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# TRAFFIC IMPACT ANALYSIS UNIVERSITY OF NORTH CAROLINA- CHAPEL HILL INNOVATION CENTER

Chapel Hill, North Carolina

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## Executive Summary



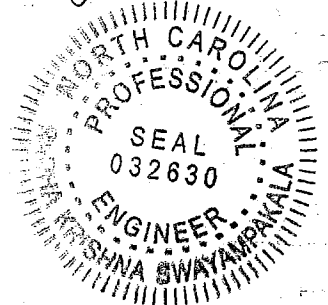
Prepared for:  
**The Town of Chapel Hill, NC**



prepared by:  
**Architects-Engineers-Planners, Inc.**

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## E.0 EXECUTIVE SUMMARY

### E.1 Project Overview

The objective of this study is to analyze the traffic impacts of the proposed University of North Carolina-Chapel Hill (UNC-Chapel Hill) Innovation Center on area roads. The proposed project will replace a vacant building with an 85,000-square-foot office building in the southwest quadrant of the Martin Luther King, Jr. Boulevard-Municipal Drive/Piney Mountain Road intersection. The site is bordered on the north by Municipal Drive, on the east by Martin Luther King, Jr. Boulevard, on the south by Horace Williams Airport, and on the west by Animal Shelter Drive. The site is currently zoned as OI-2. Figures E-1 and E-2 show the proposed site plan and study area zoning respectively.

### E.2 Proposed Project Traffic

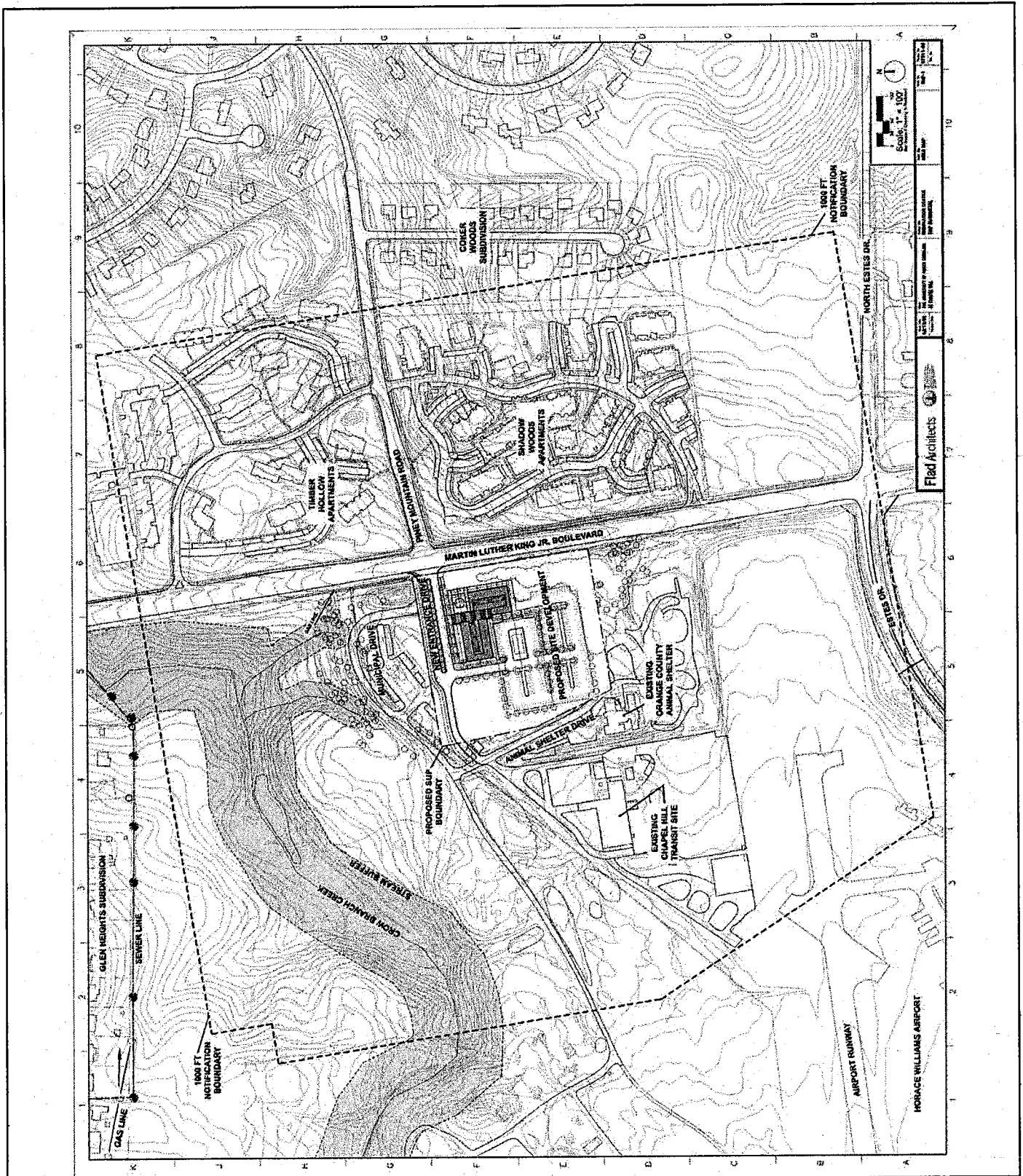
The proposed UNC-Chapel Hill Innovation Center will generate 1,177 daily vehicle trips. Of these, 165 vehicles trip will occur during the AM peak hour, 174 vehicle trips during the midday and PM peak hours.

