



CITY OF DURHAM | NORTH CAROLINA

Date: December 8, 2015

To: Amy Wolff, Durham City County Planning Department
From: Bill Judge PE, City of Durham Department of Transportation
Subject: NC 55 at T.W. Alexander Drive Apartments (Z1500032) Traffic Impact Analysis

The Unified Development Ordinance (UDO) requires that a Traffic Impact Analysis (TIA) be prepared for proposed developments estimated to generate 150 or more peak-hour vehicle trips. The proposed NC 55 at T.W. Alexander Drive development proposes 300 apartments. The development is expected to generate 1,942 daily trips with 151 a.m. peak-hour trips (30 entering and 121 exiting) and 183 p.m. peak-hour trips (119 entering and 64 exiting). The proposed development is located on the east side of NC 55, north of T.W. Alexander Drive. Access to the site will be provided via proposed driveway connections to NC 55 and T.W. Alexander Drive. The expected completion year is 2017, and the TIA analysis year is 2018. The TIA was prepared by A. Morton Thomas and Associates in August 2015.

Study Area

The study area includes the following intersections:

- NC 55 and T.W. Alexander Drive;
- T.W. Alexander Drive and Site Driveway #1; and
- NC 55 and Site Driveway #2.

Trip Generation

Trip generation numbers are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition*, 2012. The 300 apartments are expected to generate 1,942 daily trips with 151 a.m. peak-hour trips (30 entering and 121 exiting) and 183 p.m. peak-hour trips (119 entering and 64 exiting).

Traffic Data Collection

The peak-hour intersection turning movement counts were taken from 7-9 a.m. and 4-6 p.m. in July 2015.

Trip Distribution and Assignment

The assignment of site traffic on the study area roadway network was based on the following trip distribution percentages:

- To/From the North via NC 55: 45% of site trips;
- To/From the South via NC 55: 35% of site trips; and
- To/From the East via T.W. Alexander Drive: 20% of site trips.

Approved Developments and Background Growth

There are no approved projects in the vicinity. A uniform annual compounded growth rate of 3% was utilized to determine the background traffic projections.

TIP Roadway Improvements

There are no significant scheduled transportation improvement projects in the study area vicinity.

Capacity Analysis

Capacity analyses were performed using the a.m. and p.m. peak-hour for the following scenarios:

- Existing (2015) condition;
- No-Build (2028) condition (2015 existing + background growth);
- Build (2018) condition (2015 existing + background growth + site traffic);
- Build (2018) with improvements condition (2015 existing + background growth + site traffic + improvements).

This development is located within the Suburban Tier where the adopted LOS standard is LOS D. The following table summarizes the average delay for the various Levels of Service (LOS) for unsignalized and signalized intersections:

	Signalized Intersections	Unsignalized Intersections
Level of Service	Average Vehicle Delay (Seconds)	Average Vehicle Delay (Seconds)
A	0-10	0-10
B	10-20	10-15
C	20-35	15-25
D	35-55	25-35
E	55-80	35-50
F	>80	>50

NC 55 and T.W. Alexander Drive

The following table summarizes the Levels of Service at this signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2015)	A	C
No-Build (2018)	A	C
Build (2018)	A	C

The intersection currently operates at a LOS A during the a.m. peak-hour and a LOS C during the p.m. peak-hour. With the existing lane configuration and additional background and site traffic, the intersection will continue to operate at an acceptable LOS C or better for both the a.m. and p.m. peak-hour for the Build (2018) condition. No roadway improvements are required to address the site traffic impacts.

T.W. Alexander Drive and Site Driveway #1

The following table summarizes the Levels of Service at this unsignalized intersection:

Scenario	a.m. LOS	p.m. LOS
Build (2018) with Improvements	B*	C*

* Unsignalized operation, with LOS reported for the worst approach

The TIA recommended the following improvements to accommodate site traffic:

- Construct Site Driveway #1 to provide one ingress lane and one egress lane; and
- Construct an exclusive eastbound left-turn lane with a minimum 75 feet of storage and appropriate taper on T.W. Alexander Drive at Site Driveway #1.

With the improvements listed above, the intersection will operate at an acceptable LOS C or better for both the a.m. and p.m. peak-hour.

NC 55 and Site Driveway #2

The following table summarizes the Levels of Service at this proposed unsignalized intersection:

Scenario	a.m. LOS	p.m. LOS
Build (2018)	C*	C*

* Unsignalized operation, with LOS reported for the worst approach

The TIA recommended the following improvement to accommodate site traffic:

- Construct Site Driveway #2 to provide one ingress lane and one egress lane; and
- Construct an exclusive northbound right-turn lane with a minimum 100 feet of storage and appropriate taper on NC 55 at Site Driveway #2.

With the improvements listed above, the intersection will operate at an acceptable LOS C for both the a.m. and p.m. peak-hour.

Summary of improvements required for this development:

T.W. Alexander Drive and Site Driveway #1

1. Construct an exclusive eastbound left-turn lane with adequate storage and appropriate taper on T.W. Alexander Drive at Site Driveway #1.
2. Construct Site Driveway #1 to provide one ingress lane and one egress lane.

NC 55 and Site Driveway #2

1. Construct an exclusive northbound right-turn lane with adequate storage and appropriate taper on NC 55 at Site Driveway #2.
2. Construct Site Driveway #2 to provide one ingress lane and one egress lane.