

## **1999 PURPOSE & NEED**

This statement was prepared in 1999. It will appear in the Draft Environmental Impact Statement as chapter 1. It uses the latest traffic forecasts and accident statistics available. As a part of the NCDOT's agreement with the US Army Corps of Engineers to combine the impact assessment processes of the National Environmental Policy Act and the Clean Water Act, representatives of the NCDOT and the Federal Highway Administration met with representatives of the Corps of Engineers. The Corps of Engineers concurred that this statement of purpose and need adequately defined the needs to be met by the US 321 improvements project.

### **PURPOSE AND NEED REPORT for ADMINISTRATIVE ACTION ENVIRONMENTAL DOCUMENT**

**Proposed US 321 Improvements at Blowing Rock  
Town of Blowing Rock  
Watauga and Caldwell Counties**

TIP No, R-2237C  
State Project Number 8.T731301

**US DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION AND THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**

Cooperating Agencies  
US Army Corps of Engineers

November 4, 1999

## Table of Contents

1.	<a href="#"><u>PURPOSE AND NEED FOR ACTION</u></a>
1.1	<a href="#"><u>INTRODUCTION</u></a>
1.2	<a href="#"><u>PROJECT NEED</u></a>
1.3	<a href="#"><u>PROJECT PURPOSE</u></a>
1.4	<a href="#"><u>BACKGROUND INFORMATION</u></a>
1.4.1	<a href="#"><u>Setting and Land Use</u></a>
1.4.2	<a href="#"><u>Population Growth</u></a>
1.4.3	<a href="#"><u>Project History</u></a>
1.5	<a href="#"><u>THOROUGHFARE PLANNING</u></a>
1.5.1	<a href="#"><u>Overview of the Thoroughfare Planning Process</u></a>
1.5.2	<a href="#"><u>Caldwell and Watauga County Thoroughfare Planning</u></a>
1.5.3	<a href="#"><u>North Carolina Transportation Improvement Program</u></a>
1.6	<a href="#"><u>TRANSPORTATION NETWORK AND OPERATING CHARACTERISTICS</u></a>
1.6.1	<a href="#"><u>Existing Road Network</u></a>
1.6.2	<a href="#"><u>Roadway Characteristics and Posted Speeds</u></a>
1.6.3	<a href="#"><u>Sidewalks and Pedestrian Movements</u></a>
1.6.4	<a href="#"><u>Intersections and Access Control</u></a>
1.6.5	<a href="#"><u>Traffic Volumes</u></a>
1.6.6	<a href="#"><u>Level of Service</u></a>
1.6.7	<a href="#"><u>Accidents/Safety</u></a>
1.7	<a href="#"><u>Modal Interrelationships</u></a>
1.8	<a href="#"><u>SUMMARY</u></a>
2	<a href="#"><u>REFERENCES</u></a>

## List of Tables

1-1	<a href="#"><u>Existing (1998) and Forecast Average Daily Traffic (ADT) and Forecast Peak Hour Volume</u></a>
1-2	<a href="#"><u>Level of Service Criteria</u></a>
1-3	<a href="#"><u>Design Hour Roadway Level of Service</u></a>
1-4	<a href="#"><u>Peak Hour Intersection Level of Service</u></a>
1-5	<a href="#"><u>Accident Rates</u></a>

## List of Figures

1-1	<a href="#"><u>Project Area</u></a>
1-2	<a href="#"><u>Existing (1998) and Forecast (2025) Average Daily Traffic</u></a>

# 1 Purpose of and Need for Action

## 1.1 INTRODUCTION

The North Carolina Department of Transportation's (NCDOT, 1999) 2000-2006 Transportation Improvement Program (TIP) includes a highway improvement project in Caldwell and Watauga counties at Blowing Rock from SR 1500 (Blackberry Road) north to US 221 in Blowing Rock. Consequently, studies are underway in accordance with the requirements set forth in the National Environmental Policy Act (NEPA) of 1969, as amended. This Purpose and Need Statement is the first phase in the preparation of an environmental document. Concurrence Point No. 1 of the NEPA/404 Merger Process, developing the purpose and need for the proposed action, should justify why the improvement must be implemented, should be as comprehensive as possible, and should be updated as appropriate throughout the development process of the proposed action.

