FEASIBILITY STUDY

FS-0213A

Widening NC 112 (Sardis Road/Sand Hill Road) From NC 191 (Brevard Road) To US 19-23 (Smokey Park Hwy)

Buncombe County

Division 13

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

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Date

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I. General Description

This feasibility study describes roadway improvements along NC 112 (Sardis Road/Sand Hill Road) from NC 191 (Brevard Road) to US 19-23 Smokey Park Highway. This portion of the roadway is 3.62 miles. The project location is shown on Figures 1 and 2. As part of this study, two different alternatives were investigated and are described below:

ALTERNATE 1. Four-lane divided curb and gutter section with a narrow 23-foot raised grass median on 120 feet right-of-way.

ALTERNATE 2. Five-lane curb and gutter section on 120 feet of right-of-way.

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 safety and operations as well as improved access to the surrounding community. Currently a moving ahead project is underway along NC 112 (Sand Hill Rd) between SR 3446 and SR 3412. This improvement is the widening of NC 112 (Sand Hill Rd) from the existing two-lane shoulder section to a three-lane curb and gutter section.

In the North Carolina Urban Functional Classification System, NC 112 (Sardis Rd/Sand Hill Rd) is designated as minor arterial between US 19-23 and NC 191.

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

There are two TIP projects in the area that proposes to upgrade US 19-23 and NC 191 at the west and east ends of the project respectively. These projects are described below:

- R-4406, NC 215 in Canton to multi-lanes near NC 151, widen to multi-lanes (Coordinate with B-3656), Buncombe-Haywood Counties.

- U-3403, NC 191 (Brevard Road-Old Haywood Road) NC 280 to NC 112 (Sardis Road), widen to multi-lanes, Buncombe-Henderson Counties.

There are three structures located along the project route; two bridges and one double reinforced concrete box culvert (RCBC), they are described as follows:

1. Structure #40 is 76.6 feet wide, out to out. This structure is located approximately 0.5 mile north of Enka Village and carries NC 112 over Southern Railroad. The total length of this structure is 72 feet with a 64 feet horizontal clearance. It was constructed in 1936 and has a sufficiency rating of 68.4 points.

2. Structure #85 is 31 feet wide, out to out and located approximately 0.25 mile north of Enka Village, it carries NC 112 over Hominy Creek. The total length of the existing structure was 112 feet with a 24 feet horizontal clearance. Structure #85 was originally constructed in 1929. However, this Structure is currently under construction under TIP project B-4033 and is expected to be completed in November 2010.

3. A double reinforced concrete box culvert (RCBC) is located approximately 0.5 mile north of NC 191 and carries NC 112 over Pond Branch. The total length of this structure is about 32 feet with a 24 feet horizontal clearance.

III. Traffic and Safety

The current year Average Daily Traffic (ADT) within the project limits ranges from 15,600 vehicles per day (vpd) at the east end to 17,100 vpd at the west end. For the design year 2035 build scenario, the estimated traffic volumes within the project limits ranges from 27,000 vehicles per day (vpd) at the east end of the project to 30,100 vpd at the west end. Truck traffic is estimated to make up 3% of the ADT traffic.

During the three-year period from January 2006 through December 2008, there were 206 accidents reported within the project limits. 123 of these crashes were property damage only accidents, 82 were injury crashes with one (1) fatality as a result of these accidents. The accident rate for this 4.32 mile portion of roadway was 311.06 accidents per 100 million vehicle miles of travel (acc/100mvm), which was slightly higher than the 2006-2008 statewide rate of 303.18 accidents/100 mvm for two-lane undivided primary routes.

The most prevalent accident types along this corridor are as follows: approximately 61 percent of accidents were rear end, slow or stop, 3 percent were with left turn, 8 percent were angle accidents and 5 percent were fixed object accidents. Individually, all other accident types are approximately twenty-three (23) percent or less of total accidents. Improvements to upgrade this section of roadway to a multilane facility should reduce the likelihood some of these types of accidents.

