

**FEASIBILITY STUDY**

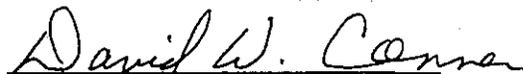
**Banner Elk**

**West Main Street (NC 184-NC 194)  
from Beech Mountain Road (NC 184)  
to Shawneehaw Avenue (NC 184)  
Avery County**

**R-3604**

**Division 11**

Prepared by  
Program Development Branch  
Division of Highways  
N. C. Department of Transportation



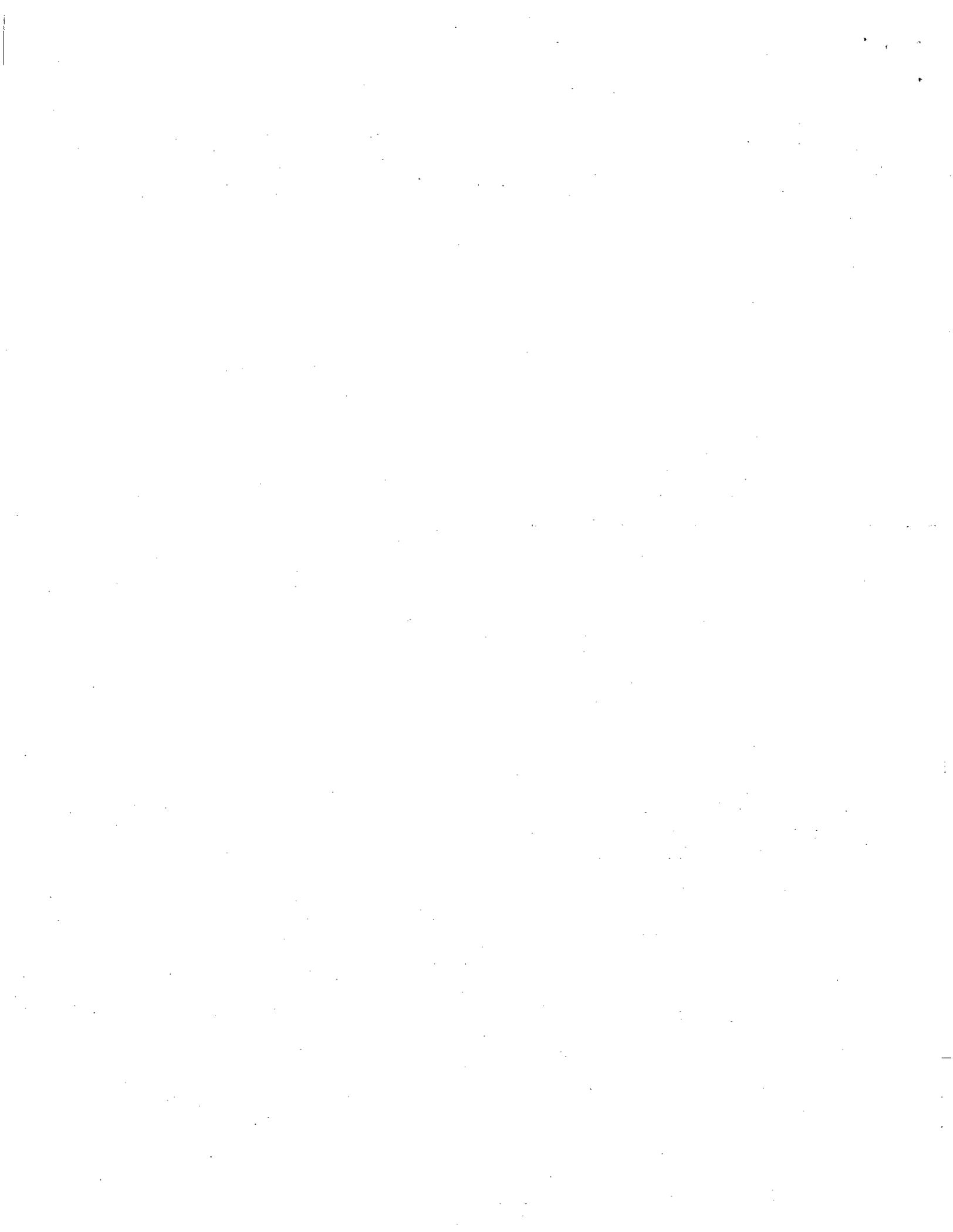
David W. Conner  
Highway Planning Engineer



