



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

January 28, 2010

To: Mr. Carl A. Hultgren, P. E.
Kimley-Horn and Associates, Inc.
102 City Hall Plaza Suite 201
Durham, NC 27701

Subject: Arrington Mixed Use Development Traffic Impact Analysis

Synopsis

The proposed Arrington Mixed Use Development TIA prepared for Lichtin Corporation is located on the eastside of SR 1973 (Page Road) south of SR 1972 (Comstock Road) in Durham County, North Carolina. The Arrington Mixed Use Development proposes to consist of the following uses:

- 355 Additional Units of Multi-Family Homes
- 325 Units of Continuing Care Retirement Community
- 520,000 SF of General Office Building
- 125,000 SF of Medical Office Building
- 15,000 SF of Pharmacy with Driveway Window
- 3 lane Drive-In Bank
- 7,500 SF High turnover Restaurant
- 7,500 SF High turnover Restaurant
- 4,000 SF Fast Food Restaurant with Drive through Window
- 12 Position Fueling Station with Convenience Store

The development has an anticipated build-out year 2014 with an analysis year of 2015. The proposed development is projected to generate 20,294 daily trips with 1,781 A.M. peak hour site trips and 1,997 P.M. peak hour site trips.

Scope

The TIA analyzed the following nine (9) intersections:

- SR 1973 (Page Road) and Slater Road
- SR 1973 (Page Road) and I-40 EB Ramp/ Emperor Blvd
- SR 1973 (Page Road) and I-40 WB Ramp
- SR 1973 (Page Road) and Full Movement Driveway(Westleigh Drive)/ Office Park Drive
- SR 1973 (Page Road) and Arrington Park Drive/ Office Park Drive
- SR 1973 (Page Road) and Right in/Right out Driveway
- SR 1973 (Page Road) and Comstock Road
- SR 1973 (Page Road) and Chin Page Road
- SR 1973 (Page Road) and Pleasant Grove Church

Note: SR 1973 (Page Road) and Old Page Road was not analyzed

Approved Surrounding Developments- as referenced in the TIA

1. Four Seasons at Renaissance

This development is located in the southwest quadrant of the intersection of SR 1973 (Page Road), and is adjacent to the Page Road Business Park property to the north. At full build-out in 2013, the development is expected to consist of 200,000 square feet of light industrial, 107,500 square feet of office space, 77,000 square feet of specialty retail, 5,000 square feet of high turn over restaurant, 5,000 square feet of daycare, 205 single-family homes, and 214 townhomes.

2. Cumberland Park Neighborhood

This development is located on the west side of SR 1973 (Page Road) across from the Arrington development. At full build-out, this development will consist of 272 townhomes, and the first 143 units have been approved. A TIA analysis was not required for this development.

3. Chin Page – Page Road Assemblage (ALMO)

A mixed-use development located in the northwest quadrant of the Page Road-Chin Page Road intersection proposed to consist of 1,300 residential units, 500,000 square feet of office space and 150,000 square feet of shopping center.

4. Chin Page Office Park (Harris/Stroud Development)

An office development located in the northwest quadrant of the Page Road-Chin Page Road intersection proposed to consist of 550,000 square feet of general office space.

5. Page Road Office Park

A mixed-use project located on the west side of Page Road, north of Comstock Road proposes to consist of 365,000 square feet of general office and 280,000 square feet of medical office space.

6. Page Road Business Park (Hamilton Merritt Development)

A mixed-use project located in the southwest quadrant of Page Road and Chin Page Road intersection proposes to consist of 89,250 square feet of office space, 19,000 square feet of high turn over sit down restaurant, 4,000 square feet fast food restaurant with drive through, a drive in bank with 4 lanes, a gasoline fueling station with 16 pumps and a convenience store.

7. Imperial Tower Hotel

This development is located in the southeast quadrant of Page Road and Emperor Boulevard as a 207 room hotel.

Approved TIP Roadway Improvement Projects Relevant to Proposed Development

1. **NCDOT TIP R2000AF:** This project proposes the construction of the I-540(Northern Wake Freeway) interchange with improvements at I-40 and I-540. The project is anticipated to begin in early 2010.

Trip Generation and Distribution

- 30% to/from the east via I-40
- 30% to/from the west via I-40
- 21% to/from the north via SR 1973 (Page Road)
- 6% to/from the south via SR 1973 (Page Road)
- 7% to/from the west via SR 1969 (Chin Page Road)
- 3% to/from the east via Slater Road
- 1% to from the east via Slater Road
- 2% to from the east via Pleasant Grove Church

Capacity Analysis for Existing and Future Conditions

- Existing (2009) Conditions
- Projected (2015) No-Build Conditions (Existing traffic + Approved Developments)
- Projected (2015) Build-out Conditions (Future No-Build + Site)

Summary of Road Improvements

The Department has reviewed the preliminary site plan and Traffic Impact Analysis (TIA) for Arrindgon Mixed-Use Development prepared by Kimley-Horn and Associates, Inc. (Sealed and dated August 6, 2009). In order to accommodate the site-generated traffic safely and efficiently, while also attempting to protect the functional integrity and operational capacity of the adjacent roadway facilities, we require the following improvements and/or restrictions related to this development. Any additional changes to the site plan must be submitted in writing to the District Office.

