

FEASIBILITY STUDY

FS-0206B

**Widening SR 1437 (Shaw Road)/SR 1615
(Rosehill Road and Stacey Weaver Drive) From
Bragg Blvd To Ramsey Street**

City of Fayetteville

**Cumberland County
Division 6**



Prepared by the
Program Development Branch
N. C. Department of Transportation

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3/23/07
Date

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I. General Description

This feasibility study describes the interconnection and widening of Shaw Road/Rosehill Road and Stacy Weaver Drive from Bragg Blvd. to Ramsey Street, a distance of 5.2 miles.

The interconnection of Shaw Road/Rosehill Road and Stacy Weaver Drive is accommodated by an extension of Shaw Road. The project location is shown on Figures 1, 2 and 3. As part of this study, two different alignments with two different cross sections were investigated and the associated costs with the breakdowns are described below:

- * ***ALTERNATE*** 1. Four-lane divided curb and gutter section and 30-foot raised grass median from Bragg Blvd. to Ramsey Street. The majority of this alternative is symmetrical along the existing roadways with an extension of Shaw Road from Murchison Road to Rosehill Road to improve east-west connectivity in the area. This alternative proposes a new interchange over Murchison Road with a grade separation of the CSX Railroad. The proposed Right of Way is 130-feet. See Figure 2.

- * ***ALTERNATE*** 2. Five-lane curb and gutter section from Bragg Blvd. to Ramsey Street. The majority of this alternative is symmetrical along the existing roadways with an extension of Shaw Road from Murchison Road to Rosehill Road to improve east-west connectivity in the area. This alternative proposes a new interchange

over Murchison Road with a grade separation of the CSX Railroad. The proposed Right of Way is 130-feet. See Figure 2.

- * **ALTERNATE 3.** Four-lane divided curb and gutter sections and 30-foot raised grass median from Bragg Blvd. to Ramsey Street. The majority of this alternative is symmetrical along the existing roadways with a partial realignment of Shaw Road and Rosehill Road to improve east-west connectivity. This alternative also has a proposed interchange with Murchison Road at Shaw Mill Road and a grade separation of the CSX railroad-junction with Shaw Mill Road. The proposed Right of Way is 130-feet. See Figure 3.

- * **ALTERNATE 4.** Five-lane curb and gutter section from Bragg Blvd. to Ramsey Street. The majority of this alternative is symmetrical along the existing roadways with a partial realignment of Shaw Road and Rosehill Road to improve east-west connectivity. This alternative also has a proposed interchange with Murchison Road at Shaw Mill Road and a grade separation of the CSX railroad junction with Shaw Mill Road. The proposed Right of Way is 130-feet. See Figure 3.

This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of the study is to describe the problem, recommend a treatment including costs, and identify potential problem areas that deserve consideration in the planning and design phases.

II. Background

The primary purpose of this project is to provide improved traffic operations and safety by providing a continuous multi-lane east-west corridor between Bragg Boulevard and Ramsey Street, along the general alignments of Shaw Road, Rosehill Road and Stacy Weaver Drive. Under one alignment, the interconnection of these facilities is accomplished by an

extension of Shaw Road. Under the other alignment, the interconnection of these facilities is accomplished by a realignment of Shaw Road and Rosehill Road. A multi-lane facility is recommended for this corridor because of the projected future traffic volumes.

This project is supported by the Fayetteville Urban Area MPO and endorsed by the Mid-Carolina RPO.

In the North Carolina Statewide Functional Classification System, Shaw Road and Rosehill Road are designated as minor arterials while Stacy Weaver Drive is designated as a collector. In the 2004 Fayetteville MPO Area and Cumberland County Thoroughfare Plan, all routes are designated as major thoroughfares.

As it exists now, this section of Shaw Road, Rosehill Road/Stacy Weaver Drive is primarily a two-lane shoulder section with a pavement width of 28-feet. Additional widening at Bragg Blvd., McArthur Road and Ramsey Street are provided in order to accommodate left turn lanes.