David G. Modlin, Jr., Ph.D., P.E.  
Head of Feasibility Studies

3/4/97

Date



Banner Elk

West Main Street (NC 184-NC 194)  
From Beech Mountain Road (NC 184)  
To Shawneehaw Avenue (NC 184)

Avery County

R-3604

**I. General Description of Alternates**

This is a feasibility study describing two alternates for widening West Main Street (NC 184-NC 194) in Banner Elk. It is recommended that West Main Street be widened from Beech Mountain Road (NC 184) to Shawneehaw Avenue (NC 184), a distance of approximately 0.5 miles (0.8 km). The location of the study area and is shown on the attached Figure 1. The studied alternates are described below and shown on Figure 2.

Alternate 1

Widen West Main Street to a 4-lane, 56-foot (17.1-m) wide (face-to-face), curb-and-gutter section, with 10-foot (3.0-m) wide berms. This cross section includes 2 travel lanes in each direction with 12-foot (3.6-m) wide inside lanes, and 14-foot (4.2-m) wide outside lanes. A right-of-way width of 80 feet (24.4 m) is suggested.

It is estimated that there will be 2 residences and 2 businesses relocated as a result of this alternate.

The total cost of right-of-way and construction of Alternate 1 is estimated to be \$3,200,000 as follows:

Right-of-way	\$1,900,000
Construction	1,300,000
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Total Cost	\$3,200,000

Alternate 2

Widen West Main Street to a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter section, with 10-foot (3.0-m) wide berms. This cross section includes 2 travel lanes in each direction with 12-foot (3.6-m) wide inside lanes, and 14-foot (4.2-m) wide outside lanes, and a 12-foot (3.6-m) wide turn lane. A right-of-way width of 100 feet (30.5 m) is suggested.

It is estimated that there will be 3 residences and 5 businesses relocated as a result of this alternate.

The total cost of right-of-way and construction of Alternate 2 is estimated to be \$4,250,000 as follows:

Right-of-way	\$2,550,000
Construction	1,700,000
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Total Cost	\$4,250,000

Alternate 2 (5-lane, curb-and-gutter) is recommended for implementation. Although Alternate 2 is more expensive, it is the recommended alternate because with Lees McRae College located on the south side of the roadway and extensive parking facilities located on the north side of the roadway the inside travel lanes of a 4-lane, undivided section could primarily become left-turn lanes.

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. Existing Conditions

The purpose of this project is to improve the traffic carrying capacity of West Main Street and to relieve traffic congestion around Lees McRae College.

West Main Street is designated a major thoroughfare on the Banner Elk Thoroughfare Plan and a major collector on the North Carolina Statewide Functional Classification System.

Existing West Main Street is a 2-lane rural shoulder section with a 20-foot (6.1-m) wide pavement and soil shoulders. It is developed with dense commercial development around the Shawneehaw Avenue intersection and Lees McRae College is located immediately west of the intersection. The college buildings and grounds encompass the west side of the roadway for most of the project length and parking facilities comprise the development on the east side of the roadway. The roadway is moderately developed around the Beech Mountain Road intersection with a motel and retail establishments.

At the east project terminus, Shawneehaw Avenue is a 2-lane roadway which creates a T intersection with West Main Street from the south. The intersection is signalized. This section of roadway is recommended for widening to a 5-lane curb-and-gutter section as part of project R-2811 and is included in the 1996 Transportation Improvement Program as an "Identified Future Need".

At the west project terminus, Beech Mountain Road is a 2-lane, rural shoulder section which creates a T intersection with West Main Street from the north. The intersection is stop sign controlled and traffic is channelized with traffic islands.

Within the project termini, the 1996 Average Daily Traffic (ADT) on West Main Street is estimated to vary from approximately 5,200 vehicles per day (vpd), near the western project terminus to approximately 8,400 vpd, near the eastern project terminus. The estimated design year (2020) volumes are 11,000 vpd 14,800 vpd, respectively.

It is estimated that, within the project termini, the roadway is currently operating at a Level Of Service (LOS) E. With construction of either of the studied alternates, the LOS is expected to improve to a Level A which should prevail through the design year (2020). Without improvements it is estimated that a Level F will be reached prior to the design year.

During the period from March 1, 1993, through February 29, 1996, there were 22 accidents reported on West Main Street between the project termini. This resulted in an accident rate of 266.4 accidents per 100 million vehicle miles (Acc/100 MVM), compared to a statewide average of 317.2 Acc/100 MVM for all urban NC routes during 1994. The most prevalent accident types were rear-end (27.3%) and left-turn (18.1%). The studied cross sections will reduce the potential for these types of accidents.

