
SUMMARY

1. Federal Highway Administration

Administrative Action Environmental Impact Statement

(x) Draft () Final

(x) Draft Section 4(f) Evaluation included

2. Contacts

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3. Brief Description of the Project

In August 1993, the North Carolina Department of Transportation (NCDOT) prepared an Environmental Assessment (EA) that recommended widening US 321 from two to four lanes from NC 268 in Patterson to US 221 in the resort community of Blowing Rock. The proposed improvements are in northern Caldwell County and southern Watauga County. It was expected that the widening would improve traffic flow and reduce accidents. Current accident rates on US 321 within the Town of Blowing Rock are far higher than statewide averages for similar roads. The proposed improvements are included in county thoroughfare plans and the NCDOT's 2006 to 2008 Transportation Improvement Plan (TIP).

However, many residents of Blowing Rock strongly preferred a project that included a bypass around Blowing Rock. Therefore, it was decided that a Draft Environmental Impact Statement (DEIS) would be prepared for the northern 4.3 miles (6.9 kilometers) of the EA's project area (from Blackberry Road to US 221 in Blowing Rock). The DEIS compares a widening alternative with several bypass alternatives.

A No-Build and five Build Alternatives are evaluated in this DEIS. The No-Build Alternative fails to meet the "purpose and need" of the proposed project because it neither increases capacity nor decreases accidents. The five Build Alternatives, shown in Figure S-1 and described below, are the Widening Alternative, Bypass Alternative 1A, Bypass Alternative 1B, Bypass Alternative 4A, and Bypass Alternative 4B. All of the Build Alternatives meet the purpose and need of the proposed project.

Figure S-1 Build Alternatives

This Figure may be viewed by clicking the [List of Figures](#)

With one exception, all of the alternatives call for four lanes and a design speed of 50 miles per hour (mph) (80 kilometers per hour (km/h)) and a posted speed of 45 mph (72 km/h). In the Town of Blowing Rock, the Widening Alternative would have a design speed of 40 mph (64 km/h) and a posted speed of 35 mph (56 km/h)). Because of the steep terrain of the project area, retaining walls are an important characteristic of all the Build Alternatives. The five Build Alternatives are compared with the No-Build Alternative in Table S-1 and the findings are summarized below.

3.1 Widening Alternative

This alternative would widen US 321 from two lanes to four lanes from Blackberry Road through the Town of Blowing Rock. Curves would be eased south of Blowing Rock and in the Norwood Circle and County Club Drive area of Blowing Rock. The project would include a four-lane section with shoulders until the Gideon Ridge area south of the Blowing Rock town limits; a four-lane section with curb and gutter and some turn lanes in Blowing Rock south of US 321 Business; and four lanes with a landscaped median north of US 321 Business. Several intersections also would be improved. The total cost of the Widening Alternative, including both right-of-way and construction costs, is expected to be \$45.9 million.

The Widening Alternative would meet the project's Purpose and Need. The Widening Alternative would improve traffic operations along the entire length of US 321 to LOS D or better through 2025. The project would achieve the desired peak hour LOS C along the roadway at all locations except between US 221 and Shoppes on the Parkway where an acceptable LOS D would occur. The Widening Alternative would also help reduce accidents and increase safety along existing US 321 through more gentle curves and wider lanes.

3.2 Bypass Alternatives 1A and 1B

Bypass Alternatives 1A and 1B would follow the current US 321 alignment between Blackberry Road and the Gideon Ridge area. They would then follow along the side of Green Hill, pass under Green Hill Road, and then through the east part of Blowing Rock. They rejoin US 321 at its intersection with Possum Hollow Road. The bypass includes four 12-foot (3.6-meter) lanes and a 4-foot (1.2-meter) painted median. These alternatives assume that no improvements are made to US 321 north of its southern intersection with the bypass. The total cost for Bypass Alternative 1A is estimated to be \$75.1 million. The total cost for Bypass Alternative 1B, including both right-of-way and construction costs, is estimated at \$92.2 million.

The impacts of Bypass Alternative 1B are essentially the same as Bypass Alternative 1A. However, instead of a major fill east of Gideon Ridge, Alternative 1B includes a cut at Gideon Ridge, which eliminates the only curves that do not meet the project's horizontal curve criteria.

Building the Bypass Alternatives 1A or 1B would meet the purpose and need of the project. This bypass would attract an average of 12,300 vehicles per day in 2025. Traffic would drop 30 to 78 percent on existing US 321, with the greatest drops occurring south of Sunset Drive. A peak hour LOS B would occur the full length of the bypass. Improvements to US 321 however, would be needed to maintain LOS C on existing US 321 between the southern end of the bypass and Green Hill Road (LOS D), Sunset Drive to the Food Lion Driveway (LOS D), and the Food Lion driveway to US 221 (LOS E).