## 1.2 PROJECT NEED

The primary needs of the proposed action include:

- **Traffic capacity deficiencies exist along US 321 within the project area and will continue to worsen.**

US 321 currently operates at a peak hour level of service (LOS) F between Blackberry Road and Green Hill Road (in Blowing Rock). Since LOS F reflects traffic volumes greater than the capacity of the road, it indicates high delays and basically no passing opportunities exist during peak periods. A primary reason for this condition is the mountainous terrain, which results in slow truck speeds. Within the balance of the project area in Blowing Rock, the level of service is an unacceptable (LOS D/E) at all locations along US 321.

In 2025, the road south of Green Hill Road would continue to operate at LOS F in the peak periods, although delays will increase substantially as traffic grows. Operations on US 321 through Blowing Rock would operate at LOS E between Green Hill Road and US 321 Business. Between US 321 Business and US 221, US 321 would operate at LOS F. Traffic under these conditions would be extremely congested during peak periods.

Refer to [Table 1-3](#) and [Table 1-4](#) in [section 1.6.6](#), "Level of Service," for the exact locations expected to operate at undesirable levels of service and [Table 1-2](#) for level of service definitions.

- **Accident rates on existing US 321 within the Town of Blowing Rock are far higher than statewide averages for similar roads.**

The total accident rate for existing US 321 within Blowing Rock is 28 percent higher than similar urban US routes in North Carolina. The non-fatal injury accident rate is 23 percent higher, and the property damage accident rate is 30 percent higher than the state comparative rate. One fatality occurred within the last three years. Narrow lanes and poor sight distances, combined with turning vehicles at intersections and driveways appear to explain the high levels of accidents on US 321 in Blowing Rock.

Refer to [Table 1-5](#) in [section 1.6.7](#), "Accidents/Safety," for more specifics on the types and locations of accidents.

## 1.3 PROJECT PURPOSE

The primary purpose of the proposed action includes the following:

- **Improve traffic flow and level of service on US 321 from Blackberry Road to US 221.**

Without road improvements, the forecast traffic along this section of US 321 will exceed the road's capacity, creating undesirable levels of service. The proposed improvement will provide congestion relief.

- **Reduce accidents on US 321 within Blowing Rock.**

Without road improvements, high accident rates are expected to continue. The numbers of accidents will likely rise as traffic volumes continue to rise. Improvements could increase sight distances by straightening curves and could provide separate lanes for drivers turning left or an additional through lane.

## 1.4 BACKGROUND INFORMATION

### 1.4.1 Setting and Land Use

The project area is in western North Carolina and encompasses the northern part of Caldwell County and the southern part of Watauga County, including the resort community of Blowing Rock. (See Figure 1-1.) The project area extends well east of US 321 to encompass the locations of potential bypass alternatives. Land use in the project area includes scattered rural residential development in Caldwell County and eastern Blowing Rock, as well as concentrated low-density residential, commercial, and recreational development in Blowing Rock both east and west of US 321. Within Blowing Rock, US 321 passes through a district that is listed on the National Register of Historic Places. US 321 passes adjacent to the Green Park Inn and the Blowing Rock Country Club, which are included in the historic district. It also passes adjacent to a residential structure individually listed on the National Register. Development along US 321 in the southern portion of Blowing Rock is primarily low-density residential, while the primary development along US 321 in the northern portion of Blowing Rock is highway commercial. Development in Blowing Rock off of US 321 is primarily single-family residential with very few commercial structures. The Blue Ridge Parkway is not crossed by the existing road but a potential bypass alternative would pass under the Parkway in a tunnel.

