FEASIBILITY STUDY

FS-0310C

Widening NC 84 (Weddington Road) From NC 16 (Providence Road) To SR 1349 (Airport Road)

Union County

Division 10

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

Henry U. Esealuka
Feasibility Studies Engineer

Derrick W. Lewis, P.E.
Feasibility Studies Unit Head

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Date

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I. General Description

This feasibility study describes roadway improvements along NC 84 (Weddington Road) from NC 16 (Providence Road) to just east of the proposed relocation of SR 1349 (Airport Road) as proposed in FS-0210A. The project location is shown on Figures 1, 2 and 3. As part of this study, two alternatives were investigated and are described below:

ALTERNATE 1. Four-lane divided curb and gutter section, 79 feet wide face to face of curbs with a 23-foot raised grass median and 15-foot berms on 130 feet right-of-way. The proposed widening is symmetrical along existing Weddington Road for the entire length of the project. The length of the alternative is approximately 7.5 miles.

ALTERNATE 2. Four-lane divided curb and gutter section, 79 feet wide face to face of curbs with a 23-foot raised grass median and 15-foot berms on 130 feet right-of-way. The proposed widening is on new location along TIP Project U-3467 (Rea Road Extension) starting at the intersection of NC 16 and SR 1316 until it intersects with Weddington Road, then continues symmetrically along existing Weddington Road for the remaining length of the project. The length of the alternative is approximately 7.1 miles.

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 purpose of this project is to improve the traffic safety and operations along this section of NC 84 as well as improve access to the surrounding community.

This section of NC 84 (Weddington Road) is primarily a two-lane shoulder section with a pavement width of 26 feet. Additional widening is provided at some of the intersections in order to accommodate left turn lane(s).

In the Mecklenburg-Union County Thoroughfare Plan, NC 84 (Weddington Road) is designated as minor thoroughfare between NC 16 and Rea Road Extension. Between Rea Road Extension and Airport Road, NC 84 is designated as major thoroughfare.

Land use along the corridor is predominantly residential mix with scattered businesses as well as some large undeveloped tracts.

There are three adjacent TIP projects in the area that proposes to upgrade NC 16 (Old Providence Road)/NC 84 (Weddington Road) to a multilane facility, these projects are described below:

- U-2510A- Proposes to upgrade NC 16 (Old Providence Road) from south of SR 2948 (Rea Road Extension) in Union County to south of I-485 (Charlotte Outer Loop) in Mecklenburg County.

- U-3467- SR 1316 (Rea Road Extension) NC 16 to SR 1008 (Indian Trail-Waxhaw Road). Construct/Upgrade to multi-lanes with part on new location and part along existing NC 84 in this area.

- FS-0210A- SR 1349 (Airport Road), NC 84 (Weddington Road) to SR 1162 (Goldmine Road). Upgrade roadway, some new location.

There are three structures located along the project route which are described as follows:

1. Structure #16 is a triple Reinforced Concrete Box Culvert (RCBC) located approximately 1.0 mile east of SR 1341 and carries NC 84 over Twelve Mile Creek. The total length of this structure is 35 feet with a

20 feet horizontal clearance. It was constructed in 1949 and has a sufficiency rating of 98.2 points.

2. Structure #39 is a triple RCBC located approximately 0.9 miles east of SR 1008 and carries NC 84 over Price Mill Creek. The total length of this structure is 35 feet with a 24 feet horizontal clearance. It was constructed in 1960 and has a sufficiency rating of 98.8 points.

3. Structure #472 is also a triple RCBC located approximately 1.0 mile east of SR 1162 and carries NC 84 over E. Fork Twelve Mile Creek. The total length of this structure is 44 feet with a 20 feet horizontal clearance. It was constructed in 1949 and has a sufficiency rating of 98.6 points.

