

## NC 209 IMPROVEMENTS

From west of SR 1801 (Liner Cove Rd.) to just north of SR 1523 (Old Clyde Rd.), Lake Junaluska, Haywood County

WBS Element 34599.1.1  
Federal Project No. STP-209 (2)  
State Project No. 8.1944301

### TIP PROJECT R-4047

#### ADMINISTRATIVE ACTION ENVIRONMENTAL ASSESSMENT

U. S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
AND  
N. C. DEPARTMENT OF TRANSPORTATION

submitted pursuant to 42 U.S.C. 4332(2) (c)



#### APPROVED:

3/10/08  
Date

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Federal Highway Administration

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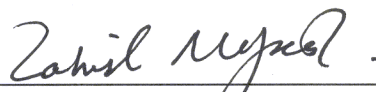
## TIP PROJECT R-4047

## ENVIRONMENTAL ASSESSMENT

March 2008

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# **PROJECT COMMITMENTS**

## **NC209 IMPROVEMENTS**

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## **TIP PROJECT R-4047**

### **PDEA (Natural Environmental Unit)**

In addition to the Individual Nationwide Permit Conditions, Section 404 Nationwide Permit, State Stormwater Permit, Section 401 Water Quality Certification (WQC) Conditions, Regional Conditions, State Consistency Conditions, NCDOT's *Best Management Practices for Protection of Surface Waters* (March 1997), NCDOT's *Best Management Practices for Construction and Maintenance Activities* (August 2003), and General Certification Conditions, the following special commitments were agreed to by NCDOT:

### **GeoEnvironmental Section**

Based on field reconnaissance and a database search, five (5) sites were identified that could pose environmental concerns for the proposed project. Out of five sites, only one is an active gas station and four former underground petroleum storage tank sites. All USTs have been removed from the four former UST sites.

The Geographical Information Service (GIS) was consulted for the project corridor. The research showed no regulated or unregulated landfills or dumpsites occurred within the project limits. If further design studies indicate right of way from subject properties is to be acquired, preliminary site assessments for soil and groundwater contamination will be performed prior to right of way purchase.

## **Hydraulics Unit**

Stormwater drainage will be controlled and not shunted directly into the existing stream channels.

## **Division 14**

Bridge No. 32 is a railroad trestle that is 197 ft long and 9.0 ft wide, Bridge demolition will occur by removing the steel beams and steel pile piers. The bridge components will be removed without dropping them into UT 3. Consequently, there will be no temporary fill resulting from bridge demolition.

All concrete used for the construction of bridges and culverts will be allowed to cure before making contact with streams or river.



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## **NC209 IMPROVEMENTS**

From west of SR 1801 (Liner Cove Rd.) to just north of SR 1523 (Old Clyde Rd.), Lake Junaluska, Haywood County

WBS Element 34599.1.1  
Federal Project No. STP-209(2)  
State Project No. 8.1944301

### **TIP PROJECT R-4047**

#### **SUMMARY**

A. Type of Action

This is a Federal Highway Administration (FHWA) Administrative Action, Environmental Assessment (EA).

B. Description of Action

NCDOT proposes to improve NC 209 from west of the SR 1801 (Liner Cove Rd.) to just north of SR 1523 (Old Clyde Road). The build alternative will consist of widening NC 209 to a four-lane divided facility with a raised median from SR 1801 (Liner Cove Road) to SR 1523 (Old Clyde Road). Improvements to US 23 Business south of Liner Cove Road and NC 209 North of SR 1523 (Old Clyde Road) will be made to facilitate the transition from the four lane divided facility to the two lane facility. (Appendix A Figure 1)

NC 209 will also be realigned from SR 1526 (Carley Road) to SR 1523 (Old Clyde Road). The project also proposes to reconfigure ramps at the US 19-23-74/US 23 Business/NC 209 interchange. The proposed project will also replace railroad structure R-32, which carries the Norfolk Southern Railway tracks over NC 209. The improvements proposed by the project will reduce congestion, and improve access within the project study area.

The proposed project is included in NCDOT's approved 2007-2013 Transportation Improvement Program (T.I.P.) with right-of-way acquisition is scheduled to begin in Federal Fiscal Year (FFY) 2009 and construction is scheduled to begin in FFY 2011. The preliminary right-of-way and construction costs for the NCDOT-preferred alternative, which involves widening NC 209 to a four-lane raised median facility and modifying the existing NC 209/US 19-23-74/US 23 Business interchange is \$9,645,000 and \$24,400,000 respectively.

### C. Summary of Purpose and Need

The purpose of the project is to reduce congestion and improve access to homes, businesses, and public facilities in the area. The proposed improvements will complete the improvements to NC 209 started under TIP project R-2117, which acquired some right of way for the widening of the road.

### D. Alternatives Considered

#### 1. Build Alternative

NCDOT proposes to improve NC 209 from west of SR 1801 (Liner Cove Rd.) to north of SR 1523 (Old Clyde Road). The build alternative will consist of widening NC 209 to a four-lane divided facility with a raised median from the SR 1801 (Liner Cove Road) to SR 1523 (Old Clyde Road). Improvements to US 23 Business south of Liner Cove Road and NC 209 North of SR 1523 (Old Clyde Road) will be made to facilitate the transition from four lanes divided facility to the two lanes facility.