The land immediately surrounding the project area at the western end is mostly undeveloped property with some scattered single-family residences including some singlewide trailer homes. The eastern end of the project is predominantly single-family homes with some scattered businesses including grocery stores and gas stations. Also, it should be noted that along the project corridor are two private schools, two public schools, a county library, one recreation center, one fire station and three churches.

At the western end of the project, planning and design for TIP Project U-3432, the widening of Bragg Boulevard to a six-lane facility from US 401 Bypass to North of SR-1437 (Santa Fe Drive/Shaw Road) is in progress.

CSX 'AE' Line currently operates a railway which runs from Vander to Fort Bragg and connects the CSX 'A' Line with the Cape Fear Railways. This railway carries one (1) train per day at a maximum speed of 10 mph in the area. Based on the Policy and Procedures Manual, a railroad grade separation should be provided if the exposure index is 30,000 or greater for urban area. The cumulative exposure index for the Shaw Road Extension/Shaw Mill Road crossings is anticipated to be approximately 29,700 by the 2035 design year. Given this information a railroad grade separation at either of these locations is not mandatory, but is very close to being warranted

based on volume. Given the parallel proximity of Murchison Road to the railroad in this area, a grade separation with an adjacent interchange for the Shaw Road Extension or Shaw Mill Road alternatives is highly desirable.

III. Traffic and Safety

The current year (2006) Average Daily Traffic (ADT) within the project limits is 16,500 vehicles per day (vpd) at the west end (Shaw Road segment) to 16,800 vpd at the east end (Stacey Weaver Drive segment). For the design year 2035 build scenario, the estimated traffic volumes within the project limits ranges from 22,100 vehicles per day (vpd) at the west end of the project to 22,800 vpd at the east end of the project. With the likelihood that movements on Shaw Mill Road will be restricted, the traffic projections near the Murchison Road are anticipated to be 18,800 vpd in the current year and 29,700 vpd in the 2035 design year. Truck traffic is estimated to make up 3% of the ADT traffic.

There are four existing signals within the project limits. They are located at Shaw Road and Bragg Blvd, Shaw Road and Murchison Road, McArthur Road and Rosehill Road and Stacy Weaver Drive and Ramsey Street.

The existing signals at Shaw and Murchison and at Rosehill and McArthur are currently operating at an acceptable LOS "C". Based on the projected volume for the design year 2035, these intersections will be operating at LOS "F" in design year; however, with the proposed upgrade of the facility, both intersections are expected to operate at LOS "D" or better in design year.

The existing signals at Bragg Blvd/Shaw Road and at Ramsey Street/Stacy Weaver Drive are currently operating at a LOS "F". While the proposed geometric upgrade on Bragg Blvd/Shaw Road and on Ramsey Street/Stacey Weaver Drive will improve their operations, the necessary improvements needed for an acceptable LOS at these intersections are well beyond the scope of this study.

During the three-year period from January 2000 through December 2002, there were 249 accidents reported within the project limits. 137 of these crashes were property damage only accidents, 112 were injury crashes and there were no fatalities as a result of these accidents. The accident rate for

this 5.2 mile portion of roadway was 402.50 accidents per 100 million vehicle miles of travel (acc/100mvm), which was lower than the 2000-2002 statewide rate of 503.69 accidents/100 mvm for two-lane undivided urban secondary routes.

The most prevalent accident types along this corridor are as follows: approximately 40 percent of accidents were rear end, slow or stop; 12 percent were with left turn, same roadway; and 10 percent were angle accidents. Improvements to upgrade this section of roadway to a multilane facility should reduce the likelihood of these types of accidents.

IV. Description of Alternatives

Alternatives 1, 2, 3 and 4 include a new interchange at Murchison Road with a grade separation of the adjacent CSX Railroad.

The construction cost estimate shown below for each alternative includes the installation of a five (5) foot sidewalk, on both sides of the road within the project limits. This sidewalk is estimated to cost an additional \$530,000 per side.

Additional intersection improvements are necessary at McArthur Road. Along with the proposed multi-lane widening of Rosehill Road/Stacy Weaver Drive, the addition of auxiliary lanes at McArthur Road will enhance the traffic safety and operations of this facility. These costs are included in all alternates below.

