft)	127
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	WB	B11	B210	SB
Directions Served	LT	TR	T	T	LR
Maximum Queue (ft)	25	523	184	94	85
Average Queue (ft)	1	169	28	12	24
95th Queue (ft)	19	666	189	167	72
Link Distance (ft)	1497	778	437	890	778
Upstream Blk Time (%)		7	1	0	
Queuing Penalty (veh)		60	13	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	117	222	57	427	39	92	193
Average Queue (ft)	49	87	2	193	7	26	97
95th Queue (ft)	93	179	34	372	28	68	164
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		0		13		0	11
Queuing Penalty (veh)		0		0		1	4

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	458	430	250	596	335	250	481	487	250	523	599
Average Queue (ft)	276	240	161	287	162	88	313	314	105	292	383
95th Queue (ft)	414	381	292	507	280	229	443	444	195	470	568
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)	0	0	7	40		0	37		0	6	
Queuing Penalty (veh)	0	0	19	73		1	20		0	7	

Network Summary

Network wide Queuing Penalty: 927

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	35	96	97	71	43	67	84
Average Queue (ft)	5	41	39	5	2	6	12
95th Queue (ft)	22	74	78	33	19	40	54
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)		0	0	0			
Queuing Penalty (veh)		0	1	0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	325	569	292	131	145	242	260	124	238	244	126	324
Average Queue (ft)	205	258	62	61	76	115	108	28	129	135	49	203
95th Queue (ft)	339	462	181	112	128	205	210	80	210	220	100	325
Link Distance (ft)		1186				813			980	980		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	300	300		300	150			250	225
Storage Blk Time (%)	6	18				0	0		6	0		9
Queuing Penalty (veh)	25	63				0	1		2	0		45

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB	B8
Directions Served	T	T	R	T
Maximum Queue (ft)	420	424	275	6
Average Queue (ft)	220	228	104	0
95th Queue (ft)	376	378	268	5
Link Distance (ft)	411	411		944
Upstream Blk Time (%)	0	0		
Queuing Penalty (veh)	4	3		
Storage Bay Dist (ft)			175	
Storage Blk Time (%)	7	16	0	
Queuing Penalty (veh)	27	36	0	

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	66	160	197	120	58	165	178	53	212	213
Average Queue (ft)	1	10	55	99	44	10	53	63	13	69	65
95th Queue (ft)	10	38	129	171	96	38	125	143	39	161	159
Link Distance (ft)		494			614		944	944		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)		0					0			0	
Queuing Penalty (veh)		0					0			0	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LT	R	L	L	T	TR	L	T	T
Maximum Queue (ft)	188	221	311	23	21	116	126	162	159	22	388	356
Average Queue (ft)	81	122	139	1	2	38	62	56	54	4	219	200
95th Queue (ft)	169	195	254	12	14	89	108	131	127	16	343	323
Link Distance (ft)		1158	1158		260			1073	1073		1268	1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125		525	525			250		
Storage Blk Time (%)	2	10									5	0
Queuing Penalty (veh)	2	11									0	0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB
Directions Served	R
Maximum Queue (ft)	109
Average Queue (ft)	34
95th Queue (ft)	82
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	36	67
Average Queue (ft)	8	23
95th Queue (ft)	31	54
Link Distance (ft)		778
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	125	291	6	328	65	80	175
Average Queue (ft)	55	105	1	133	23	30	83
95th Queue (ft)	102	220	7	265	56	68	147
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		0		8		0	8
Queuing Penalty (veh)		1		0		0	3

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	514	480	213	302	155	116	222	222	222	365	375
Average Queue (ft)	274	232	66	145	59	40	132	131	84	214	235
95th Queue (ft)	441	391	142	253	124	90	201	207	166	323	348
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)	0	0	0	13		0	6			2	
Queuing Penalty (veh)	1	0	0	13		0	3			2	

Network Summary

Network wide Queuing Penalty: 244

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	52	70	75	34	41	31	43
Average Queue (ft)	16	31	26	2	3	1	3
95th Queue (ft)	45	55	59	19	21	16	22
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)			0	0			
Queuing Penalty (veh)			0	0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	223	287	99	115	167	308	278	156	244	246	161	244
Average Queue (ft)	109	114	14	48	69	144	120	33	117	119	48	118
95th Queue (ft)	190	217	59	96	125	248	219	91	205	208	106	204
Link Distance (ft)		1185				820			980	980		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	300	300		300	150			250	225
Storage Blk Time (%)	0	1				0	0	0	4	0	0	1
Queuing Penalty (veh)	1	3				1	0	0	2	0	0	2

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	263	200	169
Average Queue (ft)	72	82	42
95th Queue (ft)	172	155	112
Link Distance (ft)	354	354	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			175
Storage Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	1	0

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	26	81	64	97	79	68	184	196	44	140	134
Average Queue (ft)	2	21	19	40	26	11	44	47	13	40	42
95th Queue (ft)	13	62	49	80	66	41	121	127	37	104	106
Link Distance (ft)		494			614		999	999		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)		0					1				
Queuing Penalty (veh)		0					0				

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	113	143	216	8	59	59	118	128	167	181	40	244
Average Queue (ft)	15	53	84	1	15	15	46	68	71	72	8	131
95th Queue (ft)	61	114	174	7	44	47	97	115	154	160	28	211
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	0	1										0
Queuing Penalty (veh)	0	0										0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	227	96
Average Queue (ft)	105	28
95th Queue (ft)	195	73
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	48	2	72
Average Queue (ft)	8	0	27
95th Queue (ft)	33	2	60
Link Distance (ft)		778	778
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	72	157	8	251	58	70	118
Average Queue (ft)	22	57	0	90	10	18	53
95th Queue (ft)	54	131	5	196	38	50	101
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)				3			2
Queuing Penalty (veh)				0			0

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	387	420	175	502	227	174	292	307	209	302	342
Average Queue (ft)	218	218	118	253	97	55	169	179	102	168	204
95th Queue (ft)	347	363	208	446	185	139	265	279	183	267	313
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)			3	29		0	14			0	
Queuing Penalty (veh)			8	46		0	7			0	

Network Summary

Network wide Queuing Penalty: 72

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	92	68	53	60	81	46	60
Average Queue (ft)	30	30	10	7	7	3	5
95th Queue (ft)	72	59	37	35	40	23	31
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)	0		0				
Queuing Penalty (veh)	0		0				