Currently the US 19-23-74 south on and off ramps, and SR 1375 (Access Road) share a common roadway and experience confusing traffic patterns resulting in traffic congestion and potentially unsafe conditions. The recommended build alternative will provide on and off-ramps for US19-23-74 separate from SR-1375 (Access Road). This will aid in reducing congestion and will improve access to homes and businesses in the area by separating local traffic from ramp traffic.

Also from north of SR 1801 (Liner Cove Road)/US 23 Business intersection to SR 1375 (Access Road) and US 19-23-74 South Ramp there are five intersections within a 1400 ft distance resulting in traffic congestion and difficulties in accessing nearby businesses and homes. The proposed improvements will reduce/combine the existing five intersections to only two signalized intersections. This will reduce congestion, traffic conflict points, and improve access to nearby homes and businesses.

The proposed improvements will also realign NC 209 from SR 1526 (Carley Road) to SR 1523 (Old Clyde Road). NCDOT also proposes to reconfigure the interchange of NC 209 at US 19-23-74. The existing ramp to connect US 19-23-74 (southbound) to US 23 Business will be realigned and reconfigured to allow left-turns to access NC 209 (north). SR 1929 (Hospital Drive) currently intersects NC 209 adjacent to the US 19-23-74 interchange. The project proposes to remove this connection to NC 209 and realign SR 1929 along new location and tie it into SR 1801 (Liner Cove Road). SR 1546 (Paragon Parkway) will be realigned to tie directly

into the intersection of NC 209 and the US 19-23-74 (southbound) on and off ramps.

The project will also replace rail structure R-32, which carries the Norfolk Southern Piedmont District's T-line. Construction of a new structure will result in the rail line being realigned to the south its existing location. The project will also close existing at-grade crossings of the Norfolk Southern rail line at SR 1526 (Carley Road).

## 2. Transportation System Management (TSM)

Transportation system management was considered for the project. However, the improvements would not have met the purpose and the need of the project. Transportation systems management strategies are low-cost but effective in nature, which include, but are not limited to:

- Intersection and signal improvement

Intersection and signal improvement alone would not address the purpose and need of the project. The intersections of NC 209 with SR 1929 (Hospital Drive) and SR 1646 (Paragon Parkway) are in close proximity and signal improvements will not reduce congestion or improve access to homes, businesses, and public facilities within the area. The proposed removal of the two adjacent signals at SR 1929 (Hospital drive) and SR 1446 (Paragon Parkway) will provide less conflict in traffic patterns and will improve the traffic flow.

- Freeway bottleneck removal programs

Additional capacity on US 19-23-74 will not address congestion issues along NC 209.

## 3. Alternative Modes of Transportation

Haywood County Transit provides bus and shuttle van service for the public use throughout the county. The service operates by appointment only and there are no fixed routes. The service at its current capacity does not address the congestion currently experienced along the NC 209-study corridor. Upgrades in service still would not improve access to private and public facilities within the study corridor.

Bicycle and pedestrian accommodations are not presently being used within the project boundaries. No transit system exists within the project area. These alternatives would not address the congestion currently experienced along the NC 209 study corridor and are not proposed as part of this project

#### 4. “Do Nothing” Alternative

If the proposed improvements to NC 209 and the US 19-23-74/US 23 Business/ NC 209 interchange are not made, the entire project study area will continue to experience considerable congestion. The project study area currently has an accident rate that is nearly six times the state rate for comparable facilities. If no improvements are made, there will be no reduction in congestion and no access improvement to homes, business, and public facilities in the area. Therefore, NCDOT does not recommend implementation of the no-build alternative

#### E. NCDOT Preferred Alternative

The NCDOT-preferred alternative is the build alternative. The build alternative will address the congestion issues experienced within the project study corridor. The proposed improvements will also decrease congestion and improve access to the businesses and residences adjacent to the project study corridor.

#### F. Summary of Environmental Impacts

The environmental impacts associated with the proposed project are detailed in Section V of this document. The following table summarizes the environmental impacts.



RESOURCE	SUMMARIZING IMPACTS
	Build Alternative (Four- Lane Divided Facility) NCDOT-Preferred
Archaeological	0
Architectural District/Properties	0/0
Total Stream Impacts	420 feet
Jurisdictional Wetland	0 acres
Endangered Species Community	0
Terrestrial Community Impacts	0 acres
Potential Hazardous Material Sites	5
Prime Farmland	0 acres
Section 4(f) Impacts	0
Schools	0
Churches	0
EJ Communities	0
Air Quality	No
Residential Relocations (Owners/Tenants)	9
Business Relocations (Owners / Tenants)	8
Critical Water Supplies	No
Total Cost	\$ 34,251,000

G. Anticipated Design Exceptions

There are no anticipated design exceptions anticipated for this project.

H. Permits Required

A section 404 Individual Permit will be required due to over 300 feet of cumulative streambank impacts. A North Carolina Division of Water Quality General Certification is required prior to the issuance of the Section 404 Individual Permit.