There are six existing signals within the project limits. They are located at US 19-23 (Smokey Park Hwy), SR 3446 (Enka Lake Road), SR 3437 (Lake Drive), Jacob Holm Way, SR 3412 (Sand Hill Road) and at the intersection of NC 191/SR 3624 (Brevard Road/Ridgefield Blvd).

All intersections along NC 112 are currently operating at a Level of Service (LOS) "C" or better, except the intersection at NC 112/SR 1234 and US 19-23 which is operating at a LOS "F" and the intersection at NC 191 and NC 112/SR 3624 also, operating at LOS "D". If no improvements are made along existing NC 112 prior to the design year 2035, then all intersections will operate at a LOS "F".

However, with the proposed widening of NC 112, the facility is anticipated to operate at a LOS "D" or better in design year (DY) 2035, with the exception of the intersection at NC 191/SR 3624. This intersection is expected to operate at a LOS "E", unless additional improvements well beyond the scope of this project are provided.

The construction cost estimate shown below for each alternative include the installation of a five (5) foot sidewalk, on both sides of the road beginning at US 19-23 and ending at NC 191. This sidewalk is estimated to cost an additional $550,000 per side.

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 120 feet proposed right-of-way. The proposed widening is symmetrical along existing NC 112 for the entire length of the project. The length of the alternative is approximately 3.62 miles.

With this alternative, six (6) residences relocation and eighteen (18) business relocations are expected. The total cost of the alternative, including construction, utility relocation and right-of-way is estimated to be $43,692,000.

Construction	$23,400,000
Right-of-Way	$16,800,000
Utility Relocation	$3,492,000
Total Project Cost (Alternative #1)	$43,692,000

ALTERNATE 2. Construct five-lane curb and gutter sections, 68 feet wide face to face of curbs with 15-foot berms on 120 feet of right-of-way. Also, the proposed widening is symmetrical along existing NC 112 for the entire length of the project. The length of this alternative is approximately 3.62 miles.

With this alternative, six (6) residences relocation and eighteen (18) business relocations are expected. The total cost of the alternative, including construction, utility relocation and right-of-way is estimated to be $39,592,000.

Construction	$19,300,000
Right-of-Way	$16,800,000
Utility Relocation	$3,492,000
Total Project Cost (Alternative #2)	$39,592,000

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.

At approximately ¼ mile east of Sand Hill Road, a State owned property that houses the Department of Environmental and Natural Resources (FR D-1 Headquarters) is located along the project corridor, impacts to this structure is not anticipated.

The French Broad River MPO as well as the City of Asheville has requested that bicycle accommodations be provided under this project. Both alternatives in this study include 14 feet wide outside lanes to accommodate bicycles.

VI. Natural Environment Issues

According to existing GIS databases, there is one Air Quality Pollution Discharge Point (BASF Corporation) located approximately 200 feet east of SR 3437.

VII. Recommendations

It is recommended to improve NC 112 (Sardis Road/Sand Hill Road)to a multi-lane, curb and gutter facility between US 19-23 (Smokey Park Hwy) and NC 191 (Brevard Road).

The analyses for the four-lane divided, narrow median sections and the five-lane sections indicated that either of these alternatives would accommodate the projected 2035 design year volumes with an acceptable level of service. The cost difference between the two options is $3.0 million, in favour of the five-lane section. However, five-lane sections tend to promote strip development and indiscriminate left turn movements, while four-lane divided narrow median sections minimize strip development, prevent indiscriminate left turn movements and allow pedestrian refuge if needed. Therefore, due to these factors, the four-lane divided cross-sections (Alternative #1) is preferred over the five-lane alternative.

The total cost of the alternative #1 is $43,692,000 with $16,800,000 for right-of-way, $3,492,000 for utility relocation and $23,400,000 for construction.