SR 1973 (Page Road) Cross Section

This road is currently a two-lane, two-way roadway from north of the I-40 Interchange to SR 1969 (Chin Page Road). Due to lane continuity, capacity, and traffic mobility, it is recommend that SR 1973 (Page Road) provide a four-lane median divided cross-section. This cross-section should commence approx. 1200 feet north of the SR 1973 (Page Road) and SR 1969 (Chin Page Road) intersection and should connect with the multilane I-40 Westbound Ramp and Page Road Intersection. In accordance to the recommendation of a four lane divided facility, an additional through lane should be constructed along SR 1973 (Page Road) across property frontage for the proposed development.

SR 1973 (Page Road) and Slater Road

No geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

I-40 EB Ramp/Emperor Boulevard and SR 1973 (Page Road)

Due to the anticipated impacts that the additional traffic volumes associated with this development may have on the adjacent traffic facilities and with various other geometric improvements that may occur, this intersection may require signal modifications to accommodate this additional traffic volume.

No geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

SR 1973 (Page Road) and I-40 Westbound Ramps

According to the TIA, additional improvements are proposed by others at this location. It should be noted that if the proposed improvements are not provided by others, then this developer should be responsible for these improvements. The following recommendations are based on these improvements.

Northbound SR 1973 (Page Road)

- Construct a second receiving lane from the I-40 Westbound Ramp to Comstock Road as a continuous through lane.
- Construct a second exclusive left turn lane to form dual left turn lanes with a minimum of 150 feet in storage each with adequate taper.

Southbound SR 1973 (Page Road)

- Construct a second exclusive right turn lane to form dual right turn lanes with a minimum of 250 feet of storage each with adequate taper.

Eastbound Westbound I-40 Off-Ramp

- Construct a second exclusive left turn lane to form dual left turn lanes with a minimum of 350 feet of storage each with adequate taper.

SR 1973 (Page Road) and Old Page Road

Although this intersection was not analyzed, the following comments are offered.

Due to the low traffic volumes that use Old Page Road and the close proximity to the I-40 WB Ramp, restricting movements to a right-in/right-out driveway or directional crossover (left-over) should be considered.

SR 1973 (Page Road) and Full Movement Driveway (Westleigh Drive)/Medical Office Park Drive

A Signal is proposed for this intersection and the following information assumes the signal to be in place.

Northbound SR 1973 (Page Road)

- Construct an additional through lane to form dual through lanes.
- Construct an exclusive left turn lane with a minimum of 400 feet of storage with adequate taper.
- Construct an exclusive right turn lane with a minimum of 200 feet of storage with adequate taper.

Southbound SR 1973 (Page Road)

- Construct an additional through lane to form dual through lanes.
- Construct an exclusive right turn lane with a minimum of 100 feet of storage with adequate taper.
- Construct a two-way left turn lane between the full movement driveway and Arrington Park Drive.

Eastbound Office Park Drive

- Construct a three lane cross section with one (1) ingress lane and two (2) egress lanes.
- Construct an exclusive right turn lane with a minimum of 200 feet of storage with appropriate taper.

Westbound Full Movement Drive

- Construct a four (4) lane cross section with one (1) ingress lane and three (3) egress lanes. The egress lanes should consist of dual left turn lanes with a minimum of 250 feet each and a shared through-right turn lane with 300 feet in internal protected stem length before turning maneuvers are allowed.

SR 1973 (Page Road) and Arrington Park Drive/ Office Park Drive

According to the TIA, additional improvements are proposed by others at this location. It should be noted that if the proposed improvements are not provided by others, then this developer should be responsible for these improvements. The following recommendations are based on these improvements and the installation of a traffic signal.

Multiple movements are anticipated to operate at poor levels of service with excessive queuing in the peak hour in the build-out year (2015).

Northbound SR 1973 (Page Road)

- Construct an exclusive right turn lane with a minimum of 200 feet of storage with adequate taper.

Southbound SR 1973 (Page Road)

- Construct an exclusive left turn lane with a minimum of 300 feet of storage with adequate taper.

Westbound Arrington Park Drive

- Construct a five (5) lane cross section with one (2) ingress lane and three (3) egress lanes. The egress lanes should be restriped to consist of dual left turn lanes with a minimum of 250 feet each and a shared through-right turn lane with 350 feet in internal protected stem length before turning maneuvers are allowed.

SR 1973 (Page Road) and Right in/Right out Driveway

Northbound SR 1973 (Page Road)

- Restripe the existing exclusive right turn lane and construct an additional through lane to form dual through lanes.
- Construct an exclusive right turn lane with a minimum of 100 feet of storage with adequate taper.

