

FEASIBILITY STUDY

Town of Sparta

**Improvements to NC 18 (Whitehead St.) at the intersections of
SR 1403 (Grayson St.) and SR 1419 (Napco Road).**

Alleghany County

Division 11

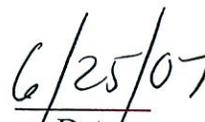
FS-0211A



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I. General Description

This feasibility study describes the operation and safety improvements to NC 18 at the intersections of SR 1403 (Grayson St.) and SR 1419 (Napco Rd.). The project location is shown on Figure 1, and the details of each intersection are as follows:

- NC 18/SR 1403 intersection - the improvements in this report include minor realignment of both NC 18 and SR 1403 in order to widen the narrow lanes, improve intersection sight distance, provide auxiliary turn lanes, and minimize impacts to a potential historic structure.
- NC 18/SR 1419 intersection - the improvements in this report include widening NC 18 to provide improved lane widths, intersection sight distance and an auxiliary turn lane on NC 18.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including costs, and to identify potential problems that may require consideration in the planning and design phases.

II. Background

The purpose of this project is to improve the traffic safety and operations of the NC 18 intersections with SR 1403 and SR 1419 by addressing geometric concerns. These concerns may include, but are not limited to; intersection sight distance, narrow lane widths and the lack of auxiliary turn lanes. Although capacity is not a concern for the existing conditions, the following geometric concerns may pose potential problems at the following intersections:

- NC 18 and SR 1403 intersection:
 - a) A retaining wall located in the northwestern quadrant poses a sight obstruction.
 - b) There is a potential historic structure located in the northwestern quadrant.
 - c) There is a building located in the southeastern quadrant, which poses a sight obstruction.
 - d) NC 18 and SR 1403 both have sub-standard lane widths.

- e) Horizontal alignment needs to be adjusted due to substandard curvature.
 - f) Curb and gutter is limited to northwestern quadrant.
 - g) Uncontrolled paved frontage used for parking in the southwestern and southeastern quadrants.
- NC 18 and SR 1419 intersection:
 - a) There is a back slope and vegetation sight distance obstruction in the northwestern quadrant.
 - b) Substandard lane widths exist on both NC 18 and SR 1419, posing significant problems to the heavy truck traffic in this area.

The Alleghany County Board of Commissioners and the Town of Sparta support this project.

NC 18 (Whitehead Street) is designated as a major thoroughfare in the Sparta/Alleghany Municipal Urban Area Thoroughfare Plan and as a "Major Collector" in the North Carolina State Rural Functional Classification System.

NC 18 is a two-lane shoulder section with varying road widths, with the exception of the portion from US 21 (Main Street) to SR 1403 (Grayson Street), which consists of a three-lane section with curb, gutter and sidewalk on the northern side and minimal shoulder on the other.

The development within this study is primarily a mixture of business, commercial and retail businesses with some residential housing.

The original study included two additional intersections; NC 18 at SR 1138 (Osborne Road) and NC 18 at SR 1136 (Reynolds Rd.). However, these intersections are being addressed by Division 11 Moving Ahead projects and will not be addressed in this feasibility study.

III. Traffic and Safety

The current year (2007) Average Daily Traffic (ADT) at the NC 18 (Whitehead Street) and SR 1403 (Grayson Road) intersection is 5,600 vpd and the ADT for SR 1403 is 2,200 vpd. For the design year 2035, the estimated traffic volumes on NC 18 are projected to be as high as 9,300 vpd and SR 1403 will have up to 3,700 vpd. Truck traffic is estimated to make up approximately seven (7) percent of daily traffic on NC 18 and three (3) percent of the daily traffic on SR 1403.

The current year ADT along NC 18 at SR 1419 (Napco Road) is 4,000 vpd and the ADT for SR 1419 is 700 vpd at this intersection. For the design year 2035, the estimated traffic volumes on NC 18 will be 6,700 vpd and the ADT for SR 1419 is projected to increase to 1,100 vpd. Truck traffic is estimated to make up approximately seven (7) percent of daily traffic on NC 18 and eleven (11) percent of daily traffic on SR 1419.

Currently, both intersections are operating at Level of Service (LOS) B and will remain at this level of service through the 2035 design year.

Currently there are no traffic signals located at either intersection, however, during the initial design phase a signal could be warranted at the SR 1403 and NC 18 intersection.