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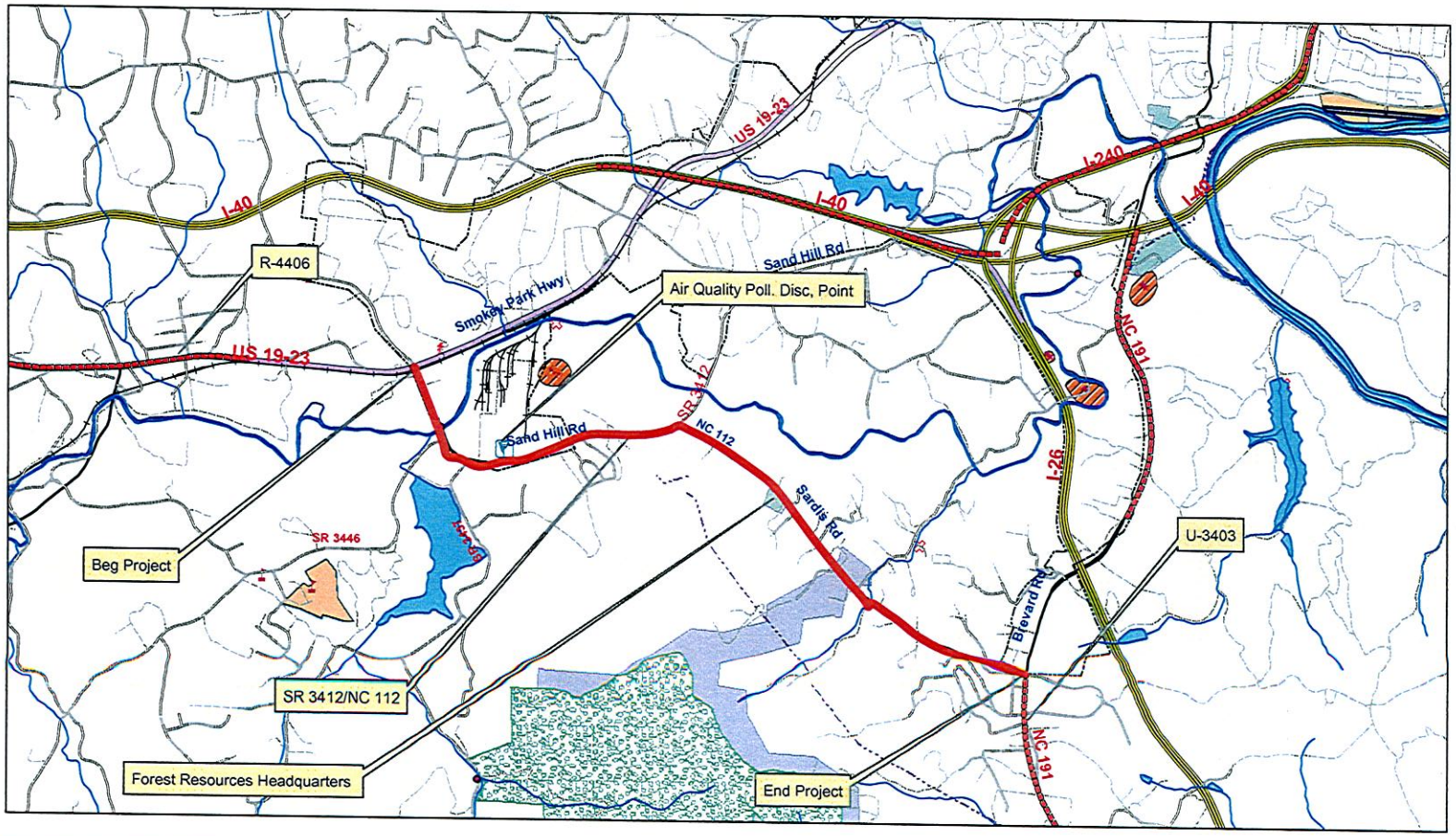
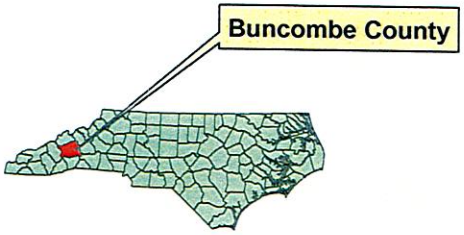
Figure 1





0 0.5 1 2 Miles

Project Limits

TIP Projects (U-3403 & R-4406)