I. Coordination

The following federal, state, and local agencies were consulted during the preparation of this environmental assessment:

US Army Corps of Engineers (Asheville, NC Regulatory Field Office)\*  
US Environmental Protection Agency (Raleigh)\*  
US Fish and Wildlife Service (Asheville)\*  
Tennessee Valley Authority\*  
NC Dept. of Administration (State Clearinghouse)\*  
NC Dept. of Cultural Resources (Historic Preservation)\*  
NC Dept. of Public Instruction (School Planning)\*  
NC Dept. of Environment & Natural Resources\*  
NC Wildlife Resources Commission\*  
Haywood County Schools  
Community of Lake Junaluska

Written comments were received from agencies noted with an asterisk (\*). Copies of the 6 comments received are included in Appendix B.

J. Contact Information

The following persons can be contacted for additional information concerning the proposal and assessment:

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## NC 209 IMPROVEMENTS

From west of SR 1801 (Liner Cove Rd.) to just north of SR 1523 (Old Clyde Rd.)

WBS Element 34599.1.1  
Federal Project No. STP-209 (2)  
State Project No. 8.1944301

### TIP PROJECT R-4047

#### I. DESCRIPTION OF PROPOSED ACTION

##### A. General Description

NCDOT proposes to improve NC 209 from west of SR 1801 (Liner Cove Road.) to just north of SR 1523 (Old Clyde Road). This alternative will consist of widening NC 209 to a four-lane divided facility with a raised median from SR 1801 (Liner Cove Road) to SR 1523 (Old Clyde Road). Improvements to US 23 Business west of Liner Cove Road and NC 209 North of SR 1523 (Old Clyde Road) will be made to facilitate the transition from four lanes divided facility to the two lanes facility. The project will also reconfigure the ramps in the US 19-23-74/US 23 Business/NC 209 interchange. The proposed Improvement will realign portions of NC 209, SR 1929, and SR 1375. This will also replace bridge # R-32 and realign the Norfolk Southern Railway T-line over NC 209 (Appendix A figure 3). The total project length is 0.77 Miles.

##### B. Project Status

Project R-4047 is included in NCDOT's approved T.I.P. 2007-2013 Transportation Improvement Program (TIP). The project is scheduled for right of way acquisition in Fiscal Year (FFY) 2009 and construction in FFY 2011.

##### C. Cost Estimates

**Table 1 Cost Estimates**

<b>Approved 2007 – 2013 TIP Estimate</b>			
<b>Construction</b>	<b>Right of Way</b>	<b>Mitigation</b>	<b>Total Cost</b>
\$10,200,000	\$600,000	\$115,000	<b>\$10,915,00</b>
<b>Current Project Cost Estimate (Build Alternative)</b>			
<b>Construction</b>	<b>Right of Way</b>	<b>Mitigation</b>	<b>Total Cost</b>
\$24,400,000	\$9,645,000	\$206,000	<b>\$34,251,000</b>

## II PURPOSE AND NEED FOR THE PROJECT

### A. Purpose of Project

The purpose of the project is to reduce congestion and improve access to homes, businesses, and public facilities in the area. The proposed improvements will complete the improvements to NC 209 started under T.I.P R-2117, which acquired some right of way for the widening of the road.

### B. Need for Project

#### 1. Description of Existing Conditions

##### a. Functional Classification

NC 209 is classified as a major collector on the North Carolina Highway Functional Classification System.

##### b. Physical Description of Existing Facility

#### 1. Roadway Cross-Sections

NC 209 in the vicinity of US 19-23-74 (Great Smokey Mountain Expressway) is a four to five-lane undivided facility with curb and gutter. As NC 209 continues north along the project corridor, it becomes a two-lane undivided facility with a 12-foot lane in each direction and 4-foot grass shoulders (Appendix A figure 2).

#### 2. Horizontal and Vertical Alignment

The current vertical and horizontal alignments of existing roads within the project limits of the proposed project are poor. The new alignment will follow the existing alignment in most of the project limits. In the vicinity of railroad structure R-32, NC 209 will be realigned in order to accommodate the proposed widening.

#### 3. Right of Way

The existing right of way width varies throughout the project study corridor. Additional right of way will be necessary to accommodate propose widening of NC 209. It is estimated that fifty-three parcels will be affected by this project. Nine residence and eight businesses will be relocated due to the widening of this NC 209 project.

#### 4. Access Control

Control of access exists in the vicinity of the US 19-23-74/US 23 Business/NC 209 interchange. Beyond the interchange area, NC 209 does not have control of access. Major intersections are at grade and adjacent residences and businesses have driveway access.

#### 5. Speed Limits

NC 209 has a posted speed limit 40 of mph from north of US 23 Business to a point 0.12 miles north of SR 1523 (Old Clyde Road). The speed limit is 45 mph from a point 0.12 miles north of SR 1523 (Old Clyde Road) to a point 1.04 miles north of SR 1523 (Old Clyde Road).

#### 6. Intersections and Type of Control

Within the project limits, NC 209 is a two-lane facility with at-grade intersections. Signals are used to control traffic at the intersections of NC 209 at the US 19-23-74 (northbound) off/on-ramps, SR 1646 (Paragon Parkway) and SR 1929 (Hospital Drive). Due to the low traffic volumes at other at-grade intersections, stop signs are used to control traffic.

#### 7. Railroad Involvement

The Norfolk Southern Railway Piedmont Division's T-line crosses NC 209 on bridge number R-32. TIP Project R-4047 proposes to replace this structure due to the realignment of NC 209. The T-line runs from Asheville to Sylva and is used by approximately 2 – 3 freight trains per day. The maximum allowable train speed at this location is 15 miles per hour due to the steep grades and high degree of radius in the area.