Table E-1 summarizes the number of trips generated by the proposed development during the AM, midday, and PM peak periods of the day.

**Table E-1**  
**Site Trip Generation Volumes**

Land Use	Size	Traffic Volumes							
		Weekday (veh. per day)		AM Peak Hour (veh. per hour)		Midday Peak Hour (veh. per hour)		PM Peak Hour (veh. per hour)	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
UNC-Chapel Hill Innovation Center	85,000 sq. ft.	589	588	145	20	87	87	30	144





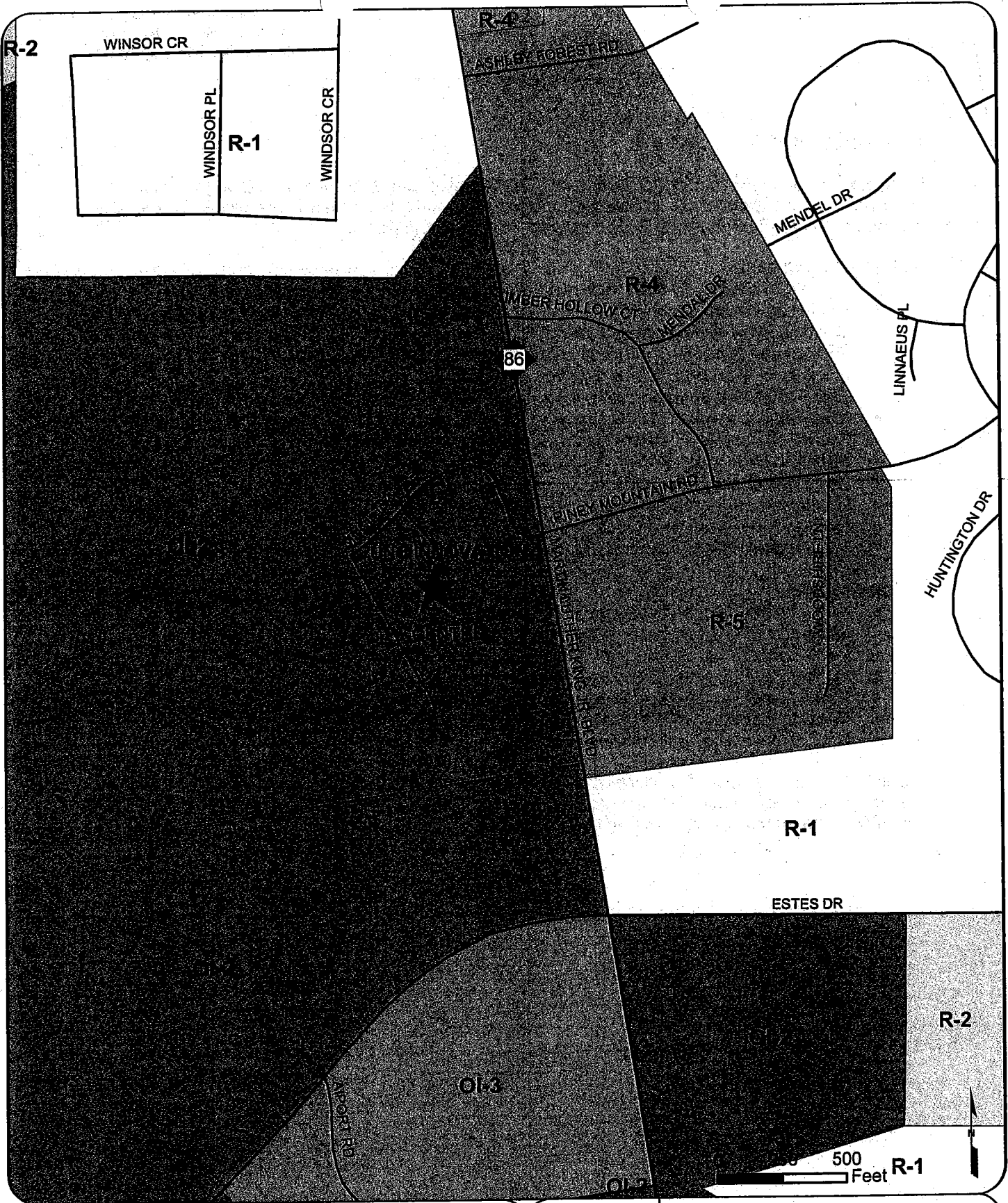
UNC INNOVATION CENTER  
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CHAPEL HILL, NC

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CHARLOTTE, NORTH CAROLINA



PROJECT SITE PLAN

Figure E-1



UNC INNOVATION CENTER  
TRAFFIC IMPACT STUDY



PROJECT LOCATION

FIGURE E-2

### E.3 Project Impacts

To determine the traffic impacts of the proposed site development on nearby roadways, traffic flow conditions were analyzed at the following 13 roadway segments and seven intersections for the 2008 Existing Conditions, 2011 No-Build Conditions, and 2011 Build Conditions:

#### Roadway Segments

- Martin Luther King, Jr. Boulevard, north of Municipal Drive/Piney Mountain Road
- Martin Luther King, Jr. Boulevard, south of Municipal Drive/Piney Mountain Road
- Umstead Drive, west of Martin Luther King, Jr. Boulevard