N W E S

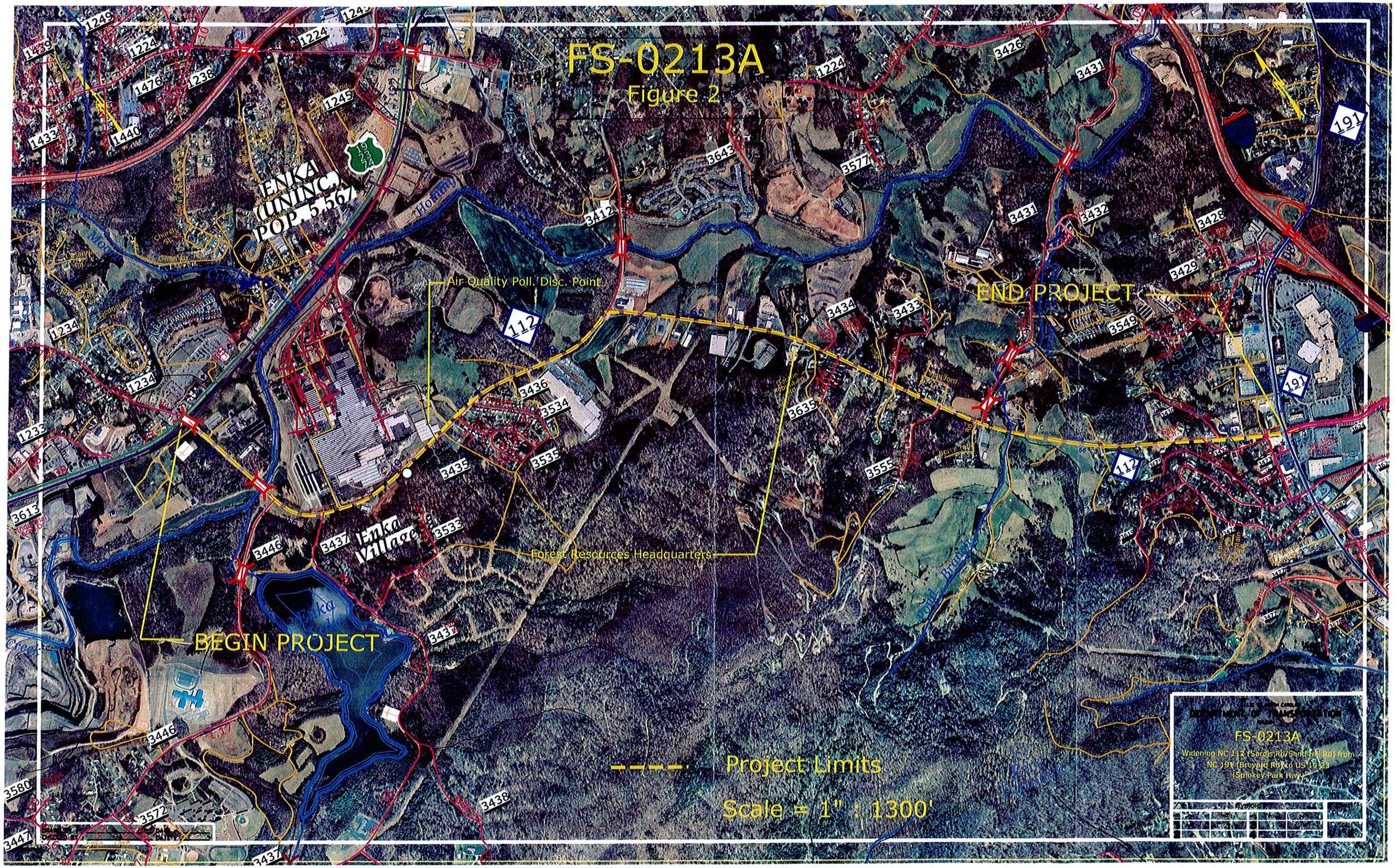

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Figure 2
ENKA (UNINC) POP. 5,567
Air Quality Poll. Disc. Point
END PROJECT
BEGIN PROJECT
Forest Resources Headquarters
Enka Village
Project Limits
Scale = 1" : 1300'
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