ALTERNATE 1. Construct four-lane divided curb and gutter section with 30-foot raised grass median, 82-foot wide face to face of curbs with 15-foot berms on 130-foot of right-of-way. In addition to the conditions mentioned above, Alternative 1 proposes widening along existing Shaw Road symmetrically with some slight realignment aimed at improving several existing curves between Bragg Blvd and Murchison Road. Then proceeding on new location with an extension of Shaw Road between Murchison Road and Rosehill Road. Finally this alternative continues east symmetrically along the existing Rosehill Road and Stacey Weaver Drive until it intersects with Ramsey Street. The length of this alternative is approximately 5.3 miles. See Figure 2.

With this alternative, 58 residences are expected to be relocated and 19 of these homes are mobile homes. Also, zero (0) businesses are impacted due to this alternative. The total cost of the alternative, including construction and right-of-way is estimated to be \$66,800,000.

Construction	\$47,600,000
Right-of-Way.....	\$19,200,000
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Total Project Cost (Alternative 1).....	\$66,800,000

ALTERNATE 2. Construct five-lane curb and gutter sections, 64-foot wide face to face of curbs with 15-foot berms on 130-foot right-of-way. In addition to the conditions mentioned above Alternative 2 proposes widening along existing Shaw Road symmetrically with some slight realignment aimed at improving several curves between Bragg Blvd. and Murchison Road. Then proceeding on new location with an extension of Shaw Road between Murchison Road and Rosehill Road. Finally this alternative continues east symmetrically along the existing Rosehill Road and Stacey Weaver Drive until it intersects with Ramsey Street. The length of this alternative is approximately 5.3 miles. See Figure 2.

With this alternative, 58 residences are expected to be relocated and 19 of these homes are mobile homes. Also, zero (0) businesses are impacted due to this alternative. The total cost of the alternative, including construction and right-of-way is estimated to be \$61,200,000.

Construction	\$42,000,000
Right-of-Way.....	\$19,200,000
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Total Project Cost (Alternative 2).....	\$61,200,000

ALTERNATE 3. Construct four-lane divided curb and gutter sections and 30-foot raised grass median, 82-foot wide face to face of curbs with 15-foot berms on 130-foot of right-of-way. In addition to the conditions mentioned above, Alternative 3 proposes widening along existing Shaw Road with some realignment aimed at improving several existing curves between Bragg Blvd and Murchison Road. In order to interconnect these roadways, Shaw Road is realigned to intersect Murchison Road at the Hogan Street/Shaw Mill Road intersection and Rosehill Road is realigned to Shaw Mill. It then continues symmetrically East on Rosehill Road and Stacey

Weaver Drive until it intersects with Ramsey Street. The length of this alternative is approximately 5.1 miles. See Figure 3.

With this alternative, 47 residences are expected to be relocated and 27 of these homes are mobile homes. Also, 6 businesses are impacted due to this alternative. The total cost of the alternative, including construction and right-of-way is estimated to be \$74,600,000.

Construction	\$47,800,000
Right-of-Way.....	\$26,800,000
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Total Project Cost (Alternative 3).....	\$74,600,000

ALTERNATE 4. Construct five-lane curb and gutter sections, 64-foot wide face to face of curbs with 15-foot berms on 130-foot of right-of-way. In addition to the conditions mentioned above, Alternative 4 proposes widening along existing Shaw Road with some realignment aimed at improving several existing curves between Bragg Blvd and Murchison Road. In order to interconnect these roadways, Shaw Road is realigned to intersect Murchison Road at the Hogan Street/Shaw Mill Road intersection and Rosehill Road is realigned to Shaw Mill. It then continues symmetrically East on Rosehill Road and Stacey Weaver Drive until it intersects with Ramsey Street. The length of this alternative is approximately 5.1 miles. See Figure 3.

With this alternative, 47 residences are anticipated to be relocated and 27 of these homes are mobile homes. Also, 6 businesses are impacted due to this alternative. The total cost of the alternative, including construction and right-of-way is estimated to be \$68,400,000.