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	B9	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	T	L	T	T	R
Maximum Queue (ft)	315	518	244	158	400	886	400	395	250	625	639	350
Average Queue (ft)	203	225	45	74	173	529	320	79	93	401	412	218
95th Queue (ft)	335	443	158	131	406	981	480	368	247	579	598	439
Link Distance (ft)		1186				848		579		980	980	
Upstream Blk Time (%)						11		1				
Queuing Penalty (veh)						98		11				
Storage Bay Dist (ft)	225		350	300	300		300		150			250
Storage Blk Time (%)	15	5				30	15			43	31	0
Queuing Penalty (veh)	45	15				190	73			29	77	0

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB	SB	B8	B8
Directions Served	L	T	T	R	T	T
Maximum Queue (ft)	324	412	326	194	27	8
Average Queue (ft)	230	141	131	51	1	0
95th Queue (ft)	341	327	259	127	15	8
Link Distance (ft)		376	376		978	978
Upstream Blk Time (%)		2	0			
Queuing Penalty (veh)		10	1			
Storage Bay Dist (ft)	225			175		
Storage Blk Time (%)	18	1	2	0		
Queuing Penalty (veh)	60	1	3	0		

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	B8	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	T	L	T	TR
Maximum Queue (ft)	68	118	115	152	106	57	394	405	6	125	272	292
Average Queue (ft)	22	37	34	73	41	7	188	208	0	39	86	91
95th Queue (ft)	56	86	88	134	92	37	351	373	5	96	219	233
Link Distance (ft)		494			614		978	978	376		2547	2547
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100		375	375		150				225		
Storage Blk Time (%)	0	1					10				1	
Queuing Penalty (veh)	0	0					1				0	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	156	190	220	3	30	24	166	173	334	344	56	381
Average Queue (ft)	66	105	96	0	4	2	91	106	114	118	4	192
95th Queue (ft)	148	170	187	3	19	15	152	161	261	267	39	319
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	2	6							0			4
Queuing Penalty (veh)	2	6							0			0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	338	166
Average Queue (ft)	165	59
95th Queue (ft)	296	132
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	EB	WB	B11	SB
Directions Served	L	T	TR	T	LR
Maximum Queue (ft)	31	6	238	42	86
Average Queue (ft)	9	0	38	2	36
95th Queue (ft)	32	4	288	44	72
Link Distance (ft)		579	778	437	778
Upstream Blk Time (%)			1		
Queuing Penalty (veh)			7		
Storage Bay Dist (ft)	150				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	150	306	20	443	42	103	212
Average Queue (ft)	55	112	1	206	6	27	108
95th Queue (ft)	115	236	10	393	28	67	183
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							1
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		1		14		0	14
Queuing Penalty (veh)		1		0		0	5

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	506	557	250	826	544	250	473	485	348	530	620
Average Queue (ft)	292	318	193	432	188	101	321	330	128	304	396
95th Queue (ft)	448	499	311	810	436	249	446	456	255	478	583
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)				2	1						
Queuing Penalty (veh)				0	0						
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)	0	1	16	53		0	39		0	7	
Queuing Penalty (veh)	0	3	53	101		0	22		1	8	

Network Summary

Network wide Queuing Penalty: 826

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	32	89	110	94	37	71	106
Average Queue (ft)	4	42	41	6	2	5	11
95th Queue (ft)	19	75	83	41	21	32	53
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)		0	1	0			
Queuing Penalty (veh)		0	3	0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	324	621	355	155	164	261	203	126	258	255	124	324
Average Queue (ft)	203	263	65	71	86	121	97	30	140	146	52	236
95th Queue (ft)	332	501	196	130	144	215	180	78	224	230	100	351
Link Distance (ft)		1186				817			980	980		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	300	300		300	150			250	225
Storage Blk Time (%)	7	15				0	0	0	7	0		17
Queuing Penalty (veh)	26	54				1	0	0	3	0		84

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	424	422	275
Average Queue (ft)	238	240	103
95th Queue (ft)	399	390	267
Link Distance (ft)	412	412	
Upstream Blk Time (%)	1	1	
Queuing Penalty (veh)	4	4	
Storage Bay Dist (ft)			175
Storage Blk Time (%)	7	17	0
Queuing Penalty (veh)	30	39	0

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	B14
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR	T
Maximum Queue (ft)	19	57	154	178	112	63	187	199	49	200	180	6
Average Queue (ft)	1	11	50	94	42	9	58	65	12	65	62	0
95th Queue (ft)	9	41	119	162	91	37	137	147	37	153	146	6
Link Distance (ft)		494			614		944	944		2547	2547	1073
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100		375	375		150			225			
Storage Blk Time (%)							1			0		
Queuing Penalty (veh)							0			0		

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LT	R	L	L	T	TR	L	T	T
Maximum Queue (ft)	182	220	314	25	24	106	125	175	174	26	406	397
Average Queue (ft)	75	116	140	3	2	35	62	53	48	4	229	212
95th Queue (ft)	159	187	262	16	12	85	109	130	126	17	356	344
Link Distance (ft)		1158	1158		260			1073	1073		1268	1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125		525	525			250		
Storage Blk Time (%)	2	8									6	0
Queuing Penalty (veh)	2	8									1	0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB
Directions Served	R
Maximum Queue (ft)	90
Average Queue (ft)	28
95th Queue (ft)	70
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	38	68
Average Queue (ft)	8	27
95th Queue (ft)	32	58
Link Distance (ft)		778
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	161	295	12	335	69	99	207
Average Queue (ft)	63	124	1	151	24	29	85
95th Queue (ft)	126	251	7	297	57	75	157
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		1		10		0	8
Queuing Penalty (veh)		2		0		0	3

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	513	503	228	316	152	102	228	240	196	358	408
Average Queue (ft)	293	250	72	160	59	42	137	134	83	224	244
95th Queue (ft)	457	432	165	269	122	86	212	212	156	328	358
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)	1	0	0	16			7			2	
Queuing Penalty (veh)	4	0	1	17			4			2	

Intersection: 8: MLK Jr Blvd (NC 86) & Future Access #1

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	62	6	91	95
Average Queue (ft)	27	0	5	4
95th Queue (ft)	53	5	46	48
Link Distance (ft)	522	412	944	944
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Estes Dr & Future Access #2

