



CITY OF DURHAM | NORTH CAROLINA

Date: April 17, 2014

To: Amy Wolff, Durham City County Planning Department
From: Bill Judge PE, City of Durham Department of Transportation
Subject: Hendrick Southpoint Phase II (Z1400002) Traffic Impact Analysis

The Unified Development Ordinance (UDO) requires a Traffic Impact Analysis (TIA) for proposed developments estimated to generate 150 or more peak-hour vehicle trips. The proposed development, Hendrick Southpoint Phase II, includes 150,000 square-foot floor area for multiple proposed auto dealers. The proposed development is expected to generate 288 a.m. peak-hour trips (216 entering and 72 exiting) and 393 p.m. peak-hour trips (158 entering and 235 exiting). The proposed development is located on the west side of Fayetteville Road, south of Renaissance Parkway.

The TIA analyzed two proposed external access points. Site Drive 1 will utilize the existing public street connection of Kentington Drive at Fayetteville Road. Site Drive 2 will utilize the existing street connection of Rolando Drive at Renaissance Parkway. The expected completion year is 2016, and the TIA analysis year is 2017. The TIA study was prepared for the proposed development by Ramey Kemp & Associates, Inc. in January 2014.

Study Area

The study area includes the following intersections:

- Fayetteville Road and Herndon Road;
- Fayetteville Road and Southpoint Mall Driveway;
- Fayetteville Road and Renaissance Parkway;
- Fayetteville Road and Massey Chapel Road (northern intersection);
- Fayetteville Road and Massey Chapel Road (southern intersection);
- Renaissance Parkway and Western Southpoint Mall Driveway;
- Fayetteville Road and Kentington Drive (Site Access #1); and
- Renaissance Parkway and Rolando Drive (Site Access #2) / Eastern Southpoint Mall Driveway.

Trip Generation

Trip generation numbers are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition, 2012*. The proposed development is expected to generate 288 a.m. peak-hour trips (216 entering and 72 exiting) and 393 p.m. peak-hour trips (158 entering and 235 exiting).

Traffic Data Collection

The peak-hour intersection turning movement counts were taken from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:30 p.m. in January 2014.

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 Fayetteville Road: 45% of site trips;
- To/From the South via Fayetteville Road: 10% of site trips;
- To/From the East via Massey Chapel Road: 15% of site trips;
- To/From to West via Massey Chapel Road: 5% of site trips;
- To/From the East via Herndon Road: 5% of site trips;
- To/From the West via Renaissance Parkway: 13% of site trips;
- To/From the East Via Renaissance Parkway: 2% of site trips; and
- To/From the Southpoint Mall via Renaissance Parkway: 5% of site trips.

Approved Developments and Background Growth

A uniform annual compounded growth rate of 3% was utilized to determine the background traffic projections. In addition to the growth rate, the TIA used traffic volume projections from the following approved developments:

- NC 751 South: This development is located on the west side of NC 751 near the NC 751/Fayetteville Road intersection, north of the Chatham County line. The development includes: 1,300 residential units (700 apartments, 556 townhomes, and 44 single-family homes); 320,000 square feet of office space; 280,000 square feet of retail space; and 150,000 square feet of civic space that includes a 600-student public elementary school and a YMCA. The TIA assumed 10% of this development would be constructed by the 2017 build-out year;
- Westpoint at 751 Development: This development is located on the west side of NC 751 across from Renaissance Parkway. The development includes: 70,000 square feet of office space; 35,000 square feet of medical/dental office; a 150 room hotel; a 7,500 square foot high turnover restaurant; a 7,500 square foot quality restaurant; and a 20,000 square foot supermarket. The TIA assumed 100% of this development would be constructed by the 2017 build-out year;
- The Hills at Southpoint: 200 additional single-family homes located on the east side of Fayetteville Road approximately 1.5 miles south of I-40. The TIA assumed 100% of this development would be constructed by the 2017 build-out year; and
- Hendrick Southpoint Phase 1: 180,000 square feet of new car sales on the west side of Fayetteville Road and south side of Renaissance Parkway adjacent to the proposed development. The TIA assumed 100% of this development would be constructed by the 2017 build-out year.