Construction.....	\$41,600,000
Right-of-Way.....	\$26,800,000
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Total Project Cost (Alternative 4).....	\$68,400,000

V. Other Alternatives Considered

Given the available information, we did consider alternatives that provided an at-grade railroad crossing and intersection at Murchison Road instead of the interchange with railroad grade separation. With all remaining recommendations the same for all alternatives, the removal of the interchange and railroad grade separation at Murchison Road reduces the overall costs by approximately 12 million for alternatives 2A & 4A and reduces the overall cost by 13.8 million for alternatives 1A & 3A. While we recommend that the railroad grade separation and interchange at Murchison Road be included in the project scope at this time, this recommendation should be further evaluated and validated during later planning and design studies.

VI. Recommendations

The analyses for both the four-lane divided curb and gutter sections with 30-foot raised grass median and the five-lane curb and gutter sections indicates that either of these alternatives would accommodate the projected 2035 design year volumes with an acceptable level of service at each intersection, except Shaw Road/Bragg Blvd and Stacey Weaver Drive/Ramsey Street intersections. These intersections are expected to operate at level of service "F" and the additional improvements needed to achieve a level of service "D" or better are well beyond the scope of this project.

Although 130-foot right-of-way is utilized for all alternatives, the cost difference between four-lane divided curb and gutter and the five-lane curb and gutter sections ranges between \$6.0 million and \$7.1 million; in favor of the five-lane cross-sections. However, five-lane sections tend to promote strip development and indiscriminate left turn movements; while four-lane divided sections minimize strip development, prevent indiscriminate left turn movements, and provide refuge for pedestrians if needed. Therefore, from a traffic operational and safety perspective, the four-lane divided cross-sections (Alternatives 1 and 3) are preferred over the five-lane sections (Alternatives 2 & 4).

Alternative 3 was not selected over Alternative 1 because of the severe impact it will have on the surrounding community and increased costs of

right of way. Alternative 3 alignment seriously impacts Fayetteville Christian Church, Warenwood Elementary School and the Westarea Volunteer Fire Department. In addition, Alternative 3 cost approximately \$10 million dollars more than Alternative 1 for a similar facility. In light of these reasons, Alternative 1 is the recommended alternative at this time. However, environmental justice issues are anticipated along Shaw Road Extension and further investigation will be required during later planning and design stages.

VII. Natural and Environmental Issues

An exhaustive environmental screening was not conducted for this study. However, the following information summarizes conclusions about the project study area based on existing data.

There are no properties listed on the National Register of Historic Places within the immediate vicinity of the proposed improvements. There are also no known archaeological sites within the project study area. However, the permitting requirements and compliance with section 4(f) may apply to Alternatives 3, 3A, 4 and 4A.