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	211	11	120
Average Queue (ft)	33	0	47
95th Queue (ft)	127	5	93
Link Distance (ft)	817	608	340
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 292

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	55	65	69	25	12	20	44
Average Queue (ft)	16	29	25	2	1	1	3
95th Queue (ft)	45	53	60	14	8	10	20
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	212	248	60	140	183	308	247	82	229	227	116	271
Average Queue (ft)	111	124	15	56	75	152	109	26	112	117	45	137
95th Queue (ft)	190	216	47	107	133	263	196	64	189	197	93	233
Link Distance (ft)		1185				824			980	980		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	300	300		300	150			250	225
Storage Blk Time (%)	1	1				1			3	0		2
Queuing Penalty (veh)	1	2				3			1	0		4

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	178	165	131
Average Queue (ft)	56	68	38
95th Queue (ft)	130	132	95
Link Distance (ft)	354	354	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			175
Storage Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	0	0

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	88	64	102	92	53	150	160	52	163	145
Average Queue (ft)	3	21	19	39	29	10	37	41	14	38	40
95th Queue (ft)	16	64	49	82	69	35	102	109	41	105	104
Link Distance (ft)		494			614		998	998		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)		1					0			0	
Queuing Penalty (veh)		0					0			0	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	102	129	219	17	53	57	118	140	178	182	35	231
Average Queue (ft)	16	52	84	1	16	15	44	69	72	75	7	134
95th Queue (ft)	61	111	170	8	45	46	96	116	152	157	24	208
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	0	1										0
Queuing Penalty (veh)	0	0										0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	204	94
Average Queue (ft)	103	27
95th Queue (ft)	189	70
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	53	4	70
Average Queue (ft)	12	0	27
95th Queue (ft)	39	5	61
Link Distance (ft)		778	778
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	65	165	12	255	59	62	123
Average Queue (ft)	22	63	1	88	12	17	51
95th Queue (ft)	50	136	7	195	45	46	100
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		0		3		0	1
Queuing Penalty (veh)		0		0		0	0

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	398	437	250	466	242	193	289	283	212	300	350
Average Queue (ft)	230	232	119	226	105	58	171	177	99	173	216
95th Queue (ft)	356	370	242	389	197	134	264	270	176	273	323
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)			2	29		0	14			0	
Queuing Penalty (veh)			5	47		1	8			0	

Intersection: 8: MLK Jr Blvd (NC 86) & Future Access #1

Movement	WB	NB	SB
Directions Served	R	T	T
Maximum Queue (ft)	55	4	5
Average Queue (ft)	23	0	0
95th Queue (ft)	50	4	5
Link Distance (ft)	424	354	998
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Estes Dr & Future Access #2

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	224	23	104
Average Queue (ft)	42	1	41
95th Queue (ft)	141	11	80
Link Distance (ft)	824	602	332
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 74

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	116	88	63	88	103	51	60
Average Queue (ft)	36	33	12	11	9	4	6
95th Queue (ft)	130	74	42	53	56	26	34
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)	3	0		0			
Queuing Penalty (veh)	2	0		0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	250	536	288	160	325	741	325	174	766	779	275	250
Average Queue (ft)	188	227	53	78	134	340	246	73	498	515	220	236
95th Queue (ft)	281	445	174	137	291	664	375	177	790	805	366	289
Link Distance (ft)		1186				852			980	980		
Upstream Blk Time (%)						0			0	0		
Queuing Penalty (veh)						5			2	2		
Storage Bay Dist (ft)	225		350	300	300		300	150			250	225
Storage Blk Time (%)	14	3	0		0	8	5	0	48	37	0	48
Queuing Penalty (veh)	42	10	0		0	54	26	0	32	93	1	162

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	395	391	192
Average Queue (ft)	300	192	56
95th Queue (ft)	495	387	145
Link Distance (ft)	377	377	
Upstream Blk Time (%)	21	0	
Queuing Penalty (veh)	121	2	
Storage Bay Dist (ft)			175
Storage Blk Time (%)	0	2	0
Queuing Penalty (veh)	1	4	0

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	B14
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR	T
Maximum Queue (ft)	66	112	114	155	108	79	390	423	136	261	273	4
Average Queue (ft)	17	38	35	71	33	9	206	223	42	86	89	0
95th Queue (ft)	48	89	88	134	79	46	362	383	100	210	222	4
Link Distance (ft)		494			614		977	977		2547	2547	1073
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100		375	375		150			225			
Storage Blk Time (%)	0	2					12			1		
Queuing Penalty (veh)	0	0					2			0		

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LT	R	L	L	T	TR	L	T	T
Maximum Queue (ft)	148	195	250	31	21	178	186	308	320	120	394	360
Average Queue (ft)	63	103	98	4	1	87	103	128	131	6	204	182
95th Queue (ft)	147	171	201	19	10	152	165	257	268	59	334	308
Link Distance (ft)		1158	1158		260			1073	1073		1268	1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125		525	525			250		
Storage Blk Time (%)	0	4									4	0
Queuing Penalty (veh)	0	4									0	0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB
Directions Served	R
Maximum Queue (ft)	209
Average Queue (ft)	56
95th Queue (ft)	137
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	39	3	21	102
Average Queue (ft)	8	0	1	35
95th Queue (ft)	30	3	17	76
Link Distance (ft)		573	778	778
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	134	303	27	425	41	117	240
Average Queue (ft)	50	117	1	216	7	34	109
95th Queue (ft)	99	248	18	402	29	91	192
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							1
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		1		14		0	15
Queuing Penalty (veh)		1		0		0	5

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	532	633	175	900	774	174	536	535	324	582	655
Average Queue (ft)	311	357	153	708	460	111	353	350	149	346	438
95th Queue (ft)	504	570	220	1118	1080	206	501	501	294	537	643
Link Distance (ft)		2330		928	928		1689	1689		1161	1161
Upstream Blk Time (%)				31	12						
Queuing Penalty (veh)				0	0						
Storage Bay Dist (ft)	550		150			150			300		
Storage Blk Time (%)	0	1	23	56		9	39		0	10	
Queuing Penalty (veh)	2	4	81	107		33	26		0	12	