Bypass Alternatives 1A and 1B would not include road improvements on the existing road (except south of Blowing Rock) that would reduce accident rates. They would reduce traffic however on the existing road, reducing the opportunity for accidents. Traffic on the bypass would have the advantage of wider pavement, gentler curves, and wider shoulders.

3.3 Bypass Alternatives 4A and 4B

Bypass Alternatives 4A and 4B would completely bypass the Town of Blowing Rock. These alternatives would cross a valley at their southern end, follow the Blue Ridge escarpment (see Figure S-1) to a tunnel under the Blue Ridge Parkway, follow a side hill paralleling Thunder Mountain Road, and end at Aho Road north of the Parkway. The bypass includes four 12-foot (3.6-meter) lanes and a 4-foot (1.2-meter) painted median. The alternatives assume that no improvements are made to US 321 north of its southern intersection with the bypass. Both alternatives have the highest right-of-way and construction costs. The total cost to implement Bypass Alternative 4A, including both right-of-way and construction costs, is estimated at \$170.5 million. The total cost for Bypass Alternative 4B, including both right-of-way and construction costs, is estimated at \$250.3 million.

The major difference between Bypass Alternative 4A and Bypass Alternative 4B is that 4B utilizes a greater number of bridges to reduce earthwork, changes in the terrain, natural resource loss, and visual impacts. Bypass Alternative 4A includes five bridges; Alternative 4B includes 12 bridges.

Building either Bypass Alternative 4A or 4B would meet the Purpose and Need of the project. This bypass would attract an average of 10,400 vehicles per day (vpd) in 2025. Traffic would drop 40 to 70 percent on existing US 321, with the greatest drops occurring south of Sunset Drive. This bypass would attract less traffic than Bypass Alternatives 1A and 1B because its northern terminus is north of the Blue Ridge Parkway. Thus, traffic traveling between the Parkway and points south would pass through Blowing Rock rather than use the Bypass (Alternative 4A or 4B). Since they would begin just north of Blackberry Road, Bypass Alternatives 4A and 4B would include almost no road improvements on the existing road that would reduce accident rates. Like Bypass Alternatives 1A and 1B, they would reduce the traffic on the existing road, thus reducing the opportunity for accidents. Traffic on the bypass would have the advantage of wider pavement, gentler curves, and wider shoulders.

4. Other Proposed Actions

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

- Widening US 321 to a multi-lane road from SR 1370 (Nelson Chapel Road) to SR 1500 (Blackberry Road) in Caldwell County. Design began in FFY 2001, right-of-way acquisition is scheduled for FFY 2002, and construction is scheduled for FFY 2005.
- Widening US 421 to a multi-lane road from NC 194 in Boone to 2 miles (3.2 kilometers) east of US 221 in Watauga County. Part of this project is now under construction.
- Widening to five lanes US 321 (Harden Street), Rivers Street (U-3406) to US 421/NC 194 in Boone in Watauga County. This project is now under construction.

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Widening Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Design Criteria						
Number of Lanes	2	4	4	4	4	4
Design Speed	Existing	40 mph (64 km/h)(50 mph [80 km/h] south of Blowing Rock)	50 mph (80 km/h)	50 mph (80 km/h)	50 mph (80 km/h)	50 mph (80 km/h)
Posted Speed	Existing	35 mph (56 km/h) (45 mph (72 km/h) south of Blowing Rock)	45 mph (72 km/h)	45 mph (72 km/h)	45 mph (72 km/h)	45 mph (72 km/h)
Design Criteria Exceptions	Existing	Steep grade and sharp curves between Blackberry Road and Green Hill Road	Steep grade when following existing US 321; tight curves in Blackberry Condominium area (particularly undesirable since only curve exceptions on entire alternative)	Steep grade when following existing US 321	None	None
Median Width	No median	4' (flush/painted) south of Blowing Rock); none south of US 321 Business; 16' (landscaped) north of US 321 Business	4' (flush/painted)	4' (flush/painted)	4' (flush/painted)	4' (flush/painted)
Cost						
Right-of-Way	\$0	\$23,400,000	\$24,500,000	\$25,200,000	\$9,400,000	\$8,900,000
Construction	\$0	\$22,500,000	\$50,600,000	\$67,000,000	\$161,100,000	\$241,400,000
TOTAL	\$0	\$45,900,000	\$75,100,000	\$92,200,000	\$170,500,000	\$250,300,000
Traffic Service						
2025 Average Daily Traffic on Existing US 321	14,100 to 27,450	14,100 to 27,450	3,100 to 26,150	3,100 to 26,150	6,050 to 16,400	6,050 to 16,400
Number of Road Segments (Blackberry Road to Possum Hollow Road) With Less Than Desirable 2025 Design Hour Level Of Service (D, E, or F)						
• Existing US 321	8 of 8	1 of 8	3 of 8	3 of 8	4 of 8	4 of 8
• Bypass	N/A	N/A	0 of 3	0 of 3	0 of 4	0 of 4

