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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

September 19, 2012

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

Subject: Proposed Carolina Crossing II Development Traffic Impact Analysis

The proposed Carolina Crossing II Development is located on the northwest quadrant of the NC 54 and SR 1109 (Farrington Road) intersection in Durham County, North Carolina. The proposed development will consist of two (2) medical office buildings totaling 168,000 square feet with an anticipated build out of 2013 and an analysis year of 2014. The proposed development is projected to generate 6,655 unadjusted daily trips with 284 A.M. peak hour site trips and 292 P.M. peak hour site trips.

The TIA analyzed the following eight (8) intersections:
- NC 54 and I-40 Westbound Ramp- Signalized
- NC 54 and I-40 Eastbound Ramps- Unsignalized
- NC 54 and SR 1109 (Farrington Road) - Signalized
- NC 54 and Celeste Circle / Falconbridge Road - Unsignalized
- Celeste Circle and NC 54 Service Road - Unsignalized
- SR 1109 (Farrington Road) and SR 2268 (Cleora Drive) – Unsignalized
- SR 2268 (Cleora Drive) and Site Driveway #1 - Unsignalized
- SR 2268 (Cleora Drive) and Site Driveway #2 – Unsignalized

Approved Surrounding Developments
There are no approved developments in the vicinity of the study area.

TIP Roadway Improvement Projects Relevant to Proposed Development
There are no funded NCDOT TIP roadway improvement projects in the vicinity of the study area.
The draft NC 54 Corridor Study has been completed and includes recommendations for the vicinity of this development. Improvements necessitated by the development are consistent with the study to the degree that its generated traffic impacts the corridor.

Trip Generation and Distribution
- 35% to/from the west via NC 54
- 10% to/from the north via SR 1109 (Farrington Road)
- 10% to/from the south via SR 1109 (Farrington Road)

- 15% to/from the north via I-40
- 15% to/from the south via I-40
- 15% to/from the north via NC 54

Capacity Analysis for Existing and Future Conditions
- Existing (2013) Conditions
- Projected (2014) No-Build Conditions (Existing traffic + 3% Background Growth)
- Projected (2014) Build Improved Conditions (Existing traffic + 3% Background Growth)

Summary of Road Improvements
The Department has reviewed the preliminary site plan, Traffic Impact Analysis (TIA), and Supplemental Analysis for the Carolina Crossings II Development prepared by Kimely Horn and Associates, Inc. (Sealed and dated March 15, 2012 and August 17, 2012). 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 recommend 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.

NC 54 and I-40 Westbound Ramp Intersection
No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

NC 54 and I-40 Eastbound Ramp Intersection
No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

NC 54 and SR 1109 (Farrington Road) Intersection
Multiple movements are proposed to operate at a poor level of service with excessive queuing in the peak hour in the analysis year (2014) of the development. The following recommendations should accommodate the site-generated traffic, but do not include all improvements necessary to allow the intersection to attain acceptable levels of service with acceptable queuing.

Westbound NC 54
- Construct an exclusive right turn lane with full storage and appropriate taper.

Eastbound NC 54
- Extend the existing exclusive left turn lane to a minimum of 300 feet each of full storage and appropriate taper.
- Construct an exclusive right turn lane with full storage and appropriate taper.

Southbound SR 1109 (Farrington Road)
- Construct dual exclusive left turn lanes with a minimum of 250 feet each of full storage and appropriate taper with a monolithic island from this intersection to the SR 1109 (Farrington Road) and SR 2268 (Cleora Drive) intersection.

NC 54 and Celeste Circle / Falconbridge Road Intersection
No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

Celeste Circle and NC 54 Service Road Intersection
No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic.

SR 1109 (Farrington Road) and SR 2268 (Cleora Drive) Intersection
Northbound SR 1109 (Farrington Road) Drive

- Restripe the existing two way left turn lane and construct an exclusive left-turn lane with adequate full storage and appropriate taper with a monolithic island from this intersection to the SR 1109 (Farrington Road) and NC 54 intersection.

Eastbound SR 2268 (Cleora Drive)

- Construct an exclusive left turn lane with adequate full storage and appropriate taper.

***SR 1109 (Farrington Road) and Existing Northern Site Drive (Development on eastern side)**
Southbound SR 1109 (Farrington Road) Drive

- Re-establish turn lane to this existing development by constructing an exclusive left turn lane with adequate full storage and appropriate taper.

SR 2268 (Cleora Drive) and Site Driveway #1 Intersection
Northbound Proposed Site Drive #1

- Construct a two (2) lane cross-section consisting of one ingress lane and one egress lane. The egress lanes should consist of a shared left and right-turn lane.

SR 2268 (Cleora Drive) and Site Driveway #2 Intersection
Northbound Proposed Site Drive #2

- Construct a two (2) lane cross-section consisting of one ingress lane and one egress lane. The egress lanes should consist of a shared left and right-turn lane.

General

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

Due to, but not limited to, the comments and recommendations from this review of the proposed developments, changes in the internal circulation may be necessary to ensure that driver confusion is minimized to the maximum extent possible.

Any signal revisions, modifications, or additions necessitated by the development should be coordinated with the Regional Traffic Engineer, the Division Traffic Engineer, the Signals and Geometrics Section and the City of Durham.

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."

NCDOT driveway permits will be required for driveway access on SR 2268 (Cleora Drive). 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.

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Sincerely,

Michelle R. F.Gray
Acting District Engineer

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

General Recommendations Attachment
(For Carolina Crossing II)

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.

Unless otherwise noted, a recommended width of 40 feet (curb face to curb face) should be used at each drive. It is also recommended that 40 feet (minimum) radii should be used at each drive to accommodate any service type vehicles or truck traffic that may visit the site.

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.

Adequate right-of-way for widening and sight distance triangles should be reserved. Any additional development, either within this site or adjacent to this site, that intends on using the developments access will require an updated driveway permit and re-evaluation of geometric and traffic control needs

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.