Intersection: 8: MLK Jr Blvd (NC 86) & Future Access #1

Movement	WB	NB	SB	SB
Directions Served	R	T	T	T
Maximum Queue (ft)	77	4	343	290
Average Queue (ft)	28	0	109	66
95th Queue (ft)	61	4	382	294
Link Distance (ft)	475	377	977	977
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Estes Dr & Future Access #2

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	539	121	193
Average Queue (ft)	141	15	76
95th Queue (ft)	377	125	160
Link Distance (ft)	852	573	356
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 838

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	32	89	91	67	42	74	96
Average Queue (ft)	3	40	38	4	2	6	11
95th Queue (ft)	19	72	73	29	19	37	53
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)		0	0	0			
Queuing Penalty (veh)		0	1	0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	325	562	356	154	166	272	220	86	248	275	125	325
Average Queue (ft)	202	260	63	70	83	124	96	25	141	145	53	240
95th Queue (ft)	335	456	188	127	140	225	178	65	229	237	100	354
Link Distance (ft)		1186				805	805		980	980		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	300	300			150			250	225
Storage Blk Time (%)	6	16				0			8	0		16
Queuing Penalty (veh)	25	56				0			3	1		80

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	417	416	275
Average Queue (ft)	248	245	106
95th Queue (ft)	408	389	277
Link Distance (ft)	412	412	
Upstream Blk Time (%)	1	0	
Queuing Penalty (veh)	5	3	
Storage Bay Dist (ft)			175
Storage Blk Time (%)	8	17	0
Queuing Penalty (veh)	34	40	0

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	19	65	153	184	113	53	185	203	48	238	230
Average Queue (ft)	1	13	55	94	41	10	57	67	13	70	67
95th Queue (ft)	9	45	123	160	91	36	134	152	39	162	161
Link Distance (ft)		494			614		944	944		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)		0					0			0	
Queuing Penalty (veh)		0					0			0	

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	184	210	294	6	26	29	108	124	170	156	53	428
Average Queue (ft)	80	121	141	0	2	3	38	61	52	50	5	233
95th Queue (ft)	168	186	251	4	16	16	87	108	128	122	40	366
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	1	9										6
Queuing Penalty (veh)	1	10										1

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	400	99
Average Queue (ft)	213	31
95th Queue (ft)	348	76
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	36	66
Average Queue (ft)	9	25
95th Queue (ft)	33	58
Link Distance (ft)		778
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	157	286	53	348	74	103	172
Average Queue (ft)	61	121	2	143	25	32	85
95th Queue (ft)	118	246	32	284	61	78	148
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		1		9		0	8
Queuing Penalty (veh)		1		0		0	3

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	473	442	244	346	145	106	260	243	178	278	254	204
Average Queue (ft)	267	230	67	158	57	42	142	138	79	166	142	83
95th Queue (ft)	417	386	159	280	122	85	223	214	148	250	232	170
Link Distance (ft)		2321		928	928		1689	1689		1161	1161	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	550		150			150			300			350
Storage Blk Time (%)	0	0	0	16			7			0		
Queuing Penalty (veh)	0	0	1	16			4			0		

Intersection: 8: MLK Jr Blvd (NC 86) & Future Access #1

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	54	72	99
Average Queue (ft)	20	5	5
95th Queue (ft)	42	37	41
Link Distance (ft)	510	944	944
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Estes Dr & Future Access #2

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	60	4	91	52
Average Queue (ft)	14	0	35	22
95th Queue (ft)	43	3	72	49
Link Distance (ft)			328	328
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 285

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	50	65	64	42	27	37	50
Average Queue (ft)	16	29	25	3	1	1	3
95th Queue (ft)	44	53	54	20	14	16	24
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	230	285	72	122	140	318	254	139	213	216	106	276
Average Queue (ft)	108	115	15	57	74	144	106	30	114	120	43	133
95th Queue (ft)	193	217	47	104	119	254	192	84	189	194	88	229
Link Distance (ft)		1185				812	812		980	980		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225		350	300	300			150			250	225
Storage Blk Time (%)	0	2				1			3	0		1
Queuing Penalty (veh)	1	3				1			1	0		3

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	186	180	114
Average Queue (ft)	67	78	39
95th Queue (ft)	144	149	95
Link Distance (ft)	354	354	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			175
Storage Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	1	0

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	22	96	60	97	78	62	155	170	54	139	157
Average Queue (ft)	2	22	19	40	26	12	42	46	15	42	44
95th Queue (ft)	14	66	48	80	62	40	107	119	42	109	112
Link Distance (ft)		494			614		998	998		2547	2547
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		150			225		
Storage Blk Time (%)		0					0				
Queuing Penalty (veh)		0					0				

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	87	139	211	20	68	58	109	122	192	192	41	241
Average Queue (ft)	13	52	90	1	19	12	47	67	71	74	7	141
95th Queue (ft)	52	109	177	10	53	41	91	109	157	162	25	220
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	0	1										0
Queuing Penalty (veh)	0	0										0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	216	80
Average Queue (ft)	117	26
95th Queue (ft)	203	65
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	49	77
Average Queue (ft)	9	29
95th Queue (ft)	35	64
Link Distance (ft)		778
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	63	177	9	244	60	60	134
Average Queue (ft)	23	66	0	83	11	18	54
95th Queue (ft)	52	144	5	183	42	48	105
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)				2			2
Queuing Penalty (veh)				0			0

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	425	401	250	478	266	170	275	274	210	229	218	208
Average Queue (ft)	229	224	125	228	108	54	167	176	102	125	99	87
95th Queue (ft)	367	370	251	392	212	118	255	267	180	201	186	172
Link Distance (ft)		2321		928	928		1689	1689		1161	1161	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	550		150			150			300			350
Storage Blk Time (%)			2	29		0	15			0		
Queuing Penalty (veh)			7	46		1	9			0		

Intersection: 8: MLK Jr Blvd (NC 86) & Future Access #1

Movement	WB
Directions Served	R
Maximum Queue (ft)	53
Average Queue (ft)	18
95th Queue (ft)	42
Link Distance (ft)	411
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Estes Dr & Future Access #2

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	59	9	70	56
Average Queue (ft)	18	0	28	20
95th Queue (ft)	49	6	56	49
Link Distance (ft)			320	320
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 74