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Widening Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Worst Performing Segments in 2025 Design Hour						
<ul style="list-style-type: none"> Up to US 321 Business (LOS) 	All (F)	Green Hill Road to US 321 Business (C)	Bypass to Green Hill Road (D)	Bypass to Green Hill Road (D)	Bypass to Green Hill Rd. (D); Goforth Rd. to US 321 Bus. (D)	Bypass to Green Hill Rd. (D); Goforth Rd. to US 321 Bus. (D)
<ul style="list-style-type: none"> US 321 Business to Possum Hollow Road (LOS) 	US 321 Bus. to US 221 (F); US 221 to Possum Hollow Rd. (E)	US 221 to Possum Hollow Road (D)	Sunset Dr. to Food Lion (D); Food Lion to US 221 (E)	Sunset Dr. to Food Lion (D); Food Lion to US 221 (E)	Food Lion to US 221 (E); US 221 to Possum Hollow Road (E)	Food Lion to US 221 (E); US 221 to Possum Hollow Road (E)
Number of Intersections Along Existing US 321 With Less Than Desirable 2025 Design Hour Level of Service (D, E, or F)						
<ul style="list-style-type: none"> Signalized 	3 of 3	1 of 6	1 of 3	1 of 3	2 of 3	2 of 3
<ul style="list-style-type: none"> Unsignalized (US 321 traffic) 	3 of 4	0 of 1	0 of 4	0 of 4	0 of 4	0 of 4
<ul style="list-style-type: none"> Unsignalized (side street traffic) 	4 of 4	0 of 1	1 of 4	1 of 4	2 of 4	2 of 4
Community Impacts						
Relocation						
<ul style="list-style-type: none"> Homes 	0	16	24	24	8	6
<ul style="list-style-type: none"> Businesses 	0	8	1	1	1	1
Economics	Increasing congestion at businesses	Business loss during construction; landscaped median would affect businesses in a minor way	Loss of sales for some businesses as a result of bypassed traffic; greatest potential to lower property values; travel benefits do not offset construction costs	Loss of sales for some businesses as a result of bypassed traffic; greatest potential to lower property values; travel benefits do not offset construction costs	Loss of sales for some businesses as a result of bypassed traffic; travel benefits do not offset construction costs	Loss of sales for some businesses as a result of bypassed traffic; travel benefits do not offset construction costs
Land Use Plan Compatibility						
<ul style="list-style-type: none"> Caldwell County 	Yes	Yes	Yes	Yes	Yes with extended zoning coverage	Yes with extended zoning coverage
<ul style="list-style-type: none"> Watauga County 	Would not improve transportation	Yes	Yes	Yes	Does not protect and maintain rural atmosphere	Does not protect and maintain rural atmosphere
<ul style="list-style-type: none"> Blowing Rock 	Yes	Alters topography, removes vegetation, affects historic resources	Bisects developing residential area	Bisects developing residential area	Yes	Yes
Farmlands	None	None	None	None	None	None

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Widening Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Neighborhoods and Community Disturbances	None	Reduced community character	Divides several neighborhoods; reduced community character	Divides several neighborhoods; reduced community character (more than 1A with cut in Gideon Ridge)	Reduced isolation of rural homes	Reduced isolation of rural homes
Community Facilities and Resources	No benefits	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles
Visual Impacts	None	Reduced intimacy, unity, and intactness of the setting of Green Park Historic District and the mostly residential area between the Green Park Historic District and US 321 Business	Breaks rolling landscape; four residential areas would have substantial visual impacts	Breaks rolling landscape; four residential areas would have substantial visual impacts; additional impact of the cut in Gideon Ridge	Views affected in two rural residential areas and the Green Hill and Blackberry Condominium areas; substantial impact on views from the Thunderhill overlook area (two views of high value)	Views affected in two rural residential areas and the Green Hill and Blackberry Condominium areas; impact on views from the Thunderhill overlook area (two views of high value) but less impact than 4A
Air Quality	No impact	No impact	No impact	No impact	No impact	No impact
Noise						
# of Sensitive Receptors With Noise Levels Exceeding FHWA Noise Abatement Criteria	19	28	6	4	4	4
# With Substantial Increase in Noise	0	0	21	32	20	19
# With Both Impacts	<u>0</u>	<u>0</u>	<u>42</u>	<u>25</u>	<u>1</u>	<u>1</u>
TOTAL	19	28	69	61	25	24
Historic Resources						
Adverse Effect	None	Green Park Historic District and Green Park Inn	None	None	Blue Ridge Parkway	Blue Ridge Parkway
No Adverse Effect	None	Bollinger-Hartley House; Blue Ridge Parkway	Blue Ridge Parkway	Blue Ridge Parkway	None	None

