



**Date:** July 2, 2013

**To:** Amy Wolff, Durham City County Planning Department  
**From:** Bill Judge PE, City of Durham Department of Transportation  
**Subject:** Hope Valley Farms Pod BB Revision (Z1300012) 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 Hope Valley Farms Pod BB development includes a convenience store with 16 fueling positions, a 4,500 SF fast-food restaurant with a drive-thru, and a bank with three drive-up lanes. The development is expected to generate 497 a.m. peak-hour trips (254 entering and 243 exiting) and 552 p.m. peak-hour trips (278 entering and 274 exiting). The proposed development is located on the south side of Martin Luther King, Jr. Parkway, west of S. Roxboro Street.

The site will be accessed via two driveway connections to Martin Luther King, Jr. Parkway. The western site driveway (Site Access #1) is a proposed full-access connection to be aligned with the existing full-access shopping center driveway to the north. The eastern site driveway (Site Access #2) is proposed as a right-in/right-out connection. The expected completion year is 2014, and the TIA analysis year is 2015. The TIA was prepared by Kimley-Horn and Associates, Inc. in April 2013.

#### **Study Area**

The study area includes the following intersections:

- Martin Luther King, Jr. Parkway and S. Roxboro Street;
- Martin Luther King, Jr. Parkway and Site Access #1 / Valley Creek Center Driveway; and
- Martin Luther King, Jr. Parkway and Site Access #2.

#### **Trip Generation**

Trip generation numbers are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9<sup>th</sup> Edition, 2012*. The proposed use will generate 497 a.m. peak-hour and 552 p.m. peak-hour trips. The a.m. and p.m. peak-hour trips were adjusted utilizing published ITE rates to account for pass-by trips. The final adjusted external trips for the proposed site resulted in 230 a.m. peak-hour (119 entering and 111 exiting) and 230 p.m. peak-hour trips (116 entering and 114 exiting).

#### **Traffic Data Collection**

The peak-hour intersection turning movement counts were taken from 7-9 a.m. and 4-6 p.m. in March 2013.

#### **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 West via Martin Luther King, Jr. Parkway: 40% of site trips;
- To/From the East via Martin Luther King, Jr. Parkway: 40% of site trips
- To/From the South via S. Roxboro Street: 15% of site trips;
- To/From the North via Valley Creek Center Driveway: 3% of site trips; and
- To/From the North via S. Roxboro Street: 2% of site trips.

**Approved Developments and Background Growth**

Approved development traffic is traffic generated by specific approved, but not yet constructed, projects within the vicinity of the subject project. 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 (2013) conditions;
- No-Build (2015) conditions (2013 Existing + Background growth traffic); and
- Build (2015) conditions (2013 Existing + Background growth traffic + Site traffic).

The proposed development and project study area are 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:

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

Martin Luther King, Jr. Parkway and S. Roxboro Street

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

Scenario	a.m. LOS	p.m. LOS
Existing (2013)	C	C
No-Build (2015)	C	C
Build (2015)	C	C

The intersection currently operates at a LOS C in both the a.m. and p.m. peak hours. With the additional site traffic, the delays will increase slightly, but the intersection will continue to operate at an acceptable LOS C for both peak hours. No roadway improvements are required.

Martin Luther King, Jr. Parkway and Site Access #1 (full-access) / Valley Creek Center Driveway

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

Scenario	a.m. LOS	p.m. LOS
Existing (2013)	B*	B*
No-Build (2015)	B*	B*
Build (2015)	F*	F*

\* Unsignalized operation, with LOS reported for the worst approach

The intersection currently operates at a LOS B in both the a.m. and p.m. peak hours. With the additional site traffic and the following TIA recommended improvement, the intersection will operate at a LOS F in both the a.m. and p.m. peak hours:

- Construct Site Access #1 with one ingress and two egress lanes (an exclusive northbound left-turn lane and a shared northbound through/right-turn lane).

To address potential operation and safety concerns with the excessive side street queuing and delays, the following additional improvements are required:

- Construct an eastbound right-turn lane with adequate storage and taper on Martin Luther King, Jr. Parkway at Site Access #1; and
- Install a traffic signal with steel poles, mast arms, pedestrian signals, and interconnect cable (subject to a MUTCD traffic signal warrants analysis prepared by the applicant and approved by City Transportation at the site plan stage).

Martin Luther King, Jr. Parkway and Site Access #2 (right-in/right-out)

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

Scenario	a.m. LOS	p.m. LOS
Build (2015)	B*	C*

\* Unsignalized operation, with LOS reported for the worst approach

The intersection is expected to operate at an acceptable LOS C or better for the Build (2015) condition. To address potential operation and safety concerns with site traffic on Martin Luther King, Jr. Parkway, the following additional improvement is also required:.

- Construct an eastbound right-turn lane with adequate storage and taper on Martin Luther King, Jr. Parkway at Site Access #2.

### **Summary of TIA Required Improvements**

#### Martin Luther King, Jr. Parkway and Site Access #1 / Valley Creek Site Drive

1. Construct Site Access #1 with one ingress lane and two egress lanes (an exclusive northbound left-turn lane and a shared through/right-turn lane).
2. Construct an eastbound right-turn lane on Martin Luther King, Jr. Parkway with adequate storage and taper.
3. Install a traffic signal with steel poles, mast arms, pedestrian signals, and interconnect cable (subject to a MUTCD traffic signal warrants analysis prepared by the applicant and approved by City Transportation at the site plan stage).

#### Martin Luther King Jr. Parkway and Site Access #2

1. Construct Site Access #2 as a right-in/right-out connection to Martin Luther King, Jr. Parkway with one ingress and one egress lane.
2. Construct an eastbound right-turn lane on Martin Luther King, Jr. Parkway with adequate storage and taper.