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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

April 21, 2009

To: Mr. Hugh Osteen
Durham County Public Schools
2011 Hamlin Road
Durham, NC 27704

Subject: Hebron Elementary School Traffic Impact Analysis

The proposed Hebron Elementary School site developed by Coulter, Jewell, and Thames is located along the southeast area of the SR 1656 (Hebron Road) and SR 1004 (Old Oxford Road) intersection in northern Durham County, North Carolina. The Hebron Elementary School includes an elementary school with an initial enrollment of 800 students with an anticipated build-out year of 2010 and analysis year 2011. The proposed development is projected to generate 1,057 daily trips with 690 A.M. peak hour site trips and 273 P.M. peak hour site trips.

Scope

The TIA analyzed the following seven (7) intersections:

- SR 1004 (Old Oxford Road) and SR 1656 (Hebron Road) - Signalized
- SR 1004 (Old Oxford Road) and Site Drive #1 – Future Unsignalized
- SR 1004 (Old Oxford Road) and Wolfpack Lane - Unsignalized
- SR 1004 (Old Oxford Road) and SR 1633 (Hamlin Road) - Signalized
- SR 1656 (Hebron Road) and Site Drive #2 – Future Unsignalized
- SR 1656 (Hebron Road) and Swanns Mill Drive – Unsignalized
- SR 1656 (Hebron Road) and Danube Lane – Unsignalized

Approved Surrounding Developments

1. **Treyburn Residential**
   A residential development on the east side of Sawmill Parkway and consists of 221 single-family residential units proposed for build-out in 2010.

2. **Treyburn Retail**
   A mixed use development in the southern quadrant of Roxboro road and Orange Factory Road that consist of a 43,359 square foot supermarket, a 23,400 square foot shopping center, a bank with 3 drive- through windows, a 5,000 square foot high turnover sit down restaurant, and a 14,418 square foot pharmacy with a drive through window. The development had a proposed build out for 2008.

3. **Belvin Property**
   A residential development is located in the southeast and southwest quadrants of Hebron Road and Danube Lane that consist of 221 single family residential units, 264 apartments, and 208 townhomes. The development had a proposed build out of 2005.

4. **Swanns Mill Subdivision**
A residential development located on the north side of Hebron Road approximately 1,300 feet west of Old Oxford Road that consist of townhomes and single family homes. The development does not have a projected build-out date.

Approved TIP Roadway Improvement Projects Relevant to Proposed Development

1. **NCDOT TIP U-4721**: This project proposes the construction of the Northern Durham Parkway north of the proposed school site along SR 1004 (Old Oxford Highway). The project is anticipated to begin in 2012 but is currently unfunded.

Trip Generation and Distribution

- 5% to/from the west via Hebron Road
- 20% to/from the south via Danube Lane
- 5% to/from the north via Danube Lane
- 5% to/from the north via Swanns Mill Drive
- 10% to/from the north via Old Oxford Road
- 25% to/from the east via Hamlin Road
- 30% to/from the south via Old Oxford Road

Capacity Analysis for Existing and Future Conditions

- Existing (2008)
- Projected (2011) No-Build Conditions (Existing traffic + Approved Developments + Background Growth)
- Projected (2011) Build Conditions (Existing Traffic + Approved Developments + Background Growth + Elementary School Traffic)

Summary of Road Improvements

The Department has reviewed the preliminary site plan and Traffic Impact Analysis (TIA) for the Hebron Elementary School prepared by Martin Alexiou Bryson. (Sealed and dated December 11, 2008). 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 1004 (Old Oxford Road) and SR 1656 (Hebron 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 will require signal modifications to accommodate this additional traffic volume.

<u>Northbound SR 1004 (Old Oxford Road)</u>

- Construct an exclusive left turn lane with a minimum of 250 feet of storage and appropriate taper.

<u>Eastbound SR 1656 (Hebron Road)</u>

- Construct an exclusive left turn lane with a minimum of 275 feet of storage forming a continuous left turn lane back to an exclusive left turn lane at Site Drive #2.

SR 1004 (Old Oxford Road) and Site Access #1

Northbound SR 1004 (Old Oxford Road)

- Construct an exclusive left turn lane with a minimum of 250 feet of storage and appropriate taper.

Southbound SR 1004 (Old Oxford Road)

- Construct an exclusive right turn lane with a minimum of 125 feet of storage and appropriate.

Eastbound Proposed Site Access #1

- Construct to a three (3) lane cross-section consisting of one (1) ingress and two (2) egress lanes providing one (1) exclusive right-turn lane and one (1) exclusive left-turn lane with a minimum of 200 feet of internal storage.

SR 1004 (Old Oxford Road) and Wolfpack Lane /Private Driveway

No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic. This intersection should be monitored for future signalization.

SR 1004 (Old Oxford Road) and SR 1634 (Hamlin Road)

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

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.

SR 1656 (Hebron Road) and Site Drive #2

Westbound SR 1656 (Hebron Road)

- Construct an exclusive left turn lane with a minimum of 100 feet of storage forming a continuous left turn lane back to the turn lane at the intersection of SR 1656 (Hebron Road) and SR 1004 (Old Oxford Road).

Northbound Proposed Site Access #2

- Construct to a two (2) lane cross-section consisting of one (1) ingress and one (1) egress lanes providing a shared right-left turn lane with a minimum of 200 feet of internal storage.

SR 1656 (Hebron Road) and Swanns Mill Drive

No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic. This intersection should be monitored for future signalization.

SR 1656 (Hebron Road) and Danube Lane

No future geometric improvements are necessary at this intersection at this time to mitigate site-generated traffic. This intersection should be monitored for future signalization.

It is recommended that the installation of a sidewalk be put in place along the frontage of the school on SR 1004 (Old Oxford Road) and SR 1656 (Hebron Road). The installation of this sidewalk would provide a safe walking route for students in the surrounding neighborhoods who may be walking to the proposed school site.

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."

NCDOT driveway permits will be required for driveway access on SR 1004 (Old Oxford 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,

Michelle R. F. Gray
Assistant District Engineer

Attachment

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

General Recommendations Attachment
(For Hebron Elementary)

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.