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Evaluation Category	No-Build Alternative	Build Alternatives				
		Widening Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Parklands						
Blowing Rock Assembly Grounds (private)	None	None	2 structures removed; entrance changed	2 structures removed; entrance changed	None	None
Blowing Rock Country Club (private)	None	Changed views from golf course; retaining wall	None	None	None	None
Blue Ridge Parkway (public)	None	Some visual change	Some visual change	Some visual change	Substantial visual impact (large cuts and fills visible from Parkway)	Visual impact (bridges and some cuts and fills visible from Parkway)
Ecological Resources						
Terrestrial						
• Acres of Natural Plant Community Used	None	27	39	36	93	47
• Habitat Fragmentation	None	Least	Moderate	Moderate	Greatest	Moderate
Jurisdictional Areas						
• # of Stream Crossings by culvert	Existing	4	2	2	13	5
• # of Stream Crossings by bridge	Existing	0	2	3	6	14
• Parallel Fill in Stream -linear feet/meters (acres/hectares)	None	1,070/3261 (0.24/0.09)	190/58 (0.05/0.02)	590/180 (0.14/0.06)	0 (0.00)	125/381 (0.01/0.004)
• Wetland Impacts(acres)	None	0.07	0.00	0.00	0.09	0.01
Threatened or Endangered Species	None	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)
Floodplains Affected	None	840 feet (256 meters) crossed	None	None	<0.1 acre of fill in floodplain	<0.1 acre of fill in floodplain
Underground Storage Tanks Affected	N/A	4	1	1	1	1

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Widening Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Utilities Affected	None	Affected throughout; placed underground within Blowing Rock	Generally affected at local road crossings and along where follows existing US 321	Generally affected at local road crossings and along where follows existing US 321	Relocates power substation	Relocates power substation
Cumulative Impacts	From current reasonably foreseeable development	From current reasonably foreseeable development plus Widening Alternative	From current reasonably foreseeable development, potential shifts in future development from eastern Blowing Rock to other locations, and bypass	From current reasonably foreseeable development, potential shifts in future development from eastern Blowing Rock to other locations, and bypass	From current reasonably foreseeable development, potential induced development at southern and northern ends of bypass, and bypass	From current reasonably foreseeable development, potential induced development at southern and northern ends of bypass, and bypass
Construction Impacts						
Construction Period	None	3 to 4 construction seasons (2 to 3 if utilities not placed underground)	2 to 3 construction seasons	3 to 4 construction seasons	4 construction seasons	4 to 6 construction seasons
Construction in Close Proximity to Homes	None	Yes	Yes	Yes	Yes but limited to rural areas except construction equipment supplies taken through eastern Blowing Rock during mobilization	Yes but limited to rural areas except construction equipment supplies taken through eastern Blowing Rock during mobilization
Affect of on Construction Business Access	None	Greatest	Only in US 221/Shoppes on the Parkway area	Only in US 221/Shoppes on the Parkway area	None	None
Potential to Disrupt Traffic Movements	None	Greatest	Moderate	Moderate	Least	Least except substantially greater use of US 321 to transport prefabricated bridge components than 4A
Excavation (yd ³)	0	769,440	1,464,953	2,104,706	3,038,840	975,778
Fill (yd ³)	0	796,837	1,240,012	707,652 (plus 1.4 million yd ³ of waste that would be extremely difficult to dispose)	2,946,946	1,100,924
Potential for Sedimentation Impacts to Streams	None	5 stream crossings	4 stream crossings	5 stream crossings	20 stream crossings	20 stream crossings (more streams bridged but streams affected by haul roads)

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- Widening NC 105 to a multi-lane road from US 221 in Avery County to SR 1107 in Boone in Watauga County. This project is identified as a future need only.
 - Widening US 421 to a multi-lane road from US 221 in Boone to the Tennessee State Line in Watauga County. This project is identified as a future need only.
 - Widening US 221 to four lanes divided from US 421 in Watauga County to US 221 Bypass South of West Jefferson in Ashe County. Planning began in FFY 2001, design is scheduled for FFY 2002, and right-of-way acquisition for FFY 2008.