NCDOT proposes to realign the rail line south of the existing location and construct a new structure to replace bridge # R-32 (see figure 3). The NCDOT also proposes to close one at-grade rail crossing within the project study area. The crossing closure is located along SR 1526 (Carley Road).

#### 8. Structures

Railroad structure R-32 currently carries the Norfolk Southern Railway Piedmont Division's T-line over NC 209. NCDOT proposes to replace the structure with a new structure due to the widening and realignment of NC 209. Bridges #121 and #122 carry

US 19-23-74 over NC 209. There are currently no plans to replace either of these bridges.

The existing 8ft by 6ft reinforced concrete box culvert (RCBC) is to be retained and extended. There will be a new crossing of UT3, which will also require a new 8ft by 6ft RCBC.

Table 1a lists existing structural information along the project.

**Table 1a. Structural Inventory**

Bridge Number	Facility Carried	Bridge Length (ft)	Bridge Width (ft)	Sufficiency Rating	Remaining Life (Years)
#121	US 19-23-74 North over NC 209	155	48.1	79.0	22
# 122	US 19-23-74 South over NC 209	155	48.1	79.0	22
N/A	8X6 RCBC under SR-1375 (Access Rd.)	Existing 8X6 Reinforced Concrete Box Culvert is to be retained and extended.			
# R32	NS R.R. over NC 209	Owned by Norfolk Southern Railway			

9. Greenway, Pedestrian, and Bicycle Considerations

There are no greenways within the project study area nor are there any sidewalks within the project corridor. NC 209 is not designated as a bicycle route nor does it correspond to a bicycle TIP request.

10. Utilities

The Project contains both above ground and sub-surface utilities over good portion of project. Power, telephone and cable television are all carried on utility poles. A total of twenty-five power poles, fifteen light poles and two cable telephone poles need to be relocated. Furthermore water and sewer lines will need to be relocated to accommodate the widening of the NC 209.

## 11. Geodetic Markers

The project may impact two geodetic survey markers. The N.C. Geodetic Survey will be contacted prior to construction regarding the location of the survey markers. Intentional destruction of a geodetic monument is a violation of the N.C. General Statute 102-4.

### c. School Bus Usage

Approximately forty-five (45) school buses pass through the project study area daily. School buses that utilize the project corridor serve Tuscola High School, Waynesville Middle School, Junaluska Elementary School, and Clyde Elementary school.

### d. Traffic Carrying Capacity

Traffic volumes for the years 2006 and 2030 were determined to quantify existing and future traffic demands within the project area. The “no build” alternative is for the current configuration of the US 19-23-74 and NC 209 (Crabtree Road). The “build” alternative assumes re-configuration of the US 19-23-74 and NC209 interchange, and realignment of SR 1646 (Paragon Parkway), SR1929 (Hospital Drive) and SR1927 (Tuscola Road). Currently, the “No build” alternative average annual daily traffic (AADT) at the northern project limit is 9,400 Vehicles per day (vpd). At the southern project limit, the base year traffic volume is 20,500 vpd. (Appendix – E, Base Year “No Build” Page 1-4)

Level of service (LOS) is a qualitative measure describing operational conditions within a traffic stream and how motorists and/or passengers perceive these conditions. A LOS definition generally describes these conditions in terms of speed, travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Six LOS, letter designations from A (Best) to F (Worst) represent operations for each type of facility for which analysis procedures are available.

The Highway Capacity Manual, Third Edition (Transportation Research Board Special Report 209, 1997) and HCS2000 traffic analysis software were utilized to determine the 2006 and 2030 level of service.

## CAPACITY ANALYSIS RESULTS

The “no build” projection for year 2030 the average annual daily traffic (AADT) at the northern project limit is 13700 (vpd). At the southern project limit, the project design year volume is 29,200. (Appendix – E, Future Year “No Build” Page1-4)

The “build” projected volume for design year 2030 at the northern project limit is 13,700. At southern project limit, the projected design volume is 31,900 vpd. (Appendix – E, Future Year “Build” Page 1-4)

The no build main line analysis is based on a design speed limit of 45 miles per hour and a two-lane typical section, the existing NC 209 is expected to operate at LOS E in 2006 and LOS F in 2030, along heaviest traveled section.

The build alternative assumes re-configuration of the US 19-23-74 & NC 209 interchange, and realignment of SR 1646 (Paragon Parkway) and the School Bus Entrance in 2030. The upgraded NC 209 is expected to operate at LOS C from SR 1523 (Old Clyde Road) to SR 1375 (Access Road) and from north of SR 1801(Liner Cove Road) to school bus Entrance in 2030. The segment of NC 209 between the US 19-23-74 Northbound and Southbound interchange ramp intersections is expected to operate at LOS F in 2030.

The build scenario proposes three signalized intersections and nine un-signalized intersections. The following section provides a discussion of each individual intersection analysis. NCDOT Capacity Analysis guidelines are attached in Appendix F.

#### NC 209 & SR 1523 (Old Clyde Road) - Signalized

Given the existing geometry, this intersection currently operates at LOS A. Without changes to the existing roadway, the intersection is expected to operate at LOS F in 2030. This intersection will be improved with the addition of a turn lane. Based on the proposed built geometry, this intersection is expected to operate at LOS B in 2006 and at LOS C in 2030.