### 1.4.2 Population Growth

Caldwell County's population grew 4.4 percent (67,746 to 70,709) from 1980 to 1990; between 1990 and 2000, the County is expecting a 4.4 percent growth in population (70,709 to 73,813). The rate of growth within Caldwell County is slower than surrounding counties and the State of

North Carolina.

Watauga County's population grew by 16.7 percent from 1980 to 1990 (31,666 to 36,952); a 10.2 percent increase in population is projected for the period 1990 to 2000 (36,952 to 40,726). The census population figures do not represent the seasonal/part-year residents. Blowing Rock's population rises to about 10,000 persons in the summer months, as estimated by Blowing Rock town planners.

### **1.4.3 Project History**

In 1993, an Environmental Assessment (EA) (NCDOT, August 1993) was prepared that recommended widening US 321 from NC 268 in Patterson to US 221 in Blowing Rock. Based on comments from the State Historic Preservation Officer and the general public, a Finding of No Significant Impact (FONSI) (NCDOT, September 1994) was prepared for the southern 10.8 miles of the project area, from NC 268 to SR 1500 (Blackberry Road). This section has independent utility and its selection did not preclude consideration of alignments in the Blowing Rock area. Because of the mountainous terrain, steep grades and poor alignment, improvements from NC 268 to SR 1500 are much needed from a safety and capacity standpoint. At public hearings, representatives of government, businesses, Appalachian State University, and the public spoke in favor of a four-lane US 321 between NC 268 and US 221. However, many citizens from Blowing Rock strongly preferred a project that included a bypass around Blowing Rock. The FONSI therefore indicated that an Environmental Impact Statement would be prepared for the northern 4.3 miles of the EA's project area [from SR 1500 (Blackberry Road) to US 221 in Blowing Rock] that compared the widening alternative with several Blowing Rock bypass alternatives.

## **1.5 THOROUGHFARE PLANNING**

### **1.5.1 Overview of the Thoroughfare Planning Process**

The thoroughfare planning process is a comprehensive transportation planning process that integrates urban area planning practices with local, regional, and statewide transportation planning practices. The process identifies transportation planning needs by evaluating land development and population growth trends in rural counties and urbanized areas. The process begins through a cooperative effort between the NCDOT's Statewide Planning Branch and local planning officials. Socio-economic data is collected, including business and residential area inventories, existing street inventories, identification of environmental constraints, and historical information of the area. A base year transportation model is built. Utilizing input from local planning officials, land development and population growth trends are projected and applied to the model. Through this modeling process and local knowledge of the area's socio-economic conditions, the thoroughfare planning team identifies transportation deficiencies and determines short- and long-term solutions for eliminating or diminishing those deficiencies.

### **1.5.2 Caldwell and Watauga County Thoroughfare Planning**

The 1981 Thoroughfare Plan prepared by the NCDOT for Caldwell County states that the number of lanes should be increased from two to four on US 321. When identifying future road improvement needs, the 1993 Thoroughfare Plan for Region D (Alleghany, Ashe, Avery, Mitchell, Watauga, Wilkes, and Yancy Counties) assumes that US 321 is widened as specified in the Transportation Improvement Program (see below). Watauga County adopted the Watauga County component of the Region D plan.

### **1.5.3 North Carolina Transportation Improvement Program**

The project is included as TIP No. R-2237C in the 2000-2006 North Carolina Transportation Improvement Program (NCDOT, 1999) covering the period from Federal Fiscal Year (FFY) 2000 to FFY 2006. Right-of-way acquisition and construction currently are not scheduled.