5. Other Alternatives Considered

5.1 Alternatives to a Four-Lane Project

Potential alternatives to a four-lane project include the No-Build Alternative; postponement of improvements; redesignation of US 321; transit; and transportation systems management improvements (improved two-lane and three-lane alternatives).

No-Build Alternative

The No-Build Alternative would only call for the transportation improvements listed for Blowing Rock and northwestern North Carolina in the State Transportation Improvement Program for 2002 to 2008. The No-Build Alternative will not increase the capacity of US 321 in the project area or change the road features that contribute to the area's high accident rate. Therefore, this alternative would not meet the purpose and need for the project. The No-Build Alternative is compared with the five Build Alternatives in the DEIS. There are no direct environmental impacts associated with the No-Build Alternative.

Postponement of Improvements

With this alternative, no immediate improvements would be made to US 321. Postponement would result, however, in steadily increasing traffic flow and accidents as traffic volumes continue to rise. Property acquisition and construction costs would also rise. Project impacts would ultimately occur and could become more severe over time. Thus, postponing the implementation of improvements is not proposed.

Redesignation of US 321

During the preparation of the 1993 Environmental Assessment, a citizens group proposed that a different highway route between Lenoir, North Carolina, and Hampton, Tennessee, be designated as US 321. This alternative was evaluated in 1992 and again in the fall of 2000. The studies found that the citizen-proposed route would not serve as an alternative to widening US 321 from Patterson to Blowing Rock because the amount of traffic that would shift to the redesignated route would be small and the capacity and safety needs of US 321 in the project area would not change.

Transit Alternative

A transit alternative was also evaluated for the project area. It was determined that less than two percent of the trips in the Blowing Rock area were likely to be attracted to transit, while as much

as 70 percent of all peak-hour traffic on US 321 in 2025 would have to be served by transit to achieve an acceptable level of service. Therefore, it was concluded that transit could not meet the purpose and need of the project.

Transportation Systems Management (Two-Lane and Three-Lane Alternatives)

Transportation Systems Management (TSM) is defined as modest physical and operational improvements to traffic performance, safety, and management. Potential TSM strategies that could be applied to the US 321 corridor include left- and right-turn lanes and/or a third turning lane; widening of existing lanes to 12-foot (3.6-meter) lanes with standard shoulders; straightening of substandard horizontal curves; and elimination or substantial reduction of curb cuts (driveways). Studies found that, for the project area, TSM improvements would not provide an adequate level of traffic service through 2025.

5.2 Other Build Alternatives

In 1995, 17 potential bypass alternatives were evaluated. Engineering, traffic, social, cultural resource, natural resource, and visual considerations were taken into account in comparing the potential bypass alternatives. At the end of the bypass alternatives study in 1997, four of the 17 alternatives were selected for detailed evaluation in the DEIS (Bypass Alternatives 1 through 4). The 13 alternatives were eliminated from further consideration for one or more of the following reasons:

- Higher cost;
- Substantially more earthwork;
- Greater natural resource impacts;
- Social impacts to the rural communities south of Blowing Rock;
- A substantial segment of US 321 would be left unimproved;
- Steep grades and sharp curves on US 321 would not be bypassed;
- Alternatives were essentially different design variations in the same corridor;
- Northern ending point was opposed; and
- Potential impacts to the Blowing Rock Assembly Grounds (a church camp).

In July 1999, based on stakeholder comment, the NCDOT decided that the Widening Alternative, Bypass Alternative 1, and Bypass Alternative 4 would be evaluated in detail in the DEIS. This decision to carry forward the Widening Alternative and Bypass Alternative 1 was affirmed in early 2001 in a joint decision with the Federal Highway Administration (FHWA) and state and federal regulatory agencies. State and federal regulatory agencies did not agree that Bypass Alternative 4 should be included in the DEIS as a detailed study alternative. Although Bypass Alternative 4 would have a high cost and substantial natural resource and visual impacts, it is evaluated in detail because it has strong public support. Bypass Alternative 1 is evaluated in detail because it avoids all impacts to historic properties. Bypass Alternatives 2 and 3 were dropped from further consideration because of visual impacts, substantial earthwork, impacts to the Blowing Rock Assembly Grounds, and lack of public support.