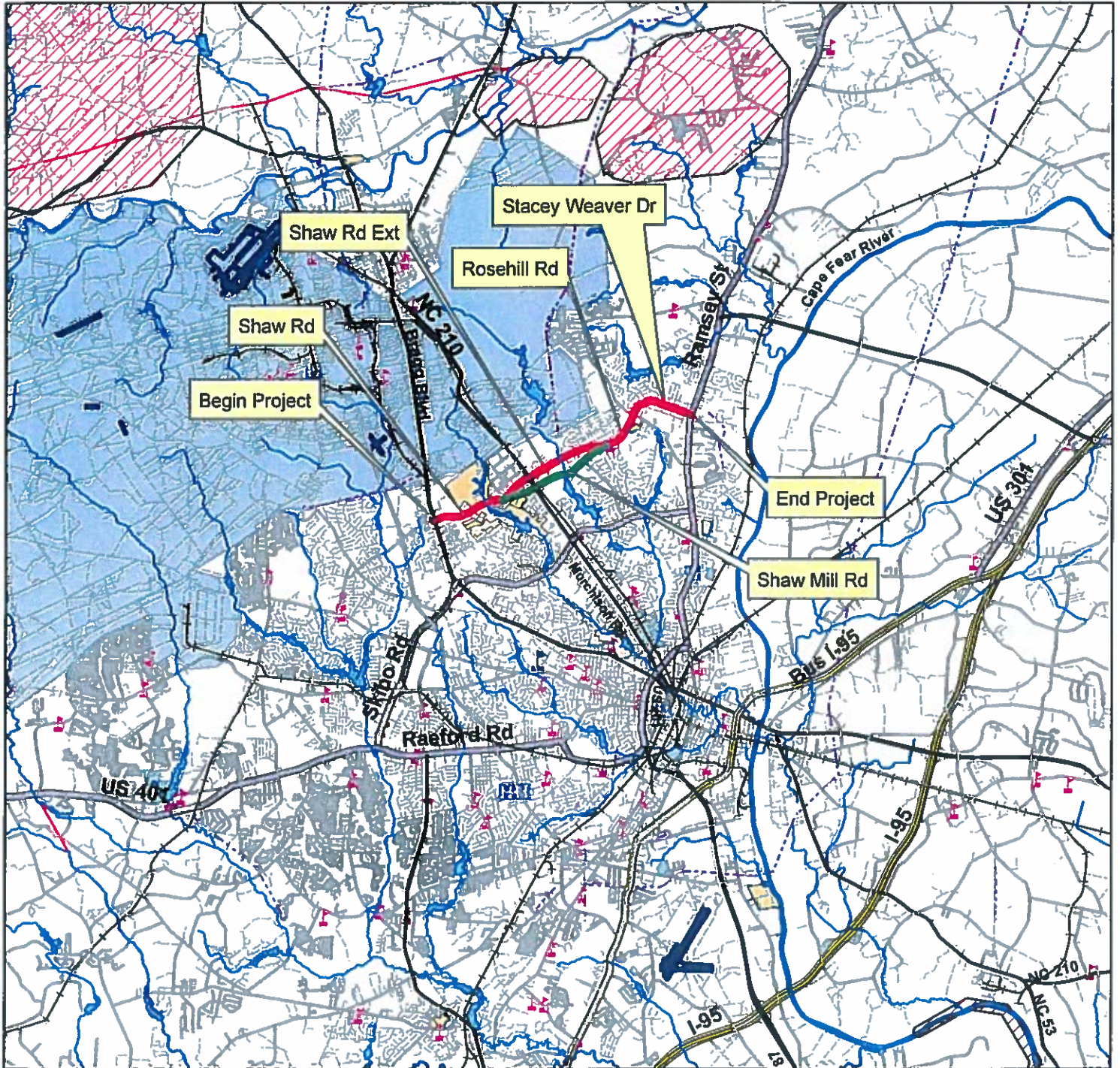
According to the National Heritage Program GIS database, there is a Dedicated Nature Preserve (Donnie Boone/Kornbow Lake Registered Heritage Area) and some endangered species are anticipated within this area. Also, the city owned property along the Little Cross Creek in this area is designated lands managed for conservation and open space. Rosehill Road Park (city owned) is located on the south side of Rosehill Road just west of McAuthur Road. The proposed project corridor crosses wetlands associated with the Big Cross Creek and Little Cross Creek; therefore, both 404 permit and a 401 certification will be required on this project.

In the area east of Murchison Road, there are potential environmental justice issues due to the proposed re-alignment of Shaw Road, which impacts a minority community along Shaw Road Extension.

No provisions for bicycles have been included in this report.

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Figure 1



Project Limits

- Alt 1, 1A, 2 & 2A
- Alt 3, 3A, 4 & 4A

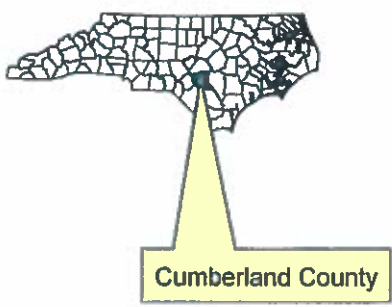


FIGURE 2
(Alternatives 1, 1A, 2 & 2A)



— Existing Alignment
— Proposed Realignment & Connector (Alt. 1, 1A, 2 & 2A)
— 130' Proposed RW
SCALE = 700m : 1"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Project Number: FS - 02068
 Description: Widening SR 1431 (Shaw Road) / SR 655 (Rosehill Road and Stacy Weaver Drive) from Brogg Blvd. to Ramsey Street
 City: Fayetteville
 County: Cumberland
 Division: 6

NO.	DATE	BY	REVISIONS	SHEET
1				1
2				2
3				3

SCALE