The following additional transportation improvement projects are near the project area:

R-2237A	Widen US 321 to a multi-lane road from NC 268 at Patterson to SR 1370 (Nelson Chapel Road) in Caldwell County. This project is under construction.
R-2237B	Widen US 321 to a multi-lane road from SR 1370 (Nelson Chapel Road) to SR 1500 (Blackberry Road) in Caldwell County. Design is scheduled for FFY 2001, right-of-way acquisition in FFY 2003, and construction in FFY 2005 or 2006.
R-529	Widen US 421 to a multi-lane road from NC 194 in Boone to two miles east of US 221 in Watauga County. This project is under construction.
U-3800	Widen to five lanes US 321 (Harden Street), Rivers Street (U-3406) to US 421/NC 194 in Boone. Design and right-of-way acquisition have started and construction is scheduled for State FY 2000.
R-2566	Widen NC 105 to a multi-lane road from US 221 in Avery County to SR 1107 in Boone. This project is identified as a future need only.
R-2615	Widen US 421 to a multi-lane road from US 221 in Boone to the Tennessee State Line. This project is identified as a future need only.

## **1.6 TRANSPORTATION NETWORK AND OPERATING CHARACTERISTICS**

### **1.6.1 Existing Road Network**

US 321 is designated as a principal arterial in the statewide highway network and carries both local and through traffic. It is a two-lane road within the project area and there is no control of access. Other US routes in Watauga and northern Caldwell counties are US 421, which passes east to

north through Watauga County and Boone, and US 221, which passes southwest to northeast through Watauga County via Blowing Rock and Boone. NC 105 and NC 194 also serve Watauga county. I-40 is the interstate highway nearest the project area, 40 miles southeast of Blowing Rock at US 321's juncture with I-40.

In the 1989 Highway Trust Fund Act, the North Carolina State legislature designated a network of US and state highways as intrastate corridors. The Intrastate System was established to connect major population centers and provide safe, convenient travel for motorists. The intrastate system plan calls for the widening of the system's existing two-lane sections to at least four travel lanes. US 321 from the South Carolina border south of Gastonia to its junction with US 421 west of Boone, North Carolina is part of the Intrastate System. This corridor is defined as the principal north-south route uniting the western Piedmont. US 421 is also a part of the Intrastate System.

### **1.6.2 Roadway Characteristics and Posted Speeds**

The roadway in the project area can be described best in three sections, each with common characteristics:

- The rural section south of Blowing Rock.
- The urban section between Green Hill Road and US 321 Business in Blowing Rock.
- The urban section between US 321 Business and US 221 in Blowing Rock.

The two-lane rural section south of Blowing Rock has a 22-foot paved travelway with a one-foot paved shoulder on each side and a speed limit of 50 miles per hour (mph). The horizontal alignment is poor with numerous sharp curves up to 30 degrees (design speed approximately 25 mph). In addition, the terrain is mountainous with nearly continuous grades between 6 and 8 percent uphill into Blowing Rock.

The two-lane urban section of US 321 between Green Hill Road and US 321 Business (which passes through the Green Park Historic District) is approximately 0.8 mile long, with a 24-foot pavement width and a travelway varying between 20 and 22 feet. The speed limit is 35 mph. Grass shoulders are either non-existent or very narrow. The horizontal alignment is fair with a series of four reverse curves up to 24 degrees (design speed approximately 30 mph). The terrain is rolling with a maximum grade of 3.5 percent.

The 1.4-mile urban section between US 321 Business and US 221 has two lanes with a pavement width varying between 20 and 22 feet and a speed limit of 35 mph. The northernmost 0.1 mile of this section has four lanes. The alignment is generally straight on rolling terrain with a maximum grade of five percent.

Passing opportunities along the entire project length are limited because of the terrain and sight distance restrictions.

### 1.6.3 Sidewalks and Pedestrian Movements

There are no sidewalks along the project, except for a single existing sidewalk in front of the Green Park Inn. Concentrations of pedestrian travel across US 321 occur at three points in Blowing Rock -- Green Hill Road area, Sunset Drive, and Possum Hollow Road. In the Green Hill Road area, pedestrians cross US 321 between the Green Park Inn and a parking lot opposite the Inn.

### 1.6.4 Intersections and Access Control

The US 221, Sunset Drive, and Possum Hollow Road/Shoppes on the Parkway intersections, all in Blowing Rock, are signalized. Traffic volumes on most intersecting roads are very light. No restriction on access to abutting properties currently applies.