### III. Detailed Description of Alternates

Two alternates were studied for widening West Main Street (NC 184-NC 194) in Banner Elk. The location of the alternates are depicted on the attached Figure 1 and a detailed description of the alternates is as follows:

#### Alternate 1

Widen West Main Street, from Beech Mountain Road (NC 184) to Shawneehaw Avenue (NC 184), to a 4-lane, 56-foot (17.1-m) wide (face-to-face), curb-and-gutter section, with 10-foot (3.0-m) wide berms. This cross section includes 2 travel lanes in each direction with 12-foot (3.6-m) wide inside lanes, and 14-foot (4.2-m) wide outside lanes. A right-of-way width of 80 feet (24.4 m) is suggested.

At Beech Mountain Road, the westbound approach should include a right-turn lane onto Beech Mountain Road and one lane continuing westbound. Eastbound traffic should be channelized from one to two lanes through the use of islands. See Figure 2 for the suggested terminus configuration.

At Shawneehaw Avenue, the eastbound approach should include a right-turn lane onto Shawneehaw Avenue and one lane continuing eastbound. Westbound traffic should be channelized from one westbound lane (east of the intersection) to two westbound lanes and a left-turn lane. The traffic signal at the intersection should be upgraded. See Figure 2 for the suggested terminus configuration.

It is estimated that there will be 2 residences and 2 businesses relocated as a result of this alternate.

The total cost of right-of-way and construction of Alternate 1 is estimated to be \$3,200,000 as follows:

Right-of-way	\$1,900,000
Construction	1,300,000
-----	-----
Total Cost	\$3,200,000

#### Alternate 2

Widen West Main Street, from Beech Mountain Road (NC 184) to Shawneehaw Avenue (NC 184), to a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter

section, with 10-foot (3.0-m) wide berms. This cross section includes 2 travel lanes in each direction with 12-foot (3.6-m) wide inside lanes, and 14-foot (4.2-m) wide outside lanes, and a 12-foot (3.6-m) wide turn lane. A right-of-way width of 100 feet (30.5 m) is suggested.

At Beech Mountain Road, the westbound approach should include a right-turn lane onto Beech Mountain Road and one lane continuing westbound. Eastbound traffic should be channelized from one to two lanes through the use of islands. See Figure 2 for the suggested terminus configuration.

At Shawneehaw Avenue, the eastbound approach should include a right-turn lane onto Shawneehaw Avenue and one lane continuing eastbound. Westbound traffic should be channelized from one westbound lane (east of the intersection) to two westbound lanes. The traffic signal at the intersection should be upgraded. See Figure 2 for the suggested terminus configuration.

It is estimated that there will be 3 residences and 5 businesses relocated as a result of this alternate.

The total cost of right-of-way and construction of Alternate 2 is estimated to be \$4,250,000 as follows:

Right-of-way	\$2,550,000
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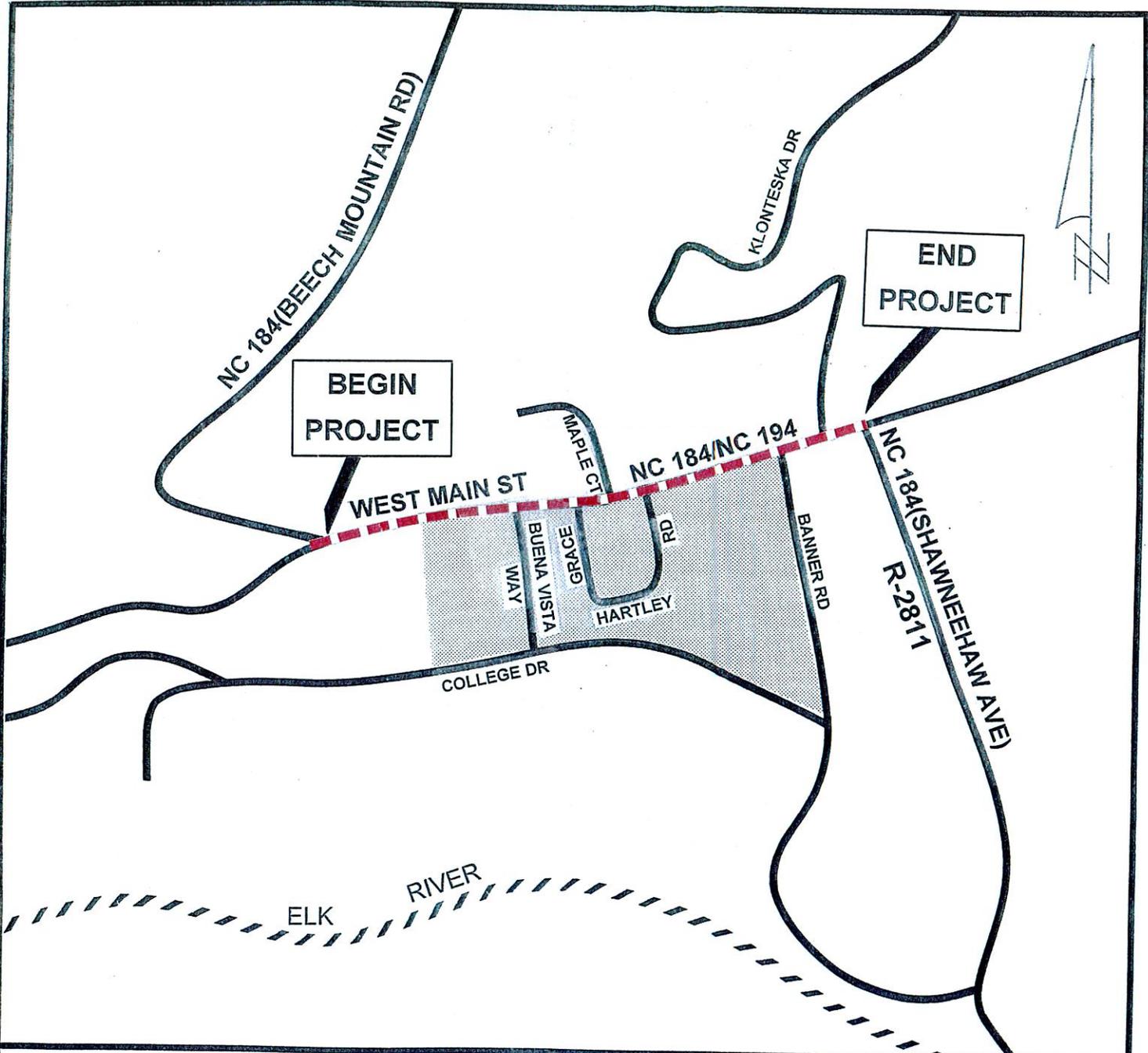
#### IV. Other Comments

An environmental screening was not conducted for this study; however, no impacts to historic properties or wetlands are anticipated.

Based on maps available at the Department of Environment, Health, and Natural Resources - Natural Heritage Section, no threatened or endangered species were identified in the project corridor.

The NC DOT Office of Bicycle and Pedestrian Transportation has identified this project as having a need for bicycle accommodations. Therefore, the alternates studied include 14-foot (4.2-m) wide outside lanes.

The inclusion of sidewalks have been requested, by the Town of Banner Elk. The costs of sidewalks are not included in the costs of the alternates described above; however, it is estimated that sidewalks could be included, for the full project length, for approximately \$100,000.