- Hillsborough Street, east of Martin Luther King, Jr. Boulevard
- Estes Drive, west of Martin Luther King, Jr. Boulevard
- Estes Drive, east of Martin Luther King, Jr. Boulevard
- Municipal Drive, west of Martin Luther King, Jr. Boulevard
- Piney Mountain Road, east of Martin Luther King, Jr. Boulevard
- Northfield Drive, west of Martin Luther King, Jr.
- Homestead Road, west of Martin Luther King, Jr. Boulevard
- Westminster Drive, east of Martin Luther King, Jr. Boulevard
- Weaver Dairy Road, west of Martin Luther King, Jr. Boulevard
- Weaver Dairy Road, east of Martin Luther King, Jr. Boulevard

#### Intersections

- Martin Luther King, Jr. Boulevard at Umstead Drive/Hillsborough Street
- Martin Luther King, Jr. Boulevard at Estes Drive
- Martin Luther King, Jr. Boulevard at Municipal Drive/Piney Mountain Road
- Martin Luther King, Jr. Boulevard at Northfield Drive
- Martin Luther King, Jr. Boulevard at Homestead Road
- Martin Luther King, Jr. Boulevard at Westminster Road
- Martin Luther King, Jr. Boulevard at Weaver Dairy Road

Tables E-2 and E-3 compare the arterial and intersection capacity analysis results for all of the conditions analyzed in this study. Table E-4 summarizes the overall impacts of the proposed project for 2011, one year after the proposed project is built and fully occupied.