### 1.6.5 Traffic Volumes

Figure 1-2 and Table 1-1 show the 1998 Average Daily Traffic (ADT) for each major link on US 321 and the 2025 forecast ADT. The existing 1998 ADT was 7,525 vehicles south of Blowing Rock, 8,325 to 10,000 vehicles south of Sunset Drive in Blowing Rock, and 11,750 to 15,350 vehicles north of Sunset Drive. The 1998 ADT figures are extrapolated volumes calculated by the NCDOT between its 1994 traffic counts and its 2025 forecasts. The original 1994 figures were actual counts taken in May as a part of preparation of a new Boone thoroughfare plan. May was chosen for the counts by the NCDOT after consultation with local officials and represents an “average” month. The forecast traffic volumes for the design year 2025 are based on local population and employment growth trends and the NCDOT’s 1998 Blowing Rock Origin and Destination Study.

The 2025 May ADT is forecast to be 14,100 vehicles south of Blowing Rock, 15,150 to 17,400 vehicles south of Sunset Drive in Blowing Rock, and 21,300 to 27,450 vehicles north of Sunset Drive. Traffic is expected to grow between 73 and 87 percent between 1998 and 2025.

The traffic volumes include eight percent daily truck traffic on US 321, including three percent tractor-trailers and five percent other trucks. Because non-truck traffic makes up a higher percentage of total traffic during peak hours, the peak hour truck percentages are assumed to be one-half of the daily percentage.

New or improved roads in North Carolina are designed to serve at an acceptable level of service a “design hourly volume” or peak hour traffic volume 20 to 25 years in the future. This volume is usually expressed as a percent of the ADT. For existing US 321 in 2025, the peak hour volume is forecast to be 14 percent of the ADT. The 2025 peak hour volumes for each US 321 link are shown in Table 1-1 and range between 1,970 and 3,840 vehicles per hour depending on the link.

### 1.6.6 Level of Service

Level of service (LOS) is a qualitative measure that characterizes the operational conditions within

a traffic stream and the perception of traffic service by motorists and passengers. The different levels of service characterize these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels are used to measure level of service. They range from the letter A to F. For roadways, LOS A indicates no congestion and LOS F represents more traffic demand than road capacity and extreme delays.

**Table 1-2** provides a general description of various level of service categories for roadways as given in the *1994 Highway Capacity Manual*, as well as descriptions for signalized and unsignalized intersections. Specific level of service definitions vary for two-lane highways, multi-lane highways, and intersections. In addition, the level of service for signalized and unsignalized intersections cannot be compared directly. In general, a poor level of service rating still can be considered acceptable for an unsignalized intersection. This is because the unsignalized intersection analysis is based upon the availability of gaps in traffic for minor street traffic, which means an intersection can have a poor level of service despite no delays on the major street. The signalized intersection analysis provides an overall average delay and level of service for the entire intersection.

New or upgraded roads in rural areas in North Carolina typically are designed for LOS C for the peak hour volume in the design year. This policy is based on pages 87 to 90 of *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 1994). For urban areas, LOS D is typically acceptable when it is too costly or environmentally damaging to design for a better level of service, but LOS C is preferred. The goal for the US 321 improvements is LOS C or better in 2025.

1998. **Table 1-3** presents the design hour level of service for each roadway link. As shown, US 321 currently operates at LOS F south of Green Hill Road (and Blowing Rock). Since LOS F reflects traffic volumes greater than the capacity of the road, it indicates high delays and basically no passing opportunities exist during peak periods. A primary reason for this condition is the mountainous terrain, which results in slow truck speeds. Through Blowing Rock, the level of service is unacceptable (LOS D/E) in all locations, except north of the signalized intersection of US 221. The better level of service north of Possum Hollow Road occurs because US 321 is four lanes north of that point.