#### NC 209 & Haywood Office Park Entrance - Unsignalized

Given the existing geometry the eastbound approach currently operates at LOS E. Without changes to the existing roadway, the eastbound approach is expected to operate at LOS F in 2030. This intersection will be realigned to connect with Haywood Office Park Entrance as part of the project improvements.

#### NC 209 & SR 1375 (Depot Road) – Unsignalized

Given the existing geometry the eastbound approach currently operates at LOS F. Without changes to the existing roadway, the eastbound approach is expected to operate at LOS F on 2030. Based on the proposed build geometry, the eastbound approach is expected to operate at LOS D in 2006 and at LOS F on 2030.



#### SR 1375 (Depot Road) & SR 1376 (County Road) – Unsignalized

Given the existing geometry the eastbound approach currently operates at LOS B. Without changes to the existing roadway, the eastbound approach is expected to operate at LOS B in 2030. No intersection improvements are proposed at this location in the future. The southbound approach is expected to operate at LOS B in 2006 and 2030.

#### NC 209 & SR 1526 (Carley Road) – Unsignalized

Given the existing geometry, the westbound approach currently operates at LOS F. Without changes the existing roadway, the westbound approach is expected to operate at LOS F in 2030. This intersection will be restricted to right-in right-out movement as part of the project improvement. Based on the proposed build geometry, the westbound approach is expected to operate at LOS B in 2030.

#### NC 209 & SR 1375 (Access Road) – Unsignalized

Given the existing geometry, the eastbound approach currently operates at LOS F. without changes to the existing roadway, the eastbound approach is expected to operate at LOS F in 2030. Based on the proposed build geometry, the eastbound approach will operate at LOS E in 2006 and at LOS F in 2030.

#### SR 1375 (Access Road) & US 19-23-74 Ramp – Unsignalized

Given the existing geometry, the westbound approach currently operates at LOS C. Without changes to the existing roadway, the westbound approach is expected to operate at LOS F in 2030. This intersection will be eliminated and the US 19-23-74 southbound ramp will be realigned with the NC 209/SR 1626 intersection as part of the project improvement.

#### NC 209 & SR 1646 (Paragon Parkway) & US 19-23-74 SB Ramp – Signalized

Given the existing geometry, the intersection currently operates at LOS E. Without changes to the existing roadway, the eastbound approach is expected to operate at LOS F in 2030. This intersection will be realigned to include all the US 19-23-74 SB ramp vehicles as part of the project improvements. Currently, vehicles desiring to travel north and west of the interchange have the exit onto SR 1375 (Access Road). The newly realigned interchange ramp will tie in directly across from SR 1646 (paragon Parkway) to form a four-way signalized intersection. Vehicles desiring to travel north and west will have direct access to NC 209. Vehicles desiring to travel south and east will use the southbound loop

ramp. Based on the proposed build geometry, the eastbound approach will operate at LOS D in 2006 and at LOS F in 2030.

SR 1646 (Paragon Parkway) & Wal-Mart Entrance- Unsignalized

Given the existing geometry, the southbound approach currently operates at LOS F. Without changes to the existing roadway, the southbound approach is expected to operate at LOS F in 2030. No intersection improvements are proposed at this location in the future. The southbound approach is expected to operate at LOS F 2006 and 2030.

NC 209 & SR 1929 (Hospital Drive) – Signalized

Given the existing geometry, the intersection currently operates at LOS E. Without changes to the existing roadway, the intersection is expected to operate at LOS F in 2030. This intersection will be eliminated as part of the project improvement.

SR 1929 (Hospital Drive) & School Bus Access Road – Unsignalized

Given the existing geometry, the northbound approach currently operates at LOS B and is expected to operate at LOS C in 2030. No intersection improvements are proposed at this location.

SR 1929 (Hospital Drive) & SR 1927 (Tuscola Road) – Unsignalized

Given the existing geometry, the northbound approach currently operates at LOS F. Without changes to the existing roadway, the northbound approach is expected to operate at LOS F in 2030. Based on the proposed build geometry, the northbound approach to operate at LOS D in 2006 and at LOS F in 2030.

SR 1929 (Hospital Drive) & SR 1801 (Liner Cove) Unsignalized

Given the existing geometry, the northbound approach currently operates at LOS B. Without changes to the existing roadway, the northbound approach is expected to operate at LOS F in 2030. Based on the proposed build geometry, the northbound approach to operate at LOS F in 2006 and 2030.

SR 1801 (Liner Cove Road) & Lowe's Entrance – Unsignalized

Given the existing geometry, the eastbound approach currently operates at LOS B. Without changes to the existing roadway, the eastbound approach is expected to operate at LOS F in 2030. Based on

the proposed build geometry, the eastbound approach is expected to operate at LOS C in 2006 and 2030.

NC 209, US 19-23-74 NB Ramps, SR 1801 (Liner Cove Road) & US 23 Business – Signalized

Given the existing geometry, the intersection currently operates at LOS F. Without changes to the existing roadway, this intersection is expected to operate at LOS F in 2030. Based on the proposed build geometry, this intersection is expected to operate at LOS D in 2006 and at LOS F in 2030.

Tables 1b and 1c summarize intersection Level of Service for No Build and Build Scenarios.