Southbound SR 1973 (Page Road)

- Construct an additional through lane to form dual through lanes.

Westbound Right-in/Right-out Driveway

- Maintain a two (2) cross section with one (1) ingress and one (1) egress lane with a minimum of 100 feet of internal protected stem length.

SR 1973 (Page Road) and Comstock Road

It is recommended that Comstock Road ultimately be shifted north to align across from the proposed collector road by the Page Road Business Park (Hamilton Merritt) Development. This improvement is not required at this time.

The Arrington Development will be required to strengthen the pavement structure and widen the pavement width to accommodate 10 foot lanes on Comstock Road due to increase use by site generated traffic.

Northbound SR 1973 (Page Road)

- Terminate the second northbound through lane along SR 1973 (Page Road) by striping as an exclusive right turn lane between the right-in/right-out driveway and Comstock Road.

Southbound SR 1973 (Page Road)

- Construct an additional through lane to form dual through lanes.
- Construct an exclusive left turn lane with appropriate storage with adequate taper.

SR 1973 (Page Road) and SR 1969 (Chin Page Road)

According to the TIA, additional improvements are proposed by others at this location. The following recommendations are based on these improvements.

No geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

SR 1973 (Page Road) and Pleasant Grove Church Road

The TIA assumes that this intersection is realigned by others by the build-out year (2015).

General

Cross-access to adjacent properties is strongly encouraged to reduce repetitive trips and provide future alternative routes of ingress/egress.

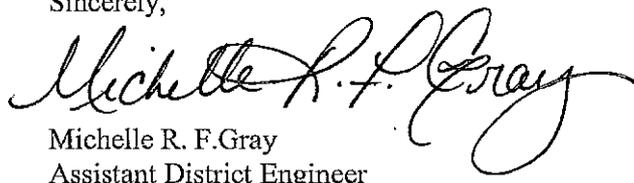
Any pavement marking revisions/modifications necessitated by the development should be the responsibility of the developer and coordinated with the Division Traffic Engineer.

Any roadway modifications or improvements necessitated by the development should be the responsibility of the developer unless otherwise noted.

Reference should also be made to the information included in the "General Recommendations Attachment."

Additional improvements may be required at the driveway permit and encroachment stage when detailed roadway plans are submitted. NCDOT driveway permits will be required for driveways on SR 1973 (Page Road) and Comstock Road. Once the driveway permit has been approved and issued, a copy of the final driveway permit requirements should be forwarded to this office. If we can provide further assistance, please contact me at (919) 220-4750.

Sincerely,

A handwritten signature in black ink, reading "Michelle R. F. Gray". The signature is written in a cursive style with a large, looping "G" at the end.

Michelle R. F. Gray
Assistant District Engineer

Attachment

cc: Mr. H. Wesley Parham, P. E.

General Recommendations Attachment
(For Arrington Mixed Use Development)

Adequate horizontal and vertical sight distances should be reserved at all proposed entrances. Foliage that interferes with sight distance should be cut back to protect lines of sight. The District Engineer should determine if all drainage facilities are adequate. Curb cuts and curb ramps should be constructed in conformance with the "*Guidelines for Curb Cuts and Ramps for Disabled Persons*," if applicable.

The developer may be required to obtain an approved encroachment agreement covering proposed work within the state right-of-way. If this is the case, the encroachment should be cross-referenced to this review.

All street and driveway entrances onto state system roadways should be controlled with appropriate traffic control devices, including but not limited to, stop, yield, directional, regulatory, and advisory signs and pavement markings. All traffic control devices shall conform to the requirements set forth in the Manual on Uniform Traffic Control Devices. Final pavement marking and signing plans should be submitted to the Division Traffic Engineer for approval prior to the installation of any signs and/or pavement markings.

If the developer anticipates adding or petitioning for addition to the state system, all roads/streets should be designed and constructed in conformance with the current North Carolina Department of Transportation design and construction guidelines.

All "outparcels" or "excluded areas" should be served internally with no additional access onto abutting roadways. The developer should convey this condition in any lease or sell agreements.

As required by the "*Policy on Street and Driveway Access to North Carolina Highways*," dated July 2003, the applicant is responsible for identifying all right-of-way and/or control-of-access limits and for including this information on all submittals. Failure to accurately disclose R/W and C/A limits could result in the denial or closure of access points.

Any additional development, either within this site or adjacent to this site, that intends on using this development's access will require an updated driveway permit and re-evaluation of geometric and traffic control needs.

All widening should include appropriate transitional and deceleration tapers. Recommended turn lane and transitional treatments are shown on pages 78 and 79 of the "*Policy on Street and Driveway Access to North Carolina Highways*," dated July 2003.

Where possible, opposite side driveways should be aligned to prevent the operational and safety problems caused by offset driveways.