III. Traffic and Safety

The current year Average Daily Traffic (ADT) within the project limits ranges from 9,100 vehicles per day (vpd) at the east end to 15,000 vpd at the west end. For the design year 2030 build scenario, the estimated traffic within the project limit ranges from 18,600 vpd at the east end to 29,600 vpd at the west end near NC 16, without the Rea Road Extension in place. If the Rea Road Extension is in place, the estimated traffic volumes for the 2030 design year within the project limits ranges from 18,600 vehicles per day (vpd) at the east end of the project to 25,600 vpd just east of the proposed Rea Road Extension. Under this scenario, the projected 2030 design year traffic volume west of the proposed Rea Road Extension is estimated to be 18,800 vpd. Under all options, the truck traffic is estimated to make up 7% of the ADT.

Under all options, the 2030 design year ADT along the proposed Rea Road Extension between NC 16 and Weddington Road is estimated to be 15,800 vpd while the truck traffic is estimated to make up 7% of the ADT.

During the three-year period from April 2004 through March 2007, there were 195 accidents reported within the project limits. 126 of these crashes were property damage only accidents, 69 were injury crashes with one (1) fatality as a result of these accidents. The accident rate for this 7.5 mile portion of roadway was 243.57 accidents per 100 million vehicle miles of travel (acc/100mvm), which was slightly lower than the 2004-2007 statewide rate of 280.39 accidents/100 mvm for two-lane undivided primary routes.

The most prevalent accident types along this corridor are as follows: approximately 33 percent of accidents were rear end, slow or stop, 18 percent were with left turn, 11 percent were angle accidents and 14 percent were fixed object accidents. Individually, all other accident types are approximately twenty-four (24) percent or less of total accidents. Improvements to upgrade this section of roadway to a multilane facility should reduce the likelihood of these types of accidents.

There are three existing signals within the project limits. They are located at NC 16 (Providence Road), SR 1008 (Waxhaw-Indian Trail Road) and at the intersection of SR 1162 (Wesley Chapel Road/Porter Road).

Currently, this section of NC 84 is operating at a level of service (LOS) "C". If no improvements are made, this facility will operate at a LOS "F" in the 2030 design year. However, with the recommended improvements in this report, this section of NC 84 is expected to operate at a LOS "D" or better in the 2030 design year

IV. Description of Alternatives

ALTERNATE 1. Construct four-lane divided curb and gutter section and 23-foot raised grass median, 79 feet wide face to face of curbs with 15-foot berms on 130 feet proposed right-of-way. The proposed widening is symmetrical along existing Weddington Road for the entire length of the Project, see Figures 1, 2 and 3. The length of the alternative is approximately 7.5 miles.

With this alternative, zero resident relocation and zero business relocations are expected. The total cost of the alternative, including construction, utility relocation and right-of-way is estimated to be $57,000,000, see Table A below.

Construction	$40,500,000
Right-of-Way	$11,500,000
Utility Relocation	$ 5,000,000
Total Project Cost (Alternative #1)	$57,000,000

ALTERNATE 2. Four-lane divided curb and gutter section, 79 feet wide face to face of curbs with a 23-foot raised grass median and 15-foot berms on 130 feet right-of-way. The proposed widening is on new location under TIP Project U-3467 (Rea Road Extension) starting at the intersection of NC 16 and SR 1316 until it intersects with Weddington Road, then continues symmetrically along existing Weddington Road for the remaining length of the project, see Figures 1, 2 and 3. The length of the alternative is approximately 7.1 miles.

With this alternative, zero resident relocation and zero business relocations are expected. The total cost of the alternative, including construction, utility relocation and right-of-way is estimated to be $54,900,000, see Table A below.

Construction	$39,300,000
Right-of-Way.....	$11,100,000
Utility Relocation.....	$ 4,500,000
Total Project Cost (Alternative #2).....	$54,900,000

The construction cost estimate shown above for alternatives #1 and #2 includes the installation of a five (5) foot sidewalk on both sides of NC 84 beginning at NC 16 and ending at SR 1349 (Airport Road), a total distance of 7.5 to 7.1 miles at $1.8 to $1.7 million respectfully.

Under FS-0210A, the proposed realignment of SR 1349 (Airport Road) would intersect NC 84, Weddington Road at a new location approximately a half mile east of the existing intersection. The estimated total cost to extend the proposed widening of Weddington Road to this proposed new intersection is approximately $3,000,000 and is included in both alternatives.