**TABLE 1b. Intersection Level of Service for No Build Scenario**

INTERSECTION	APPROACH		2006 NO BUILD	2030 NO BUILD
NC 209 & Clyde Road	Signal		A	F
NC 209 & Haywood Park Entrance	NB	L	A	A
	EB	LR	E	F
NC 209 & Depot Road	NB	L	A	C
	EB	LR	F	F
Depot Road & County Road	EB	L	A	A
	SB	LR	B	B
NC 209 & Long Road	SB	L	A	A
	WB	LR	F	F
NC 209 Access Road	NB	L	B	F
	EB	LR	F	F
Access Road & US 19-23-74 SB Ramps	SB	L	A	A
	WB	LR	C	F
NC 209 & Paragon Pkwy/ US 19-23-74 SB Ramps	Signal		E	F
Paragon Pkwy & Wal-Mart Entrance	SB	LR	F	F
	EB	L	A	A
NC 209 Hospital Drive	Signal		E	F
Hospital Drive & School Bus Access Road	WB	L	A	A
	NB	LR	B	B
Hospital Drive & Tuscola Road	SB	L	A	A
	WB	LR	F	F
Hospital Drive Liner Cove Road	WB	L	A	A
	NB	LR	B	F
Liner Cove road & Lowe's Entrance	NB	L	A	A
	EB	LR	B	B
NC 209/US Business & US 19-23-74 NB Ramps/Liner Cove Road	Signal		F	F

**TABLE 1c. Intersection Level of Service for Build Scenario**

INTERSECTION	APPROACH		2006 BUILD	2030 BUILD
NC 209 & Old Clyde Road/Haywood Park Entrance	Signal		B	C
NC 209 & Depot Road	NB	L	B	C
	EB	LR	D	F
Depot Road & County Road	EB	L	A	A
	SB	LR	B	B
NC 209 & Long Road	WB	R	A	B
NC 209 Access Road	NB	L	B	C
	EB	LR	E	F
Access Road & US 19-23-74 SB Ramps	Signal		D	F
Paragon Pkwy & Wal-Mart Entrance	SB	LR	F	F
	EB	L	B	F
Hospital Drive & School Bus Access Road	WB	L	A	A
	NB	LR	B	C
Hospital Drive & Tuscola Road	SB	L	A	B
	WB	LR	D	F
Hospital Drive Liner Cove Road	WB	L	A	A
	NB	LR	F	F
Liner Cove road & Lowe's Entrance	NB	L	A	A
	EB	LR	C	C
NC 209/US Business & US 19-23-74 NB Ramps/Liner Cove Road	Signal		D	F

e. Accident Data and Analysis

During a three year period between December 1, 2004 and March 31, 2007, a total of 52 crashes were reported along the project corridor. Approximately, 85% of all crashes within the project study corridor occurred between US-19-23-74 and the intersection of SR 1375. Left turns accounted for 60% of all crashes. This was followed by rear end (21%) and sideswipe crashes (6%) as shown in Figure 4. The total crash rate within the project study corridor is 1052.08 accidents per 100 million vehicle miles traveled (mvmt). This rate is significantly higher than the statewide crash rate for rural NC routes, which were 191.04 accidents per 100 mvmt from 2003 to 2005.

A comparison of the rates for different crash types on NC 209 versus other NC rural undivided highways in North Carolina is shown in Table 1d.

**Table 1d. Crash Rates (per 100 million vehicle miles)**

Crash Rate	NC 209	Statewide Average NC Rural Undivided Highways*
Total Rate	1052.08	191.04
Fatal Crash Rate	0	2.24
Non-Fatal Crash Rate	485.57	73.98
Night Crash Rate	101.16	63.99
Wet Crash Rate	101.16	33.32
*2003 – 2005 Crash Rates		

**Table 1e. Crash Type Summary**

Crash Type	Number of Crashes	Percent of Total
Fixed Object	4	7.69
Left Turn, Different Roadways	4	7.69
Left Turn, Same Roadway	27	51.92
Overtum / Rollover	1	1.92
Rear End, Slow or Stop	11	21.15
Right Turn, Different Roadways	1	1.92
Right Turn, Same Roadway	1	1.92
Sideswipe, same direction	3	5.77
12/01/2004 – 03/31/2007		

f. Airports

Asheville Regional Airport is located approximately 32 miles from the project study area. The airport provides passenger and general aviation services.

2. Thoroughfare Plan and System Linkage

Currently, there is no thoroughfare plan for Haywood County or the unincorporated community of Lake Junaluska. NC 209 is classified as a major collector on the North Carolina Highway Functional Classification System. Collectors provide a lower degree of mobility than arterials. They are designed

for travel at lower speeds and for shorter distances. The improvements to NC 209 in conjunction with the improvements made to NC 209 under TIP # R-2117 will provide an improved connection between US 19-23-74 at Lake Junaluska, Waynesville, and I-40 towards Knoxville, Tennessee.