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 (2014) conditions;
- No-Build (2017) conditions (2014 Existing + Background growth traffic);
- Build (2017) conditions (2014 Existing + Background growth traffic + Site traffic); and
- Build (2017) with Improvements conditions (2017 Build + Improvements).

This 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:

	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

Fayetteville Road and Herndon Road

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	B	B
No-Build (2017)	B	B
Build (2017)	B	B

The intersection currently operates at a LOS B during both the a.m. and p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS B for both peak hours. No roadway improvements are required to address the site traffic impacts.

Fayetteville Road and Southpoint Mall Driveway

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	A	B
No-Build (2017)	A	B
Build (2017)	A	B

The intersection currently operates at a LOS A during the a.m. peak-hour and a LOS B during the p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS B or better for both peak hours. No roadway improvements are required to address the site traffic impacts.

Fayetteville Road and Renaissance Parkway

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	C	C
No-Build (2017)	C	C
Build (2017) with Improvements	C	C

The intersection currently operates at a LOS C during both the a.m. and p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS C for both peak hours. Although the intersection will operate at an acceptable LOS, to address potential vehicle queuing problems, the TIA recommended the following required improvement:

- Extend the inside eastbound left-turn lane on Renaissance Parkway at Fayetteville Road to provide a minimum of 400 feet of storage plus appropriate tapers.

Fayetteville Road and Massey Chapel Road (northern intersection)

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	B*	C*
No-Build (2017)	B*	C*
Build (2017) with Improvements	B*	C*

* Unsignalized operation, with LOS reported for the worst (WB) approach

The existing unsignalized intersection currently operates at a LOS B in the a.m. peak-hour and a LOS C in the p.m. peak-hour. The intersection is expected to remain to a LOS B in the a.m. peak-hour and a LOS C in the p.m. peak-hour for the No-Build (2017) condition with the following improvements required of NC 751 South Development:

- Construct a westbound right-turn lane on Massey Chapel Road with a minimum of 200 feet of storage plus appropriate tapers; and
- Construct a northbound right-turn lane on Fayetteville Road with a minimum of 150 feet of storage plus appropriate tapers.

With the proposed roadway improvements and the additional site traffic for the Build (2017) condition, the intersection will remain at an acceptable LOS C or better for both peak hours. No additional roadway improvements are required to address the site traffic impacts.

Fayetteville Road and Massey Chapel Road (southern intersection)

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	C*	C*
No-Build (2017)	C*	C*
Build (2017) with Improvements	D*	C*

* Unsignalized operation, with LOS reported for the worst (EB) approach

The existing unsignalized intersection currently operates at a LOS C during both the a.m. and p.m. peak-hour. The intersection is expected to remain to a LOS C for both the a.m. and p.m. peak-hour for the No-Build (2017) condition with the following improvement required of NC 751 South Development:

- Construct an eastbound right-turn lane on Massey Chapel Road with a minimum of 200 feet of storage plus appropriate tapers.

With the proposed roadway improvement and the additional site traffic for the Build (2017) condition, the intersection will remain at an acceptable LOS D or better for both peak hours. No additional roadway improvements are required to address the site traffic impacts.

Renaissance Parkway and Western Southpoint Mall Driveway

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	A	B
No-Build (2017)	A	B
Build (2017)	A	B

The intersection currently operates at a LOS A during the a.m. peak-hour and a LOS B during the p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS B or better for both peak hours. No roadway improvements are required to address the site traffic impacts.

Fayetteville Road and Kentington Drive (Site Access #1)

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	B*	B*
No-Build (2017)	A*	A*
Build (2017) with Improvements	A*	A*

* Unsignalized operation, with LOS reported for the worst (EB) approach

The existing unsignalized intersection currently operates at a LOS B during both the a.m. and p.m. peak-hour. The intersection is expected to operate at a LOS A for both the a.m. and p.m. peak-hour

for the No-Build (2017) condition with the following improvements required of Hendrick Southpoint Phase I development:

- Construct a second southbound through lane on Fayetteville Road;
- Construct a median on Fayetteville Road to NCDOT Standards to limit access to/from Kentington Drive to left-in, right-in, and right-out only;
- Construct a northbound left-turn lane on Fayetteville Road with 100 feet of minimum storage plus appropriate tapers; and
- Construct a southbound right-turn lane on Fayetteville Road with 100 feet of minimum storage plus appropriate tapers.