Table A below shows the breakdown cost for the four-lane divided curb and gutter section only.

__ Section A - NC 84 between NC 16 and the point where NC 84 intersects with the proposed Rea Road Extension.

__ Section B - NC 84 and proposed Rea Road Extension runs concurrently to SR 1008.

__ Section C - NC 84 from SR 1008 to SR 1349 (Airport Road).

__ Section D - NC 84 between existing SR 1349 (Airport Road) and the proposed relocated SR 1349 (Airport Road).

__ Section E - The proposed Rea Road Extension between NC 16 and the point where Rea Road Extension intersects with NC 84.

TABLE "A"

SECTION		**BREAKDOWN COST**				
Length (Miles)		Construction	Right-of-Way	Utility Relocation	5-foot Sidewalk	TOTAL COST
A	1.96	$10,300,000	$4,200,000	$1,200,000	$500,000	$16,200,000
B	2.10	$11,700,000	$3,800,000	$1,400,000	$500,000	$17,400,000
C	2.74	$14,700.000	$3,000,000	$2,000,000	$700,000	$20,400,000
D	0.66	$2,000,000	$500,000	$400,000	$100,000	$3,000,000
E	1.56	$9,200,000	$3,800,000	$700,000	$400,000	$14,100,000

V. Community 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.

It should be noted that John Walker Mathews House, a landmark site on the Historic Study List Properties; is located within NC 16, south of NC 84 and approximately one-half mile from NC 84/NC 16 intersection. However, no direct impacts to this historic property are anticipated as a result of this project.

Bicycle accommodations are currently provided under all alternatives studied for this project.

VI. Natural Environment Issues

According to the National Heritage Program GIS database, there is one Threatened or Endangered Species that may potentially exist in the immediate project area. This species is a Fish (Etheostoma Collis).

VII. Recommendations

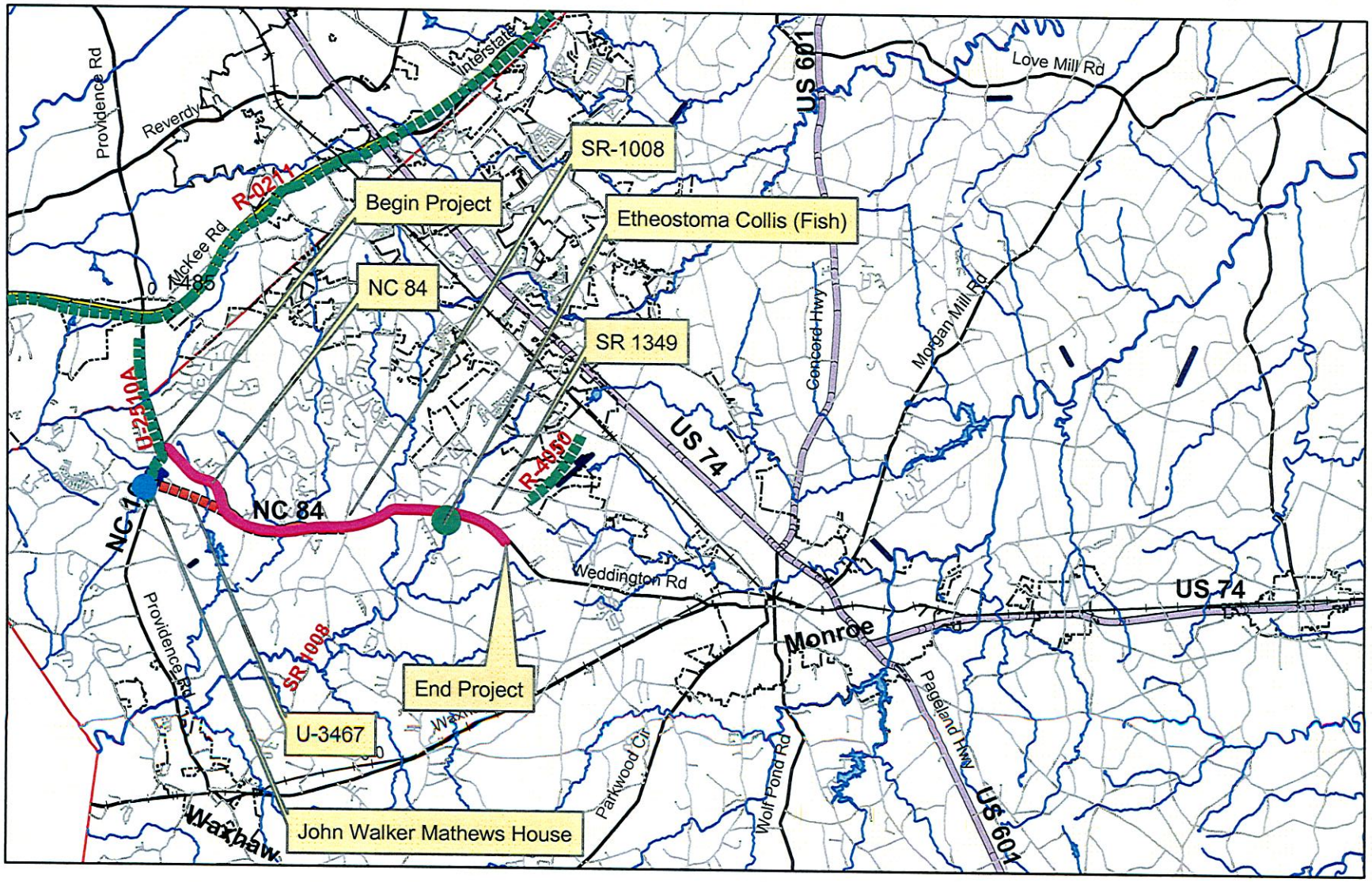
Both Alternatives evaluated in this project provide a multilane facility from NC 16 to SR 1349 (Airport Road). The locally preferred option is Alternative #2 which utilizes the Rea Road Extension currently proposed in TIP Project U-3467 from NC 16 to NC 84 instead of widening existing NC 84 from NC 16 to proposed Rea Road Extension intersection in Weddington. **However, the projected traffic volumes on this section of NC 84 indicates that multilane widening would still be needed at some point before the 2030 design year even with the Rea Road Extension in place.**