C. Benefits of Proposed Project

NCDOT proposes to improve NC 209 from west of SR1801 (Liner Cove Road) to north of SR 1523 (Old Clyde Road). This alternative will consist of widening NC 209 to a four-lane divided facility with a raised median from the SR 1801 (Liner Cove Road) to SR 1523 (Old Clyde Road). Improvements to US 23 Business west of Liner Cove Road and NC 209 North of SR 1523 (Old Clyde Road) will be made to facilitate the transition from four lanes divided facility to the two lanes facility. The project will also reconfigure the ramps in the US 19-23-74/US 23 Business/NC 209 interchange, and reduce the number of intersections along NC 209. Railroad structure R-32, which carries the Norfolk Southern Railway tracks over NC 209 will be replaced and the Railway T-line over NC 209 will be re-aligned. The improvements proposed by the project will reduce congestion and improve access to homes, businesses, and public facilities in the area.

### III. ALTERNATIVES CONSIDERED

#### A. General

The North Carolina Department of Transportation (NCDOT) and Federal Highway Administration (FHWA) propose to upgrade NC 209 to a four-lane divided with a raised median from west of US 19-23-74 to north of SR 1523 (Old Clyde Road). NC 209 will also be realigned from SR 1526 (Carley Road) to SR 1523 (Old Clyde Road). The project also proposes to reconfigure ramps in the US 19-23-74/US 23 Business/NC 209 interchange. The proposed project will also remove the at-grade railroad crossing SR 1526 (Carley Road). The project will replace railroad structure R-32, which carries the Norfolk Southern Railway tracks over NC 209 and realign the railroad tracks immediately south of rail structure R-32.

#### B. Build Alternatives

The NCDOT-preferred alternative consists of widening NC 209 to a four-lane divided facility with a raised median throughout the project study corridor (See Appendix A figure 3). The proposed improvements will also realign NC 209 from SR 1526 (Carley Road) to SR 1523 (Old Clyde Road). NCDOT also proposes to reconfigure the interchange of NC 209 at US 19-23-74. The existing ramp to connect US 19-23-74 (southbound) to US 23 Business will be realigned and reconfigured to allow left-turns to access NC 209 (north).

Currently, traffic from NC 209 and US 23 Business access US 19-23-74 (southbound) via an access road (SR 1375). SR 1375 is a two-way street that provides access to adjacent businesses as well as US 19-23-74 (southbound). SR 1375 will be realigned and the connection to US 19-23-74 (southbound) will be via a direct on-ramp. SR 1929 currently intersects NC 209 adjacent to the US 19-23-74 interchange. The project proposes to remove this connection to NC 209 and realign SR 1929 along new location and tie it into SR 1891 (Liner Cove Road). SR 1646 (Paragon Parkway) will be realigned to tie directly into the intersection of NC 209 and the US 19-23-74 (southbound) off and on ramps.

TIP Project R-4047 also proposes to replace rail structure R-32, which carries the Norfolk Southern Piedmont District's T-line. Construction of a new structure will result in the rail line being realigned to the south of its existing location. The project will also close existing at-grade crossings of the Norfolk Southern rail line along SR 1526 (Carley Road).

#### C. Typical Section Alternatives

NC 209 will have a varied cross-section within the project study area. In the vicinity of the US 19-23-74 southbound ramp and SR 1646 (Paragon Parkway) intersection, NC 209 will be a four-lane divided with exclusive left and

right turn lane. In the vicinity of the US 19-23-74 northbound ramp and SR 1801(Liner Cove Road), NC 209 south will be four- lane divided with exclusive dual left lanes towards SR 1801(Liner Cove Road) and one right lane. As the facility approaches the northern project limit, it transitions to a two-lane facility.

#### D. Transportation System Management (TSM)

Transportation system management was considered for the project. However, the improvements would not have met the purpose and the need of the project. Transportation systems management strategies are low-cost but effective in nature, which include, but are not limited to:

- Intersection and signal improvement

Intersection and signal improvement alone would not address the purpose and need of the project. The intersections of NC 209 with SR 1929 (Hospital Drive) and SR 1646 (Paragon Parkway) are in close proximity and signal improvements will not reduce congestion or improve access to homes, businesses, and public facilities in the area. The proposed removal of the two adjacent signals at SR 1929 (Hospital drive) and SR 1446 (Paragon Parkway) will provide less conflict in traffic patterns and will improve the traffic flow.

- Freeway bottleneck removal programs

Additional capacity on US 19-23-74 will not address congestion issues along NC 209.

#### E. Alternative Modes of Transportation

Haywood County Transit provides bus and shuttle van service for the public use throughout the county. The service operates by appointment only and there are no fixed routes. The service at its current capacity does not address the congestion currently experienced along the NC 209 study corridor. Upgrades in service still would not improve access to private and public facilities within the study corridor.

#### F. “Do Nothing” Alternative

If the proposed improvements to NC 209 and the US 19-23-74/US 23 Business/ NC 209 interchange are not made, the entire project study area will continue to experience considerable congestion. The project study area currently has an accident rate that is nearly six times the state rate for comparable facilities. If no improvements are made, there will be no reduction in congestion and no improvement in travel times. Therefore, NCDOT does not recommend implementation of the no-build alternative



## G. NCDOT Preferred Alternative

The NCDOT-preferred alternative is the build alternative. The build alternative will reduce congestion and improve access to homes, businesses, and public facilities within the project study area.

Currently, the horizontal alignment along NC 209 from SR 1526 (Carley Road) to SR 1523 (Old Clyde Road) provides poor sight distance, substandard curve radii and driver discomfort and over reaction. The proposed improvements will correct geometric deficiencies and reduce congestion along NC 209.