During the three-year period from January 1, 2004 to December 31, 2006, four (4) accidents were reported within the NC 18 /SR 1403 intersection project limits. The accident rate for this intersection is 77.65 accidents per 100 million vehicle miles of travel (acc/100mvm) versus the statewide rate of 191.04 acc/100mvm for rural NC 2-lane undivided routes. One (1) accident was reported within the NC 18 /SR 1419 intersection project limits. The accident rate for this intersection is 22.81 accidents per 100 million vehicle miles of travel (acc/100mvm). During this period, there were zero (0) fatalities, and two (2) property damage only crashes.

IV. Description of Improvements

NC 18/SR 1403 Intersection (See Figure 2).

NC 18 is realigned to the southwest in order to improve the intersection sight distance and lane widths, provide auxiliary turn lanes and improve horizontal alignment, while minimizing the impacts on a potential historic structure in the northwestern quadrant. On the southwestern approach, upgrade the existing section to a three-lane curb and gutter section, 40-foot face to face of curbs. The northeast approach is widened to a four-lane curb and gutter section, 52-foot face to face of curbs, before transitioning back to the existing two-lane shoulder section. All improvements are contained within a proposed 100-foot of right-of-way.

SR 1403 is realigned to the northeast in order to improve the intersection sight distance, and provide auxiliary turn lanes while minimizing the impacts on a potential historic structure in the northwestern quadrant. On the northwest SR 1403 approach, transition the existing two-lane section to a four-lane curb and gutter section, 52-foot face to face of curbs at the intersection in order to provide an exclusive left and right turn-lane. On the southeast SR 1403 approach, transition the existing two-lane section to a three-lane curb and gutter section, 40-foot face to face of curbs at the intersection in order to provide an exclusive left turn-lane. All improvements are contained within a proposed 100-foot right-of-way. The intersection estimate also includes 5' sidewalks on both sides of all approaches within the construction limits, totaling approximately 1500'.

Under the recommended improvements to this intersection, it is anticipated there will be zero (0) residential and five (5) business relocatees. The total cost of this alternative is estimated to be \$4,500,000.

Construction	\$1,300,000
<u>Right-of-Way & Utilities</u>	<u>\$3,200,000</u>
Estimated Project Cost	\$4,500,000

NC 18/SR 1419 Intersection (See Figure 3)

In order to improve the intersection sight distance and provide an auxiliary left turn lane to accommodate the high percentage of trucks bound for SR 1419, the existing two-lane shoulder section on NC 18 is widened symmetrically about the existing centerline as it approaches SR 1419. The recommended pavement width at the intersection is 44-foot edge to edge of pavement and includes 12-foot travel lanes and 4-foot paved shoulders on each side, within 100-foot of a symmetrical right-of-way.

No additional lanes are recommended for SR 1419 at this time. However, the cost of upgrading the existing narrow two-lane section to a 32-foot section, edge to edge of pavement in the intersection influence area is included below. The recommended right-of-way for this improvement is 100-foot symmetrical about the centerline

With the above-mentioned improvements, it is anticipated there will be zero (0) residential and zero (0) business relocatees. The total cost of this alternative is estimated to be \$800,000.

Construction	\$700,000
Right-of-Way & Utilities	\$100,000
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Estimated Project Cost	\$800,000

The total cost of the intersection improvements contained in this feasibility study is \$5,300,000, including 5' sidewalks at the SR 1403 intersection. It should be noted that the improvements contained in this study are based on limited data and represent a worse case scenario for impacts. During later planning and design phases of the project development, a best-fit solution, which may reduce the cost and impacts, can be investigated as additional information is made available.

V. Community Issues

A detailed investigation was not conducted for this feasibility study. However no impacts to parks, recreation areas, or community facilities are anticipated with this project.