For each of the Bypass Alternatives chosen for full evaluation in the DEIS (Alternatives 1 and 4), two preliminary designs were developed. Bypass Alternative designs 1A and 1B and Bypass Alternative designs 4A and 4B were described in Section 3.

6. Major Environmental Impacts

Major environmental impacts associated with the Build Alternatives are summarized in Table S-1. A general description of the impacts for each alternative follows.

6.1 Widening Alternative

The Widening Alternative would involve relocating 16 residences and eight businesses. This alternative features four lanes, additional traffic signals, and shallower curves, particularly south of US 321 Business. It would give the Town of Blowing Rock a more urban feel, reducing the current small town atmosphere of this resort community. A landscape plan would be implemented to mitigate this impact. Because the alternative would be along the existing highway corridor, it would not pass through any Blowing Rock neighborhoods or rural communities. Persons choosing to cross US 321 on foot (with or without a bicycle) would have more pavement to cross. None of the alternatives would adversely affect community facilities or resources. There are no concentrations of any one racial or ethnic group or low-income populations within the three project corridors.

The Widening Alternative would have an adverse impact on the Green Park Historic District and on the Green Park Inn. A total of approximately 3.7 acres of new right-of-way would be acquired and converted to highway use within the Green Park Historic District. Two contributing structures and associated low stone walls would be displaced. Views from the properties within the district and views of the district from the road would change.

The Widening Alternative would cross six streams and 27 acres of natural plant communities. It would involve the greatest amount of fill in streams (1,070 linear feet (326 meters)). All alternatives would affect less than one acre of wetlands. The Widening Alternative would involve the least wildlife habitat fragmentation because of the urbanized nature of its corridor.

The predicted noise levels for the Widening Alternative are expected to exceed the FHWA Noise Abatement Criteria (NAC) at 28 of 182 modeled sites. These sites are adjacent to US 321 in areas where the widening would move the roadway and, therefore, vehicular traffic, closer to residences. In no case would the Widening Alternative cause a substantial increase in noise levels.

The Widening Alternative would have little effect on development projects under way in Blowing Rock or on development trends. The cumulative community impacts of the Widening Alternative would be primarily associated with the project's direct community impacts and current development trends. The Widening Alternative would add to indirect impacts to stream hydrology and headwater drainage of the Yadkin River.

6.2 Bypass Alternative 1A

Bypass Alternative 1A would displace 24 residences and one business. This alternative would pass through a developing residential area of Blowing Rock and add a thoroughfare to an area of local streets and single-family homes, in some cases dividing neighborhoods. It is the least desirable alternative from the perspective of land use planning.

With Bypass Alternative 1A, existing US 321 in the Town of Blowing Rock would be unchanged. Traffic volumes between US 321 Business and US 221 would be similar to what

they are today. Traffic would continue to increase north of US 221. South of US 321 Business, volumes would be roughly half of what they are today.

The most substantial visual impacts would occur where the bypass passes through several subdivisions in east Blowing Rock. Features in this area would include the pavement surface, cut-and-fill slopes, bridges, vegetation clearing, and retaining walls. These features would markedly change the scale of existing views. Trees would be planted on the slopes adjacent to both sides of the proposed roadway where the existing landscape would be altered. The impact of Bypass Alternative 1A on Parkway views would be minimal; it would not diminish the integrity of the Parkway's significant historic and parkland features. Bypass Alternative 1A will have No Adverse Effects on historic resources.

Bypass Alternative 1A (and Bypass Alternative 1B) would have a substantially greater noise impact than the other alternatives.

Bypass Alternative 1A would cross five streams and use 39 acres of natural plant communities. Implementation of this alternative would have intermediate wildlife impacts in comparison to the other alternatives and would have the least amount of jurisdictional stream impacts (730 to 780 feet (223 to 238 meters)). Bypass Alternative 1A would not affect a 100-year floodplain or a floodway.

Because a part of the Bypass Alternative 1A corridor would be in areas currently developed or being developed for residential use, the desirability of the remaining lots near the project corridor would likely decrease because of visual change and traffic noise. The loss of subdivided lots and the reduced desirability of remaining nearby lots could shift anticipated residential growth to other parts of Blowing Rock and the region. The cumulative community impacts of Bypass Alternative 1A would be primarily associated with the project's direct community impacts and their affect on current residential development patterns.

Bypass Alternative 1A would eliminate almost all horizontal curve design exceptions along US 321 up to the Blackberry Condominiums by decreasing the cuts into the existing terrain and increasing the fills on the east side of the road. This bypass, however, would include a major exception to the project's horizontal design criteria where two sharp curves would remain along the road. Although such curves could be marked to warn drivers to slow down, their presence would violate the expectations of southbound drivers, who would up to that point have experienced mostly gentle curves on the bypass and would be traveling downhill on a steep (6 percent) grade. Northbound travelers would reach these curves up hill on a 7 percent grade on a generally curvier road, similar to what exists today.