In addition, from north of SR 1801 (Liner Cove Road)/US 23 Business intersection to SR 1375 (Access Road) and US 19-23-74 South Ramp there are five intersections within a 1400 ft distance resulting in traffic congestion and difficulties in accessing nearby businesses and homes. The proposed improvements will reduce/combine the existing five intersections to only two signalized intersections. The intersection at NC 209 and SR 1929 (Hospital Drive) will be eliminated. The intersection at NC 209 and SR 1646 (Paragon Parkway) will be realigned with the US 19-23-74 SB ramp as part of the project improvements. Currently, vehicles desiring to travel north and west of the interchange have the exit onto SR 1375 (Access Road). The newly realigned interchange ramp will tie in directly across from SR 1646 (Paragon Parkway) to form a four-way signalized intersection. Vehicles desiring to travel north and west will have direct access to NC 209. Vehicles desiring to travel south and east will use the southbound loop ramp. This will reduce congestion, traffic conflict points, and improve access to nearby homes and businesses.

Presently, Haywood Park entrance is an un-signalized intersection and operates at LOS E. This intersection will be realigned with SR 1523 (Old Clyde Road) and will be signalized. This will reduce congestion and improve access to the businesses and public facilities in the Haywood Park area.

The build alternative will improve traffic flow and LOS along most intersections; will reduce congestion along NC 209 and US19-23-74 interchange, and reduce traffic conflict points.

#### IV. DESCRIPTION OF PROPOSED IMPROVEMENTS

A. Length of Project

The total length for the proposed project is approximately 0.777 miles.

B. Typical Section

The build alternative proposes to upgrade NC 209 within the study area to a four lane divided raised median facility.

C. Structures

The project proposes to dismantle bridge #R 32 and replace it with a new structure. The new structure will accommodate the realigned and widened NC 209 in the vicinity of the Norfolk Southern Railway Bridge. No additional structures are proposed to be or improved.

D. Traffic Control during Construction

Traffic will be maintained on site during construction. Railroad structure No. 32 will be replaced with new Railroad Bridge over the NC 209. The existing bridge will be used to service rail traffic during construction new Railroad Bridge span. Upon completion of the new Bridge, rail traffic will be diverted and old structure will be dismantled

E. Right of Way

NCDOT owns right of way with variable width along the project corridor. Additional right of way will be purchased to accommodate the widened NC 209. Additional right of way will also have to be purchased to accommodate the realignments of SR 1375(Access Road), SR 1526(Carley Road) SR 1646 (Paragon Parkway), SR 1801(Liner Cove Road), and SR 1929 (Hospital Drive).

Temporary construction easements on both sides of the project may also be required. Permanent drainage easements may be required in some areas along the proposed project.

F. Intersection Treatment and Type of Control

NCDOT proposes to reconfigure the interchange of NC 209 at US 19-23-74. The existing ramp to connect US 19-23-74 (southbound) to US 23 Business will be realigned and reconfigured to allow left-turns to access NC 209 (north). Currently, traffic from NC 209 and US 23 Business access US 19-23-74 (southbound) via an Access Road (SR 1375). SR 1375 is a two-way street that

provides access to adjacent businesses as well as US 19-23-74 (southbound). SR 1375 will be realigned and the connection to US 19-23-74 (southbound) from NC 209 will be via a direct on-ramp.

SR 1929 currently intersects NC 209 adjacent to the US 19-23-74 interchange. The project proposes to remove this connection to NC 209 and realign SR 1929 along new location and tie it into SR 1891 (Liner Cove Road). SR 1646 (Paragon Parkway) will be realigned to tie directly into the intersection of NC 209 and the US 19-23-74 (southbound) off and on ramps. NC 209 and SR 1523(Old Clyde Road) intersection will be realigned to accommodate a stoplight and access to the NC 209 from Haywood Office Park will be reconfigured.

G. Sidewalks/Bicycle Accommodations

The proposed project does not include plans for sidewalks or bicycle accommodations. Through coordination with the public and local officials, the need for such accommodations has not been identified. Due to the nature of the proposed improvements to US 74, accommodations for pedestrians and bicyclist along the project will not be included.

H. Access Control

Access control will be maintained along NC 209 in the vicinity of the US 19-23-74 interchange. NCDOT does not propose controlling the access along NC 209 outside of the interchange area.

I. Design Speed and Proposed Posted Speed Limit

The proposed project will have a minimum design speed of 30 miles per hour (mph) throughout the project study corridor. The anticipated-posted speed limit is 25 mph due to the alignment in the vicinity of the US 19-23-74 interchange.

J. Degree of Utility Conflicts

Utility conflicts along the proposed project are considered to be an average. Aerial lines carrying power, telephone and limited fiber optics cable run parallel to NC 209 for the entire length of the project. The sub-surface utilities consist of multiple sewer and water lines that need to be relocated during widening of the project

K. Airports

The proposed project will have no impact on the Asheville Regional Airport, which is located approximately 32 miles from the project study corridor.

L. Cost Estimates

The proposed project is included in NCDOT's Approved 2007-2013 Transportation Improvement Program (TIP). The TIP estimated costs and the total project construction costs are summarized in Table 2.

**Table 2. Preliminary Cost Estimates**

<b>