**Table 1-4** summarizes the level of service for each intersection. All signalized and unsignalized intersections currently operate at LOS C or better. However, a few of the side-street movements at the unsignalized intersections are experiencing long delays (LOS F) during peak periods.

2025. **Table 1-3** also includes level of service for forecast 2025 traffic. The road south of Blowing Rock would continue to operate at LOS F in the peak periods although delays will increase substantially. Operations on US 321 through Blowing Rock would operate at LOS E between Green Hill Road and US 321 Business. Between US 321 Business and Possum Hollow Road, US 321 would operate at LOS F. Traffic flow under these conditions would be extremely congested during peak periods.

The level of service at all existing signalized intersections on US 321 would deteriorate to conditions worse than LOS F, as shown in [Table 1-4](#). The level of service of the unsignalized intersections at Green Hill Road, US 321 Business, and the Food Lion entrance also would deteriorate to F. A planning level signal warrant analysis (using ADT and peak hour-based warrants and the Institute of Transportation Engineers' (Kell and Fullerton, 1982) *Manual of Traffic Signal Design, Second Edition*) indicates the need for traffic signals at these intersections by 2025, although not as a part of an initial improvement, although for two of the three, through traffic would continue to operate at LOS F.

### **1.6.7 Accidents/Safety**

Accident data for the project area were assessed for the period between June 1, 1996 and April 30, 1999. Accident rates, categorized by fatal accidents, non-fatal injury accidents, property damage accidents, and total number of reported accidents, were compared to average rates for other roads with similar characteristics in North Carolina. Average crash rates for various roads in North Carolina are also based on NCDOT data for the years 1996 through 1998.

The accident rates are summarized as accidents per 100 million vehicle-miles driven. For example, if a 10-mile section of road carries an average of 10,000 vehicles per day, in one year 36.5 million vehicle-miles of travel would occur on that 10-mile stretch of road (10 miles times 10,000 vehicles per day times 365 days per year). If five accidents occur on this 10-mile section of road in a three-year period the accident rate is 4.6 accidents per 100 million vehicle miles. The 4.6 accidents per 100 million vehicle-miles assumes that over the three-year period 109.5 million vehicle-miles of travel occur (36.5 million times 3) and five accidents. The 4.6 is calculated by dividing 100 million vehicle-miles by 109.5 million and multiplying the result by 5). If one were interested in the average number of accidents per year, one would divide 5 by 3 for an average of 1.7 accidents per year.

[Table 1-5](#) shows the number of accidents from 1996 to 1999 and accident rates for the existing roadway compared with the average rates for similar US routes in North Carolina.

#### ***Rural Section***

The rural portion of US 321 starts at SR 1500 (Blackberry Road) and ends at the Blowing Rock town limits, 0.2 miles south of the intersection with Green Hill Road. It has a total length of 1.8 miles. As indicated in [Table 1-5](#), the accident rate for the rural portion is comparable to the state average for a rural roadway with similar characteristics. The rural portion of US 321 has a 23 percent lower non-fatal injury rate than the state as a whole, although the property damage only accident rate is 17 percent higher, resulting in a similar overall rate with lower severity. There were no reported fatal accidents during the reported period in this portion of US 321.

The majority of the accidents on the rural section were comprised of a few general

types. Forty-eight percent of the accidents involved single vehicles running off the road. In addition, 24 percent of the accidents were the result of vehicles striking the rear of a slower or stopped vehicle and 20 percent were angle accidents. The provision of extra lanes and standard shoulders could reduce these accidents substantially. Easing of the sharp curves could result in fewer vehicles running off the road and improve visibility to decrease rear-end accidents.

While weather plays a factor in some accidents, no specific trends were noted in the accident analysis. No data were available to measure the effect of fog on accidents.

### ***Urban Section***

The urban section of US 321 is a 2.3-mile route through the Town of Blowing Rock. It starts at the town limits, just south of Green Hill Road, and ends just north of Possum Hollow Road. The existing accident rates in the urban section are presented and compared with North Carolina averages in [Table 1-5](#). The total accident rate for existing US 321 through Blowing Rock is 28 percent higher than similar urban US routes in North Carolina. The non-fatal injury accident rate is 23 percent higher and the property damage accident rate is 30 percent higher than the state comparative rate.