Intersection: 1: MLK Jr Blvd (NC 86) & Airport Rd

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	80	72	56	58	59	47	62
Average Queue (ft)	28	30	13	8	6	3	5
95th Queue (ft)	65	57	43	36	34	23	32
Link Distance (ft)	882			1381	1381	980	980
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		125	100				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	316	580	271	170	400	677	481	250	657	670	350	325
Average Queue (ft)	213	240	44	84	207	410	246	83	408	423	219	265
95th Queue (ft)	343	480	168	146	453	739	434	227	616	636	437	363
Link Distance (ft)		1186				840	840		980	980		
Upstream Blk Time (%)						2						
Queuing Penalty (veh)						11						
Storage Bay Dist (ft)	225		350	300	300			150			250	225
Storage Blk Time (%)	18	6				35		0	43	32	0	32
Queuing Penalty (veh)	56	19				71		0	29	81	0	108

Intersection: 2: MLK Jr Blvd (NC 86) & Estes Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	417	384	177
Average Queue (ft)	202	155	49
95th Queue (ft)	432	321	123
Link Distance (ft)	378	378	
Upstream Blk Time (%)	6	0	
Queuing Penalty (veh)	38	1	
Storage Bay Dist (ft)			175
Storage Blk Time (%)	1	2	0
Queuing Penalty (veh)	2	4	1

Intersection: 3: MLK Jr Blvd (NC 86) & Municipal Drive/Piney Mountain Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	B14
Directions Served	L	TR	L	L	TR	L	T	TR	L	T	TR	T
Maximum Queue (ft)	68	104	128	156	106	78	388	399	95	271	287	111
Average Queue (ft)	21	37	35	71	39	9	190	205	35	93	96	4
95th Queue (ft)	56	82	92	133	84	47	337	356	82	218	229	109
Link Distance (ft)		494			614		977	977		2547	2547	1073
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100		375	375		150			225			
Storage Blk Time (%)	0	1					10			1		
Queuing Penalty (veh)	0	0					1			0		

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	LT	R	L	L	T	TR	L	T
Maximum Queue (ft)	165	182	218	3	24	20	166	187	264	267	22	359
Average Queue (ft)	62	101	90	0	3	2	89	107	115	117	3	191
95th Queue (ft)	145	166	178	3	17	13	153	170	235	243	15	311
Link Distance (ft)		1158	1158			260			1073	1073		1268
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			125	125		525	525			250	
Storage Blk Time (%)	1	5										3
Queuing Penalty (veh)	1	5										0

Intersection: 4: MLK Jr Blvd (NC 86) & Homestead Rd/Orange United Methodist Church Driveway

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	344	147
Average Queue (ft)	173	54
95th Queue (ft)	293	115
Link Distance (ft)	1268	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		375
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Estes Dr & Sommerset Dr

Movement	EB	EB	WB	B11	SB
Directions Served	L	T	TR	T	LR
Maximum Queue (ft)	42	12	111	48	112
Average Queue (ft)	10	0	25	6	39
95th Queue (ft)	34	9	251	81	90
Link Distance (ft)		574	778	437	778
Upstream Blk Time (%)			1	0	
Queuing Penalty (veh)			12	1	
Storage Bay Dist (ft)	150				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Caswell Rd & Estes Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	156	258	21	467	37	124	218
Average Queue (ft)	57	109	1	236	7	28	111
95th Queue (ft)	112	227	9	439	28	74	191
Link Distance (ft)		890		877	349		220
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	250		125			100	
Storage Blk Time (%)		0		17		0	15
Queuing Penalty (veh)		0		0		0	5

Intersection: 7: Franklin St & Estes Dr

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	474	510	250	650	355	250	575	574	239	295	280	360
Average Queue (ft)	278	296	187	350	142	115	354	355	117	182	159	184
95th Queue (ft)	432	480	305	588	263	265	508	510	211	266	248	311
Link Distance (ft)		2321		928	928		1689	1689		1161	1161	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	550		150			150			300			350
Storage Blk Time (%)	0	0	13	46		2	44		0	0	0	0
Queuing Penalty (veh)	0	2	46	88		7	30		0	0	0	1

Intersection: 8: MLK Jr Blvd (NC 86) & Future Access #1

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	67	157	108
Average Queue (ft)	22	25	11
95th Queue (ft)	53	115	77
Link Distance (ft)	463	977	977
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Estes Dr & Future Access #2

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	R	L	R
Maximum Queue (ft)	64	146	62	81	79
Average Queue (ft)	23	26	3	30	23
95th Queue (ft)	54	206	44	67	67
Link Distance (ft)		574		344	344
Upstream Blk Time (%)		1			
Queuing Penalty (veh)		8			
Storage Bay Dist (ft)	150		150		
Storage Blk Time (%)		2			
Queuing Penalty (veh)		1			

Network Summary

Network wide Queuing Penalty: 632

MOVEMENT SUMMARY

Site: 101 [Estes Dr at Access #2 - AM Peak]

Estes Dr at Access #2
Site Category: Improved (2024)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Estes Drive												
6	T1	627	2.0	0.510	8.2	LOS A	4.0	102.1	0.24	0.09	0.24	33.3
16	R2	37	2.0	0.510	8.2	LOS A	4.0	102.1	0.24	0.09	0.24	32.4
Approach		663	2.0	0.510	8.2	LOS A	4.0	102.1	0.24	0.09	0.24	33.3
North: Future Access #2												
7	L2	59	2.0	0.134	6.6	LOS A	0.5	13.6	0.59	0.56	0.59	32.4
14	R2	36	2.0	0.134	6.6	LOS A	0.5	13.6	0.59	0.56	0.59	31.6
Approach		94	2.0	0.134	6.6	LOS A	0.5	13.6	0.59	0.56	0.59	32.1
West: Estes Drive												
5	L2	38	2.0	0.744	14.3	LOS B	9.7	245.5	0.52	0.25	0.52	30.5
2	T1	909	2.0	0.744	14.3	LOS B	9.7	245.5	0.52	0.25	0.52	30.5
Approach		947	2.0	0.744	14.3	LOS B	9.7	245.5	0.52	0.25	0.52	30.5
All Vehicles		1704	2.0	0.744	11.5	LOS B	9.7	245.5	0.42	0.20	0.42	31.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY



Site: 101 [Estes Dr at Access #2 - Noon Peak]