Table E-2  
Arterial Capacity Analysis Summary

Facility Type	Roadway Segment	Number of Travel Lanes (both directions)	Peak-Hour Threshold Capacity (veh/hr/direction)	Direction of Travel	2008 Existing Conditions (Volume-to-Capacity Ratio)			2011 No-Build Conditions (Volume-to-Capacity Ratio)			2010 Build Conditions (Volume-to-Capacity Ratio)		
					AM Peak	Mid-day Peak	PM Peak	AM Peak	Mid-day Peak	PM Peak	AM Peak	Mid-day Peak	PM Peak
Major Arterial	Martin Luther King, Jr. Boulevard	4	1,600	Northbound	0.70	0.58	1.11	0.86	0.76	1.33	0.86	0.78	1.34
				Southbound	0.94	0.56	0.82	1.14	0.75	1.07	1.14	0.77	1.08
				Eastbound	1.04	0.74	1.10	1.17	0.91	1.30	1.17	0.93	1.31
Minor Arterial	Estes Drive	2	550	Westbound	0.63	0.92	1.58	0.71	1.10	1.83	0.74	1.13	1.84
				Eastbound	0.93	0.53	0.66	1.11	0.63	0.76	1.13	0.64	0.76
	Homestead Road	2	550	Westbound	0.50	0.43	0.77	0.57	0.52	0.89	0.57	0.53	0.92
				Eastbound	1.21	0.70	0.89	1.35	0.81	0.99	1.35	0.83	1.01
Weaver Dairy Road	2	550	Westbound	0.56	0.80	1.25	0.61	0.90	1.42	0.64	0.93	1.43	

Facility Type	Roadway Segment	Number of Travel Lanes (both directions)	24-Hour Threshold Capacity (veh/hr/direction)	2008 Existing Conditions (Volume-to-Capacity Ratio)		2011 No-Build Conditions (Volume-to-Capacity Ratio)		2010 Build Conditions (Volume-to-Capacity Ratio)	
				AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Collector	Umstead Drive	2	7,000	0.34	0.37	0.37	0.37	0.37	0.37
	Hillsborough Street	2	7,000	0.98	1.36	1.36	1.37	1.37	1.37
	Piney Mountain Road	2	7,000	0.36	0.39	0.39	0.39	0.39	0.39
	Westminster Drive	2	7,000	0.53	0.61	0.61	0.61	0.61	0.61
Local, Non-Residential	Municipal Drive	2	2,500	0.24	0.26	0.26	0.26	0.26	0.26
	Northfield Drive	2	1,500	1.50	1.64	1.64	1.64	1.64	1.64

\* Guidelines for Traffic Impact Analysis, Town of Chapel Hill, October, 2001.





Intersection	Traffic Movement	2007 Existing Conditions (Level of Service)			2010 No-Build Conditions (Level of Service)			2010 Build Conditions (Level of Service)		
		AM Peak	Mid-day Peak	PM Peak	AM Peak	Mid-day Peak	PM Peak	AM Peak	Mid-day Peak	PM Peak
Martin Luther King, Jr. Boulevard at Westminister Drive	Westbound	LTR	E	E	F	E	E	E	E	F
	Northbound	T	A	A	A	A	A	A	A	A
	Southbound	L	A	A	A	A	A	A	A	A
		T	A	A	A	A	A	A	A	A
	Eastbound	L	E	E	F	E	E	F	E	E
		T	E	E	E	E	E	E	E	E
Martin Luther King, Jr. Boulevard at Weaver Dairy Road	Westbound	L	E	D	E	E	B	B	B	B
	Northbound	TR	D	F	F	E	F	E	E	F
		L	E	D	E	E	D	E	D	D
	Southbound	L	E	E	E	E	E	E	E	E
		TR	C	B	C	D	B	C	D	B