With the proposed roadway improvements and the additional site traffic for the Build (2017) condition, the intersection will remain at an acceptable LOS A for both peak hours. No additional roadway improvements are required to address the site traffic impacts.

Renaissance Parkway and Rolando Drive (Site Access #2) / Eastern Southpoint Mall Driveway

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

Scenario	a.m. LOS	p.m. LOS
Existing (2014)	A*	C*
No-Build (2017)	B	C
Build (2017) with Improvements	C	C

* Unsignalized operation, with LOS reported for the worst (SB) approach

The existing unsignalized intersection currently operates at a LOS A in the a.m. peak-hour and a LOS C in the p.m. peak-hour. The intersection is expected to operate at a LOS C or better for the No-Build (2017) condition with the following improvements required of Hendrick Southpoint Phase I development:

- Construct an additional northbound lane on Rolando Drive (Site Access #2) to provide an exclusive northbound right-turn lane with a minimum of 200 feet of storage plus appropriate tapers and a shared through-left lane;
- Restripe the Eastern Southpoint Mall Driveway to provide an exclusive southbound right-turn lane and a shared through-left lane; and
- Install a traffic signal with steel poles and mast arms (subject to MUTCD warrants and approval by the City of Durham).

With the proposed roadway improvements and the additional site traffic for the Build (2017) condition, the intersection will remain at an acceptable LOS C for both peak hours. No additional roadway improvements are required to address the site traffic impacts.

Summary of Improvements (required only of Hendrick Southpoint Phase II):

Fayetteville Road and Renaissance Parkway

1. Extend the inside eastbound left-turn lane on Renaissance Parkway at Fayetteville Road to provide adequate storage and appropriate tapers.

Summary of Improvements (required of both Hendrick Southpoint Phase I and Hendrick Southpoint Phase II):

Fayetteville Road

1. Widen the west side of Fayetteville Road to provide a one-half of the future four-lane divided roadway (with curb, gutter, and bicycle lanes) from the existing four-lane section near Renaissance Parkway to the southern property line of the site.
2. Construct a monolithic concrete island per NCDOT Standards on Fayetteville Road from north of Kentington Drive to James Ross Road. The island must be designed to prevent left-turns from Kentington Drive onto northbound Fayetteville Road.
3. Construct a southbound left-turn lane with adequate storage and appropriate tapers on Fayetteville Road at James Ross Road. Provide adequate widening on northbound Fayetteville Road to accommodate southbound u-turn movements at James Ross Road.

Fayetteville Road and Kentington Drive (Site Access #1)

1. Construct a second southbound through lane on Fayetteville Road.
2. Construct a northbound left-turn lane on Fayetteville Road with adequate storage and appropriate tapers.
3. Construct a southbound right-turn lane on Fayetteville Road with adequate storage and appropriate tapers.

Renaissance Parkway and Rolando Drive (Site Access #2) / Eastern Southpoint Mall Driveway

1. Construct an additional northbound lane on Rolando Drive (Site Access #2) to provide an exclusive northbound right-turn lane with adequate storage and appropriate tapers and a shared through-left lane.
2. Restripe the Eastern Southpoint Mall Driveway to provide an exclusive southbound right-turn lane and a shared through-left lane.
3. Install a traffic signal with steel poles and mast arms (subject to MUTCD warrants and approval by the City of Durham).

Summary of Improvements Committed by Others (which may also be required of this development)

Fayetteville Road and Massey Chapel Road (northern intersection)

1. Construct a westbound right-turn lane on Massey Chapel Road with adequate storage and appropriate tapers.
2. Construct a northbound right-turn lane on Fayetteville Road with adequate storage and appropriate tapers.

Fayetteville Road and Massey Chapel Road (southern intersection)

1. Construct an eastbound right-turn lane on Massey Chapel Road with adequate storage and appropriate tapers.