**END PROJECT**

**BEGIN PROJECT**

Lees McRae College

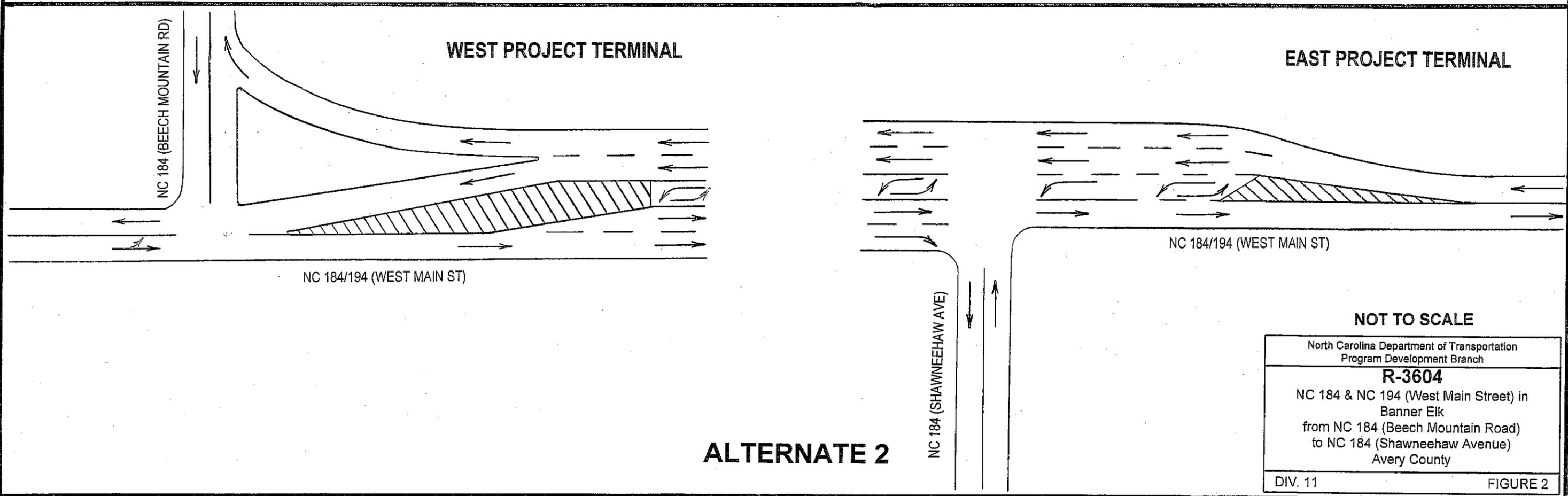
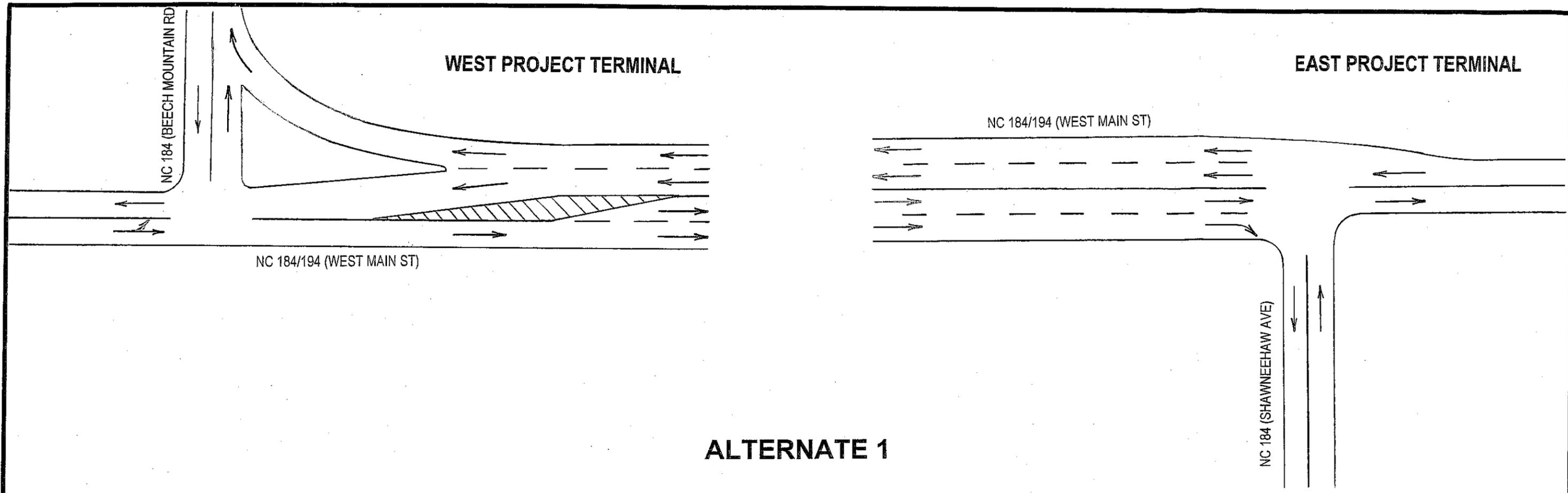


**NOT TO SCALE**

North Carolina Department of Transportation  
 Program Development Branch

**R-3604**  
 NC 184 & NC 194 ( West Main Street ) in  
 Banner Elk  
 from NC 184 (Beech Mountain Road) to  
 NC 184 (Shawnee Haw Avenue)  
 Avery County

DIV. 11 FIGURE 1



**NOT TO SCALE**

North Carolina Department of Transportation  
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NC 184 & NC 194 (West Main Street) in  
Banner Elk  
from NC 184 (Beech Mountain Road)  
to NC 184 (ShawneeHaw Avenue)  
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DIV. 11 FIGURE 2