**Table E-4**  
**Summary of the Proposed Project's Impacts**

Analyses	Impacts
Mainline Capacity Analysis	The Mainline Capacity Analysis indicate that the traffic demand on six of the ten roadways analyzed in this study would exceed the roadway capacity limits in at least one direction during at least one peak hour of the day irrespective of the proposed development.
Site Access	Municipal Drive, the primary road providing access to/egress from the proposed development, would be sufficient to accommodate the estimated site traffic for the proposed development.
New Signal Location	The seven intersections analyzed in this study are presently signalized. No new signal locations have been identified.
Traffic Signal Phasing	The seven intersections analyzed for this study have multi-phase controllers that can accommodate variations in traffic flow. Traffic demand at five of the seven signalized intersections would exceed the intersection capacity limits under the 2011 No-Build and Build Conditions.
Crash Analysis	Crash data was obtained from the North Carolina Department of Transportation (NCDOT) for a 36-month period for locations most likely to be impacted by the proposed development. This crash data indicated that the following signalized intersections along Martin Luther King, Jr. Boulevard have a high number of rear-end crashes, possibly indicating congestion problems: Estes Drive, Homestead Road, and Weaver Dairy Road.
Traffic Signal Progression	The signalized intersections in the study area were analyzed as isolated intersections; therefore, no Progression Analysis was conducted as part of this study.
Peak Hour Intersection Capacity	The peak hour intersection capacity analyses indicate that the proposed development has minimal impact on the traffic flow at the study intersections. Roadway improvements are needed at the intersections of Martin Luther King, Jr. Boulevard/Estes Drive; and Martin Luther King, Jr. Boulevard/Weaver Dairy Road irrespective of the proposed development.
Turn Lane Storage Requirements	The traffic generated by the proposed development will use Municipal Drive as the primary entrance into the proposed project. Traffic demand at Martin Luther King, Jr. Boulevard and Municipal Drive flows within the acceptable limits of capacity under the 2008 Existing and 2011 No-Build and Build Conditions. No additional turn lanes are needed at this intersection to accommodate the proposed development's traffic.
Intersection Sight Distance	At the intersection of Martin Luther King, Jr. Boulevard-Municipal Drive, sight distance from Municipal Drive is adequate to allow the driver of the first vehicle stopped on the eastbound approach to be seen by the driver of the first vehicle stopped at each of the other approaches. Additionally, northbound and southbound Martin Luther King, Jr. Boulevard left-turning vehicles have sufficient sight distance to select gaps in oncoming traffic in order to make the left turn maneuvers safely. No improvements to the intersection sight distance are needed.
Appropriateness of Acceleration/Deceleration Lanes	The speed limit on Municipal Drive, the roadway that would provide access to/egress from the proposed development, is 25 mile per hour, indicating that there is no need for acceleration/deceleration lanes at site driveway.
Pedestrian and Bicycle Facilities	Sidewalks are present along Martin Luther King, Jr. Boulevard from Umstead Drive/Hillsborough Street to Weaver Dairy Road. Martin Luther King, Jr. Boulevard is also designated for bicycle use. No sidewalks or bicycle lanes are present on Municipal Drive. The proposed development does not add any sidewalk or bicycle lanes.
Public Transportation Facilities	In the vicinity of the proposed development, multiple bus routes are present. No additional bus routes/stops will be added as part of this project.



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#### **E.4 Mitigation Measures/Recommendations**

Roadway improvements are divided into four categories: improvements already planned by the Town or NCDOT; those required regardless of development at the proposed site; improvements proposed as part of the site development; and any additional improvements required as a result of site development.

##### **Planned Improvements**

There are no planned improvements to study area roads.

##### **Background Committed Improvements**

No other roadway improvements that directly impact this analysis are committed by other development projects in the area.

##### **Applicant Committed Improvements**

There are no applicant committed improvements to the study area roads.

##### **Recommended Improvements**

There are no recommended roadway improvements to the study intersections.