Bypass Alternative 1A would require extensive fill south and east of Gideon Ridge. Because the majority of the excavation would occur north of Green Hill Road and the majority of the fill would occur south of Gideon Ridge, substantial amounts of material would have to be trucked from the northern to the southern part of the project area during construction.

6.3 Bypass Alternative 1B

The impacts of Bypass Alternative 1B are essentially the same as Bypass Alternative 1A. However, instead of a major fill east of Gideon Ridge, Alternative 1B would include a cut at Gideon Ridge, which would eliminate the only curves that do not meet the project's horizontal curve criteria. The cut would increase community impacts. In order to lessen the visual impacts,

landscape treatments would include cut and fill slope planting along the entire length of all bypass alternatives.

With Alternative 1B, the combination of the alternative's alignment between Gideon Ridge and Green Hill, the large cut into Gideon Ridge, and the series of cuts that occur as the bypass passes through Blowing Rock make it more difficult to balance the earthwork than with Bypass Alternative 1A. Earthwork is balanced when the amount of earth and rock excavated from hills is the same as the amount needed to fill depressions. Preliminary earthwork computations for Bypass Alternative 1B show that there would be approximately 1.4 million cubic yards (1.1 million cubic meters) of surplus material. The logistics involved with disposal of 1.4 million cubic yards (1.1 million cubic meters) of earth and rock are daunting. To achieve maximum benefit (and least cost), the disposal location should be adjacent to the Bypass Alternative 1B project corridor. One possible location in the project corridor would be next to US 321 just north of where the bypass leaves the cut into Gideon Ridge and begins to proceed towards Green Hill. Hauling this much surplus along area highways would require approximately 155,000 trips.

6.4 Bypass Alternative 4A

Bypass Alternative 4A would displace eight residences and one business. This alternative would substantially affect two rural communities by introducing a thoroughfare to an area of mostly isolated homes. It would make rural land more accessible to development and thus not be compatible with the goals of local land use plans.

Features of Bypass Alternative 4A would include the new pavement surface, two bridges, vegetation clearing, cut-and-fill slopes, and four retaining walls measuring up to 60 feet (18.3 meters) in height and as long as 630 feet (192 meters) on the west side of the road. The impact of the introduction of the roadway in this area would worsen as it approaches the Blue Ridge Parkway. A revegetation plan has been proposed as mitigation. The visual change caused by Bypass Alternative 4A would have an adverse effect on the Parkway from an historic resource perspective given the nature of the impact, the goals of the Parkway, and the value of the Thunderhill overlook view. None of the Build Alternatives would use land from the Blue Ridge Parkway.

Bypass Alternative 4A would have the greatest effect on ecological resources in the project area, crossing 20 streams (six would be bridged), using 93 acres of natural plant communities, and involving the greatest fragmentation of habitat. Long-term displacement would be expected for forest-interior species.

The cumulative community impacts of Bypass Alternative 4A would primarily be associated with its direct community impacts and their effect on development patterns in rural Caldwell and Watauga counties. Cumulative natural resource impacts would include long-term increases in sedimentation and intensity of runoff flows; deposition of petroleum products, fertilizers, and road salt into Yadkin and New River Basins; the potential elimination of many plant species in these areas; and fragmentation of large forested areas on the Blue Ridge escarpment.

Bypass 4A would require 3 million cubic yards (2.3 million cubic meters) of earthwork, the most of any alternative.

6.5 Bypass Alternative 4B

Bypass Alternative 4 B would displace six residences and one business. Its compatibility with area land use plans would be similar to Bypass Alternative 4A.

Visually, this bypass would be in a location similar to Bypass Alternative 4A, but would use more bridges. A revegetation plan is proposed as mitigation. Features of this alternative include the new pavement surface, eight bridges, vegetation clearing, cut-and-fill slopes, and four retaining walls measuring up to 60 feet (18.3 meters) in height and as long as 700 feet (213 meters) on both the west and east sides of the road. Like 4A, the impact of the roadway would worsen as it gets closer to the Blue Ridge Parkway. The impacts on views from Thunderhill overlook would not be as substantial as with Bypass Alternative 4A. The impacts would remain, however, great enough to constitute an adverse effect on the Blue Ridge Parkway from a historic resources perspective.