Estes Dr at Access #2

Site Category: Improved (2024)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Estes Drive												
6	T1	658	2.0	0.550	8.9	LOS A	4.6	117.0	0.31	0.13	0.31	32.9
16	R2	49	2.0	0.550	8.9	LOS A	4.6	117.0	0.31	0.13	0.31	32.1
Approach		707	2.0	0.550	8.9	LOS A	4.6	117.0	0.31	0.13	0.31	32.9
North: Future Access #2												
7	L2	51	2.0	0.120	6.6	LOS A	0.5	12.1	0.60	0.57	0.60	32.4
14	R2	31	2.0	0.120	6.6	LOS A	0.5	12.1	0.60	0.57	0.60	31.6
Approach		82	2.0	0.120	6.6	LOS A	0.5	12.1	0.60	0.57	0.60	32.1
West: Estes Drive												
5	L2	50	2.0	0.492	8.0	LOS A	3.7	94.0	0.28	0.12	0.28	33.2
2	T1	581	2.0	0.492	8.0	LOS A	3.7	94.0	0.28	0.12	0.28	33.2
Approach		631	2.0	0.492	8.0	LOS A	3.7	94.0	0.28	0.12	0.28	33.2
All Vehicles		1420	2.0	0.550	8.4	LOS A	4.6	117.0	0.31	0.15	0.31	33.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY



Site: 101 [Estes Dr at Access #2 - PM Peak]

Estes Dr at Access #2

Site Category: Improved (2024)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Estes Drive												
6	T1	1038	2.0	0.788	15.9	LOS C	11.0	279.2	0.56	0.26	0.56	21.8
16	R2	57	2.0	0.043	3.1	LOS A	0.2	4.3	0.16	0.06	0.16	24.0
Approach		1094	2.0	0.788	15.3	LOS C	11.0	279.2	0.54	0.25	0.54	21.9
North: Future Access #2												
7	L2	41	2.0	0.150	10.0	LOS A	0.5	14.0	0.69	0.69	0.69	22.7
14	R2	28	2.0	0.150	10.0	LOS A	0.5	14.0	0.69	0.69	0.69	21.9
Approach		69	2.0	0.150	10.0	LOS A	0.5	14.0	0.69	0.69	0.69	22.4
West: Estes Drive												
5	L2	60	2.0	0.645	10.9	LOS B	6.7	169.7	0.34	0.14	0.34	23.2
2	T1	776	2.0	0.645	10.9	LOS B	6.7	169.7	0.34	0.14	0.34	22.9
Approach		836	2.0	0.645	10.9	LOS B	6.7	169.7	0.34	0.14	0.34	22.9
All Vehicles		1999	2.0	0.788	13.3	LOS B	11.0	279.2	0.46	0.22	0.46	22.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY



Site: 101 [Estes Dr at Access #2 - AM Peak]

Estes Dr at Access #2

Site Category: Improved (2044)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Estes Drive												
6	T1	692	2.0	0.560	9.0	LOS A	4.9	123.4	0.27	0.10	0.27	32.9
16	R2	37	2.0	0.560	9.0	LOS A	4.9	123.4	0.27	0.10	0.27	32.0
Approach		729	2.0	0.560	9.0	LOS A	4.9	123.4	0.27	0.10	0.27	32.8
North: Future Access #2												
7	L2	59	2.0	0.143	7.1	LOS A	0.6	14.4	0.62	0.61	0.62	32.2
14	R2	36	2.0	0.143	7.1	LOS A	0.6	14.4	0.62	0.61	0.62	31.4
Approach		94	2.0	0.143	7.1	LOS A	0.6	14.4	0.62	0.61	0.62	31.9
West: Estes Drive												
5	L2	38	2.0	0.819	18.2	LOS C	13.6	346.7	0.67	0.32	0.67	28.9
2	T1	1004	2.0	0.819	18.2	LOS C	13.6	346.7	0.67	0.32	0.67	29.0
Approach		1042	2.0	0.819	18.2	LOS C	13.6	346.7	0.67	0.32	0.67	29.0
All Vehicles		1866	2.0	0.819	14.0	LOS B	13.6	346.7	0.51	0.25	0.51	30.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Estes Dr at Access #2 - Noon Peak]

Estes Dr at Access #2
Site Category: Improved (2044)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Estes Drive												
6	T1	727	2.0	0.604	10.0	LOS A	5.6	143.0	0.34	0.15	0.34	32.4
16	R2	49	2.0	0.604	10.0	LOS A	5.6	143.0	0.34	0.15	0.34	31.6
Approach		776	2.0	0.604	10.0	LOS A	5.6	143.0	0.34	0.15	0.34	32.4
North: Future Access #2												
7	L2	51	2.0	0.129	7.2	LOS A	0.5	12.8	0.62	0.62	0.62	32.2
14	R2	31	2.0	0.129	7.2	LOS A	0.5	12.8	0.62	0.62	0.62	31.4
Approach		82	2.0	0.129	7.2	LOS A	0.5	12.8	0.62	0.62	0.62	31.9
West: Estes Drive												
5	L2	50	2.0	0.540	8.7	LOS A	4.4	112.3	0.30	0.13	0.30	32.8
2	T1	642	2.0	0.540	8.7	LOS A	4.4	112.3	0.30	0.13	0.30	32.8
Approach		692	2.0	0.540	8.7	LOS A	4.4	112.3	0.30	0.13	0.30	32.8
All Vehicles		1550	2.0	0.604	9.3	LOS A	5.6	143.0	0.34	0.17	0.34	32.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY



Site: 101 [Estes Dr at Access #2 - PM Peak]

Estes Dr at Access #2

Site Category: Improved (2044)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Estes Drive												
6	T1	1147	2.0	0.871	21.8	LOS C	17.0	431.4	0.78	0.37	0.78	20.6
16	R2	57	2.0	0.043	3.1	LOS A	0.2	4.3	0.16	0.06	0.16	24.0
Approach		1203	2.0	0.871	20.9	LOS C	17.0	431.4	0.75	0.36	0.75	20.8
North: Future Access #2												
7	L2	41	2.0	0.168	11.4	LOS B	0.6	15.4	0.73	0.73	0.73	22.4
14	R2	28	2.0	0.168	11.4	LOS B	0.6	15.4	0.73	0.73	0.73	21.6
Approach		69	2.0	0.168	11.4	LOS B	0.6	15.4	0.73	0.73	0.73	22.1
West: Estes Drive												
5	L2	60	2.0	0.707	12.7	LOS B	8.6	218.8	0.40	0.16	0.40	22.8
2	T1	857	2.0	0.707	12.7	LOS B	8.6	218.8	0.40	0.16	0.40	22.4
Approach		917	2.0	0.707	12.7	LOS B	8.6	218.8	0.40	0.16	0.40	22.5
All Vehicles		2189	2.0	0.871	17.2	LOS C	17.0	431.4	0.60	0.29	0.60	21.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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F