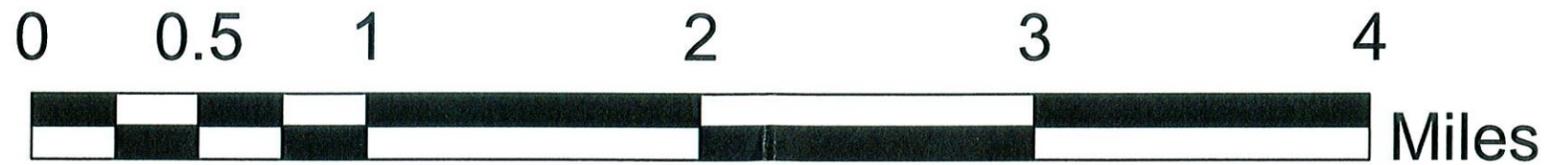
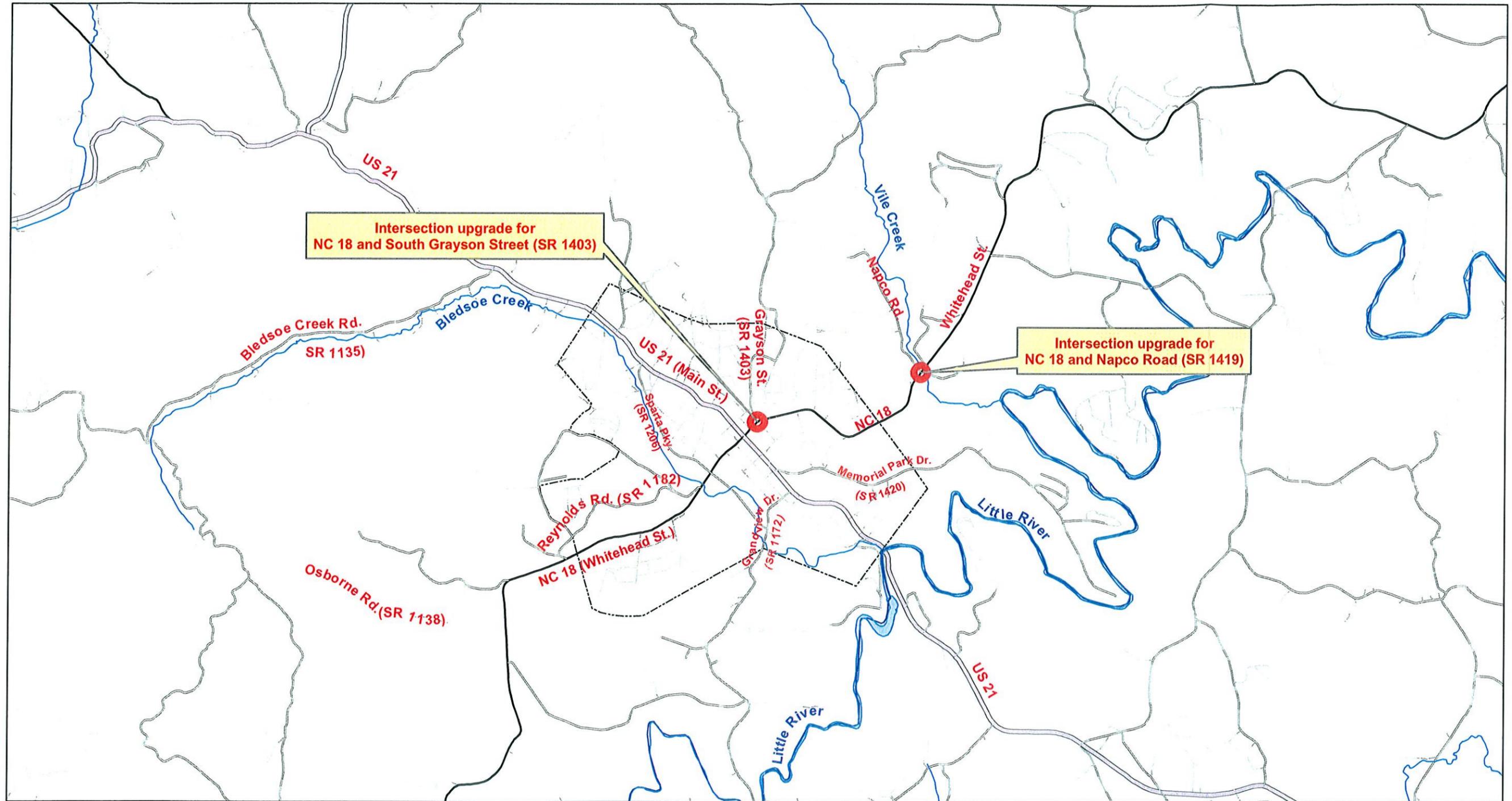
VI. Natural and Environmental Issues

A detailed environmental study was not conducted for this feasibility study.