The introduction of bridges to create Bypass Alternative 4B would reduce the impact to 20 streams crossed (14 would be bridged) and would use 38 acres of natural plant communities. Habitat fragmentation would also be reduced. While following a path similar to that of Bypass Alternative 4A, implementation of Bypass Alternative 4B would result in substantially less plant community impact and fragmentation because of extensive use of bridges.

Bypass Alternative 4B would be the most expensive alternative with a cost of \$250 million. The cumulative community and natural resource impacts of Bypass Alternative 4B would be essentially the same as Alternative 4A.

7. Use of Resources Protected by Section 4(f) of the Department of Transportation Act of 1966

Since the Widening Alternative would use land from the Green Park Historic District, Section 4(f) of the Department of Transportation Act of 1966, as amended, (49 U.S.C. 303) applies to this alternative. The four bypass alternatives would not use Section 4(f) resources. Section 4(f) states that the US Department of Transportation may not approve the use of land from a significant publicly owned public park, recreation area, wildlife, and waterfowl refuge, or any significant historic site unless a determination is made that:

- There is no feasible and prudent alternative to the use of land from the property; and
- The action includes all possible planning to minimize harm to the property resulting from such use.

An alternative is feasible if it is buildable. An alternative is considered not prudent only if it involves "truly unusual factors" or "unique problems" or the cost of community disruption reaches "extraordinary magnitudes." (<http://nepa.fhwa.dot.gov/ReNepa>) The feasibility and prudence of alternatives that meet the purpose and need of the US 321 improvements project and that avoid Section 4(f) resources will be determined based on a combination of the severity of construction and long-term impacts, safety, traffic service provided, and cost. Both the impact assessment contained in the DEIS and DEIS review comments will be considered when making this decision. This decision will be made by the FWHA and will be presented in the Final Environmental Impact Statement.

8. Areas of Controversy

During the process of project scoping, interagency involvement, and citizen participation, the principal issues of concern were:

- The appropriateness of placing a four-lane road through a historic district and a resort community (Blowing Rock), given the disruption caused by the construction period and the permanent community and visual change associated with a four-lane road.
- The appropriateness of leaving increasing through-traffic volumes on a widened US 321 in Blowing Rock, particularly since traffic could grow to the point where a bypass around Blowing Rock would be needed anyway.
- The appropriateness of the presence of a four-lane thoroughfare anywhere within the Town of Blowing Rock.
- The appropriateness of placing a four-lane bypass through a rural and natural environment, given that there is an improvable existing road that serves the same traffic.
- The appropriateness of placing a new thoroughfare within the viewshed of a valued view from the Blue Ridge Parkway.

These concerns are addressed in this DEIS.

9. Major Unresolved Issues with Other Agencies

One major unresolved issue with other agencies is that they did not concur with the NCDOT's and the FHWA's decision to evaluate Bypass Alternatives 4A and 4B in the DEIS.

10. Other Federal Actions Required for the proposed Project

A US Army Corps of Engineers Dredge and Fill Permit would be required with any of the alternatives. No other federal actions would be required.

ENVIRONMENTAL COMMITMENTS

The NCDOT commits to conduct the following additional studies and carry out certain tasks in order to minimize potential impacts identified throughout the DEIS. These commitments are as follows:

1. Project Development and Environmental Analysis, Roadside Environmental Unit, Roadway Design Unit, Division 11 Right-of-Way Office and Division 11 Office
 - As a part of a continued agency coordination program, final design plans and a final landscape or revegetation plan will be prepared for the preferred alternative with input from local officials, natural resource agencies, the State Historic Preservation Officer (SHPO), the Advisory Council of Historic Places (ACHP), and the National Park Service.
 - An integrated utility relocation plan will be prepared for the Widening Alternative if it is selected as the preferred alternative.
2. Project Development and Environmental Analysis Branch
 - A survey will be conducted for the Heller's blazing star, a protected species, in the corridor of the preferred alternative.
 - A Memorandum of Agreement will be developed between the FHWA, the NCDOT, the SHPO, the ACHP, and National Park Service for mitigating effects for the preferred alternative, if one is selected that has an adverse effect on a historic resource listed on or eligible for inclusion in the National Register of Historic Places. Development of the agreement will consider input from other consulting parties.
3. Project Development and Environmental Analysis, Roadway Design Unit, Geotechnical Unit, Human Environment Office
 - A construction and traffic management plan will be prepared that includes a contractor incentive program, a public outreach program, a blasting control program, and other techniques to help minimize construction period impacts. Input will be solicited from the Town of Blowing Rock, Caldwell and Watauga Counties, and the National Park Service.