Background Development

LEGEND	
—	Existing Roadway
- -	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

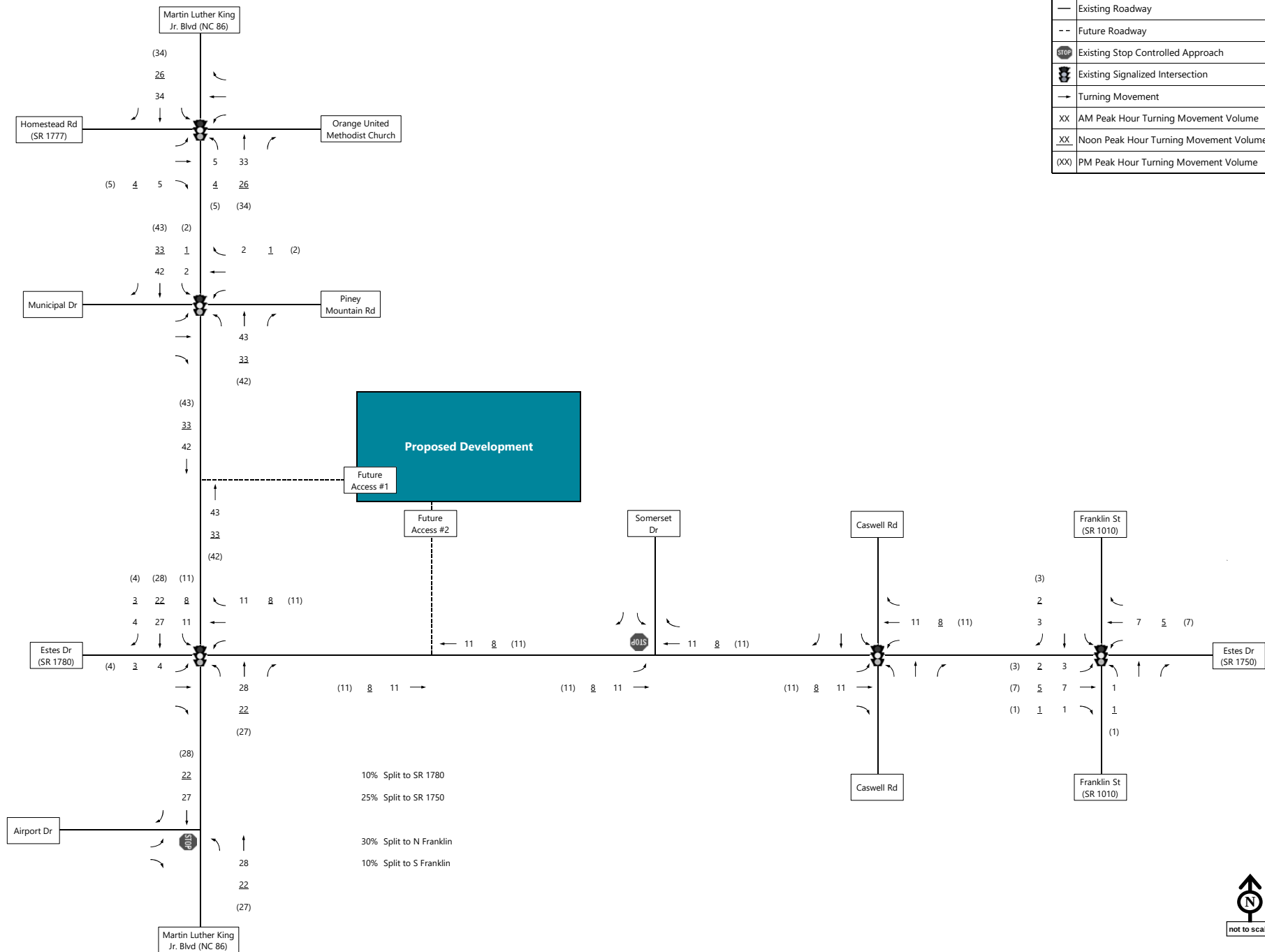
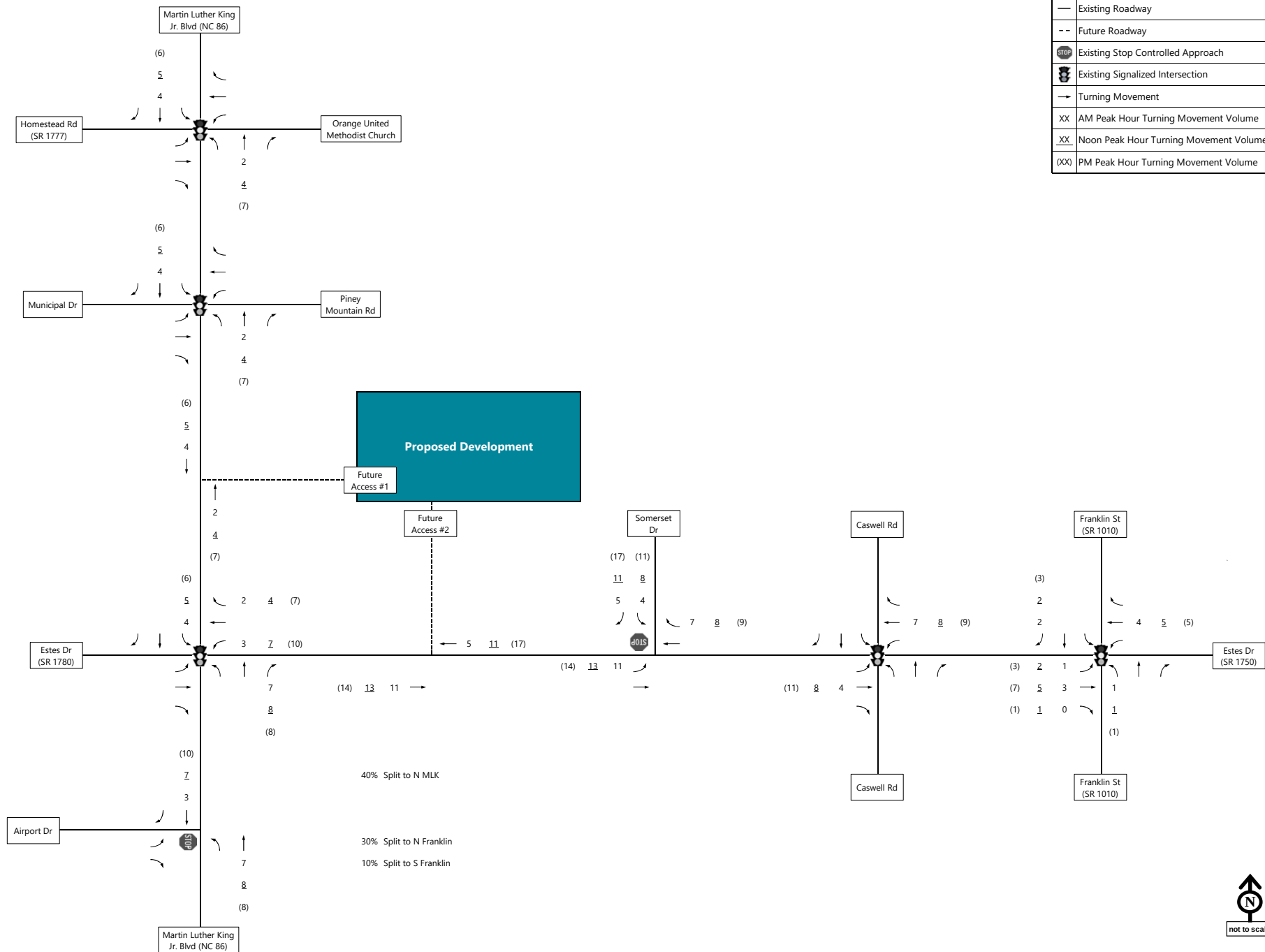
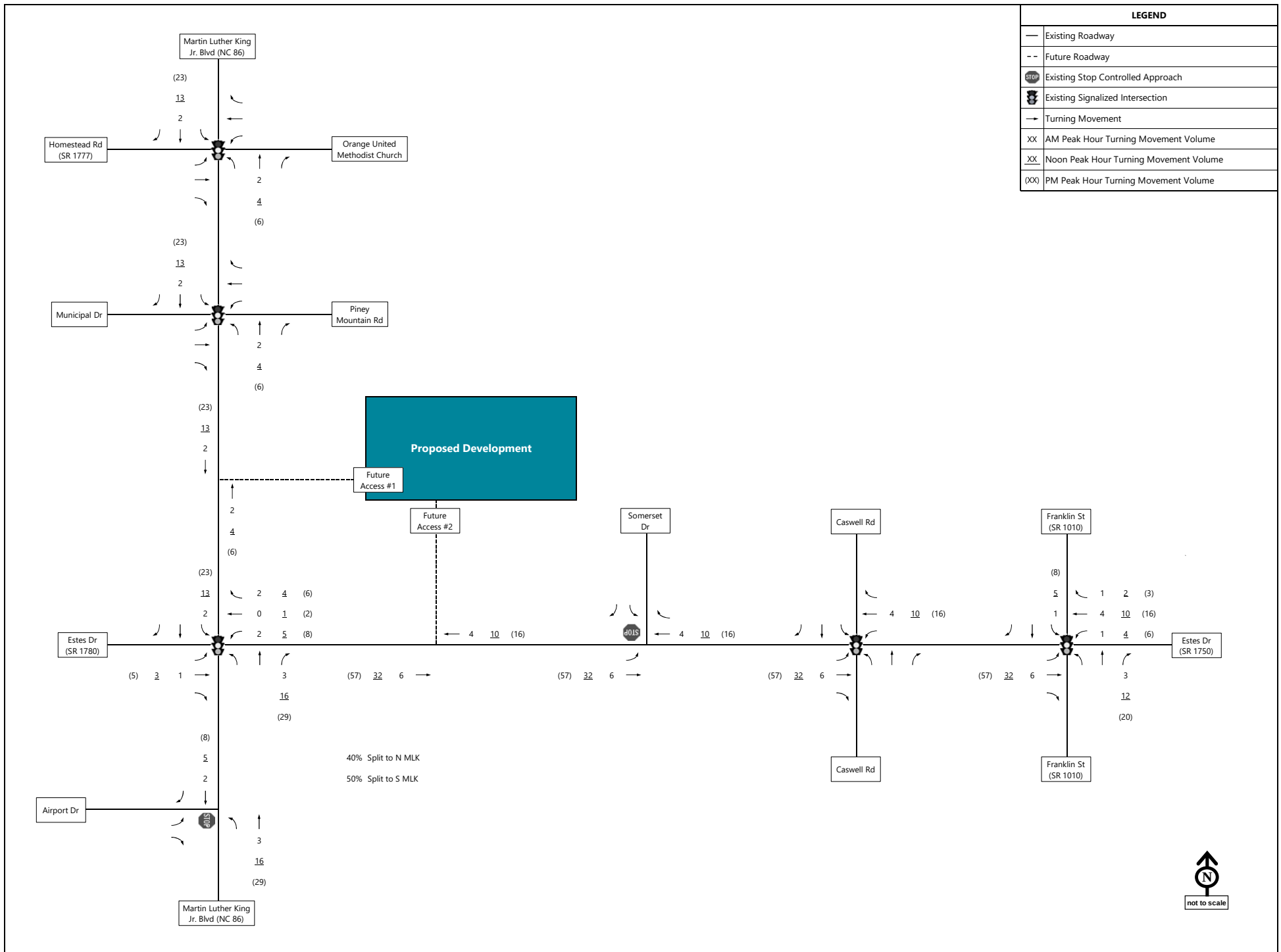


Figure F-1
1200 MLK Redevelopment Site Trips

Aura Chapel Hill Development
Chapel Hill, NC

LEGEND	
	Existing Roadway
	Future Roadway
	Existing Stop Controlled Approach
	Existing Signalized Intersection
	Turning Movement
XX	AM Peak Hour Turning Movement Volume
XX	Noon Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume







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