One fatality did occur during the three year period. A high fatality rate resulted from only one fatality because of the low exposure for the three-year accident study period. It takes more than three years for 100 million miles of travel to occur on this segment of US 321 and the number of fatal accidents in North Carolina is far lower than for other types of accidents. Thus, the differences between Blowing Rock's three-year record of one fatality and the statewide averages for the same period are not statistically significant. The high accident rate overall and the high rates for the other two more common types of accidents, however, are indicative of a road that is not as safe as it could be.

Accident records indicate that almost all intersections on this section of US 321 are prone to a high number of accidents. A majority of these accidents, 48 percent of the total, involved vehicles rear-ending slow or stopped vehicles. An additional 24 percent involved angle collisions. Between US 321 Business and US 221 on the northern end of this section, accidents often were related to traffic entering/exiting driveways. No weather-related trends were observed in the urban section.

The analysis identified five specific high accident locations. Of the five locations identified, four were individual intersections. The single roadway section identified includes a series of reverse curves (curve in one direction that is followed almost immediately by a curve in the opposite direction), as well as two closely spaced intersections with poor sight distance. The locations are:

- Green Hill Road intersection – 6 total accidents, 5 injuries
- Road section that includes intersections with Pinnacle Avenue and Country Club Road -- 10 total accidents, 8 injuries, and 1 fatality.
- US 321 Business intersection -- 18 total accidents, 9 injuries.
- Sunset Drive signalized intersection -- 16 total accidents, 2 injuries.
- Possum Hollow Road/Shoppes on the Parkway signalized intersection -- 18 total accidents, 12 injuries.

## 1.7 MODAL INTERRELATIONSHIPS

The project area is not served by rail. An airport is in Boone. There is no relationship between the proposed project and the airport in Boone.

## 1.8 SUMMARY

The proposed improvement is included in county thoroughfare plans and the NCDOT's 2000 to 2006 Transportation Improvement Plan. Without the proposed action, the forecast traffic along this section of US 321 will exceed the road's capacity, creating undesirable levels of service. Improvements are needed to provide congestion relief. In addition, without improvement, high accident rates are expected to continue. The number of accidents will likely rise as traffic volumes continue to rise. Improved sight distances can be created by straightening curves and by providing separate lanes for drivers turning left or providing with an additional through lane an opportunity for through traffic to pass those turning.

This portion of US 321 is part of the North Carolina Intrastate System. The US 321 corridor is defined as the principal north-south route uniting the western Piedmont.

The proposed project is a reasonable expenditure of public funds even if no additional improvements are made.

## 2. REFERENCES

American Association of State Highway and Transportation Officials. 1994. *A Policy on Geometric Design of Highways and Streets*. American Association of State Highway and Transportation Officials, Washington, DC.

Kell, J.H. and I.J. Fullerton. 1982. *Manual of Traffic Signal Design, Second Edition*. Institute of Transportation Engineers, Washington, DC.

North Carolina Department of Transportation. August 1993. *Administrative Action Environmental Assessment and Draft Section 4(f) Evaluation*. Prepared by Parsons Brinckerhoff Quade &

Douglas, Inc. in association with Wapora, Inc.

North Carolina Department of Transportation. September 1994. *Administrative Action Finding of No Significant Impact*. Prepared by Parsons Brinckerhoff Quade & Douglas, Inc.

North Carolina Department of Transportation. 1981. *Caldwell County Thoroughfare Plan*.

North Carolina Department of Transportation. 1993. *Region D Thoroughfare Plan (Alleghany, Ashe, Avery, Mitchell, Watauga, Wilkes, and Yancy Counties)*.

North Carolina Department of Transportation. 1999. *Transportation Improvement Program 2000-2006*.