The estimated total costs of the locally preferred option (Alternative #2) is $54,900,000 including $11,100,000 for right-of-way, $4,500,000 for utility relocation and $39,300,000 for construction.

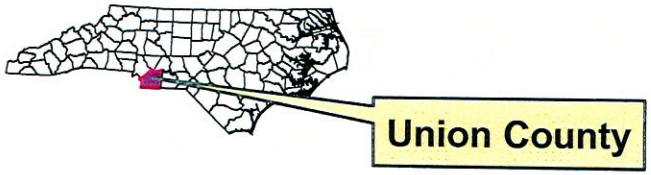
The updated total costs of TIP U-3467 (Rea Road Extension) from NC 16 to the NC 84/SR 1008 intersection is $31,500,000 including $7,600,000 for right-of-way, $2,100,000 for utility relocation and $21,800,000 for construction. This costs is for the proposed new location component (Section E) as well as the overlapping section of existing NC 84 (Section B), see the attached Figure 3.

FS-0310C

Figure 1



0 1.25 2.5 5 7.5 10 Miles



Proposed Project Limits

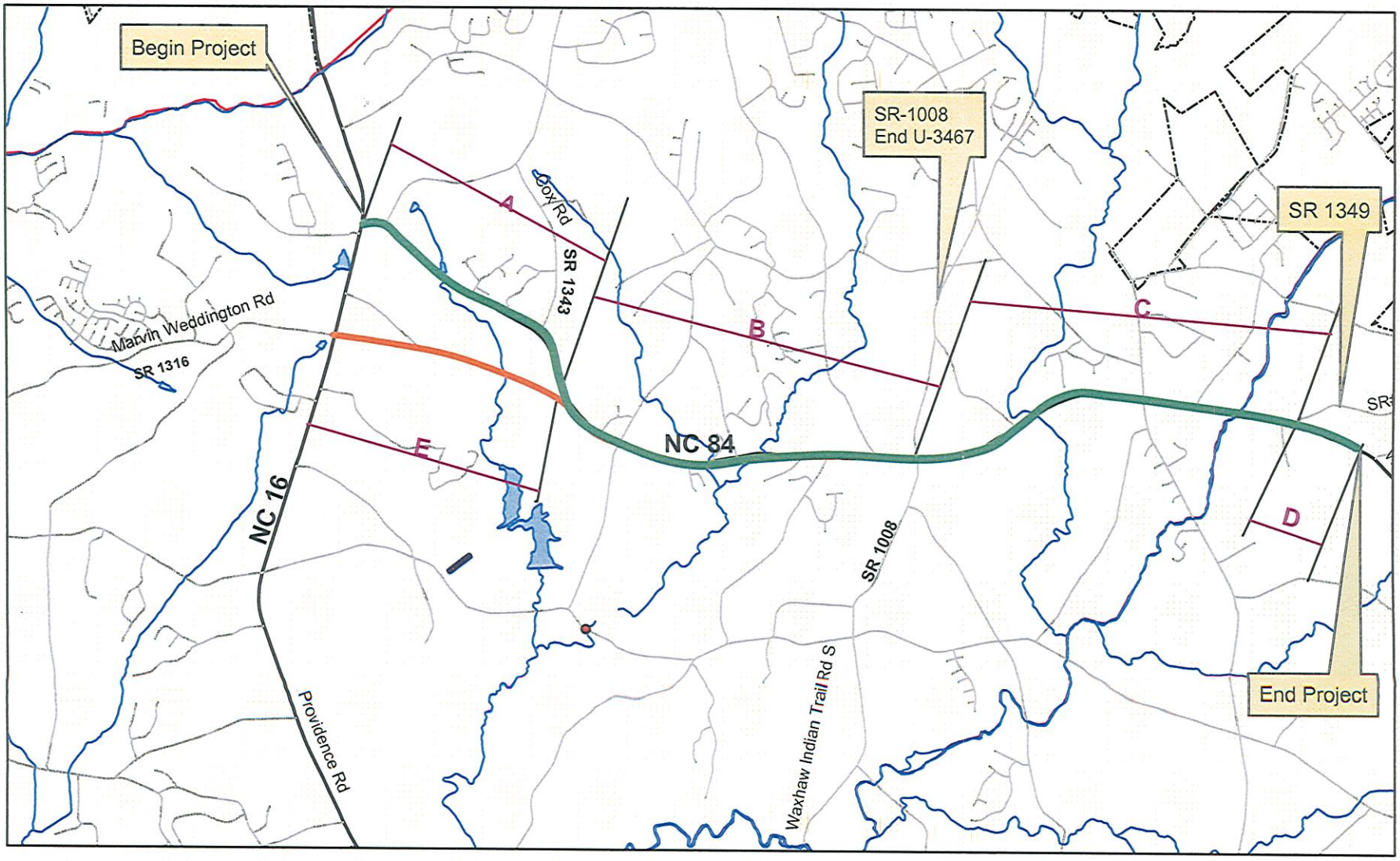
Current/Future Project

Proposed U-3467

N W E S

FS-0310C (Section Breakdown)

Figure 3



Union County

0 0.4 0.8 1.6 2.4 3.2 Miles

Proposed Project Limits (FS-0310C)

Proposed Rea Rd Ext.(U-3467)