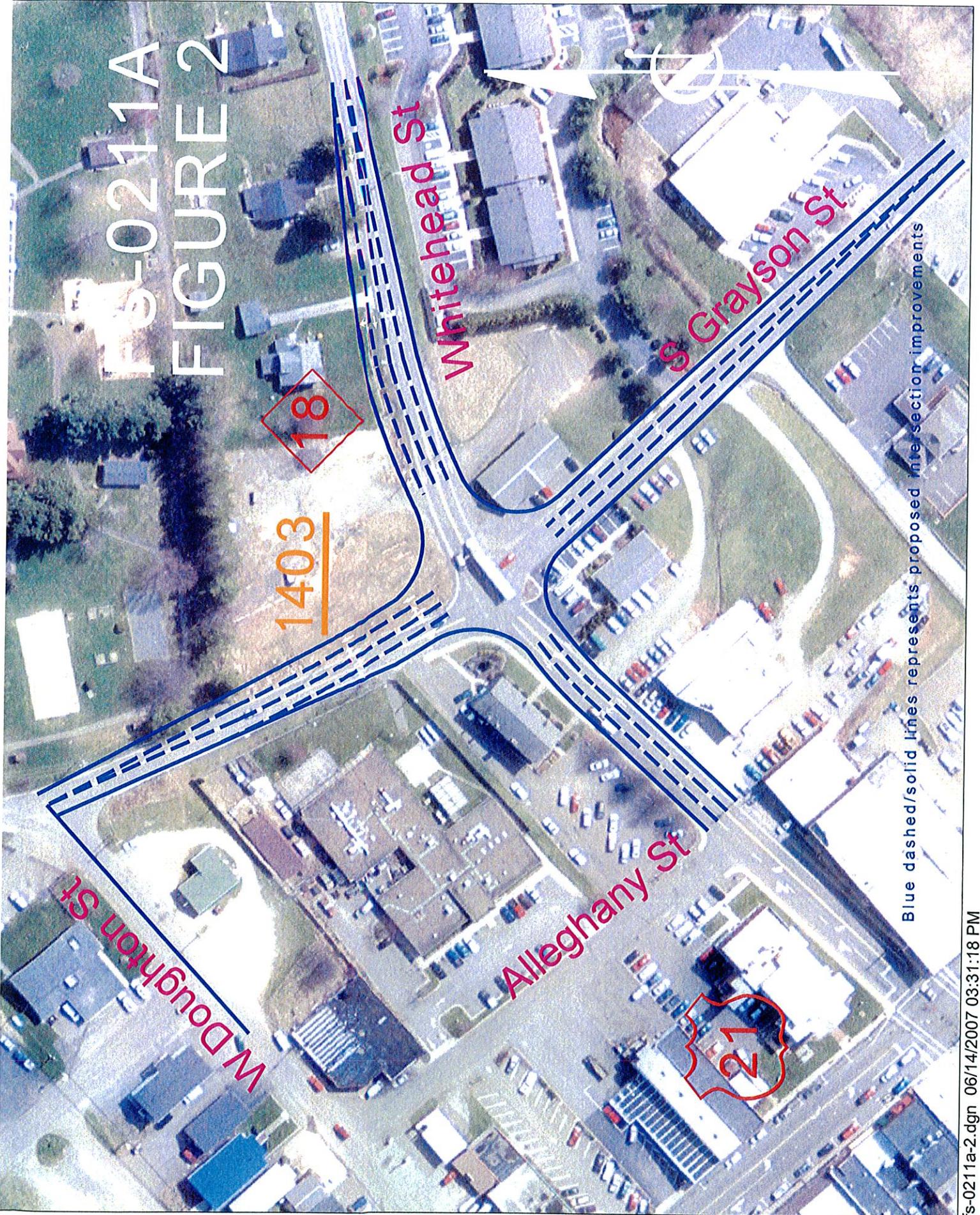
However, existing information available for this project area has been screened for environmental and historic issues that might have a potential impact to the project. The information obtained for the environmental screening is from a Geographic Information System (GIS) database.

There is one potential historical structure, Alleghany County Community Bldg./Senior Citizens Center with a 1940 Plaque on it located at 85 East Whitehead Street (NC 18). While the improvements contained within this report attempt to minimize the impacts on this structure, it will require further investigation during the later planning and design phases.

FIGURE 1
FS - 0211A
Town of Sparta / Alleghany County



FS-0211A FIGURE 2



Blue dashed/solid lines represents proposed intersection improvements