Distances

A = 10,350+/- Feet

B = 11,100+/- Feet

C = 14,470+/- Feet

D = 3485+/- Feet

E = 8,240+/- Feet

N W E S

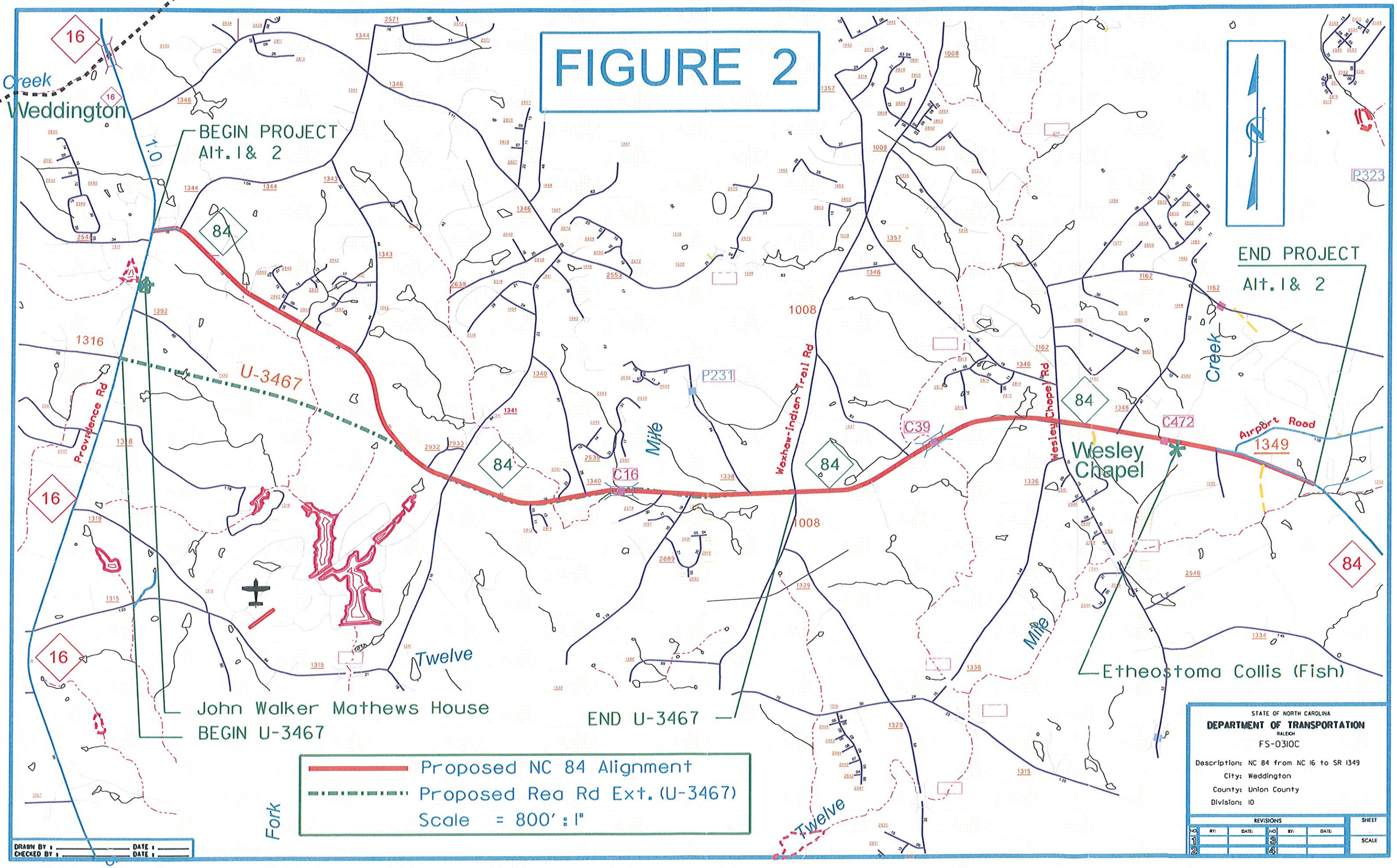


FIGURE 2
Creek
Weddington
BEGIN PROJECT
Alt. 1 & 2
END PROJECT
Alt. 1 & 2
U-3467
Providence Rd
Waxhaw-Indian Trail Rd
Wesley Chapel Rd
Airport Road
Wesley Chapel
Mile
Twelve
Fork
Creek
Mile
Twelve
Etheostoma Collis (Fish)
John Walker Mathews House
BEGIN U-3467
END U-3467
P231
P323
C16
C39
C472
1316
1008
1349
16
84
Proposed NC 84 Alignment
Proposed Rea Rd Ext. (U-3467)
Scale = 800' : 1"
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
FS-0310C
Description: NC 84 from NC 16 to SR 1349
City: Weddington
County: Union County
Division: 10
REVISIONS
SHEET
SCALE
DRAWN BY :
CHECKED BY :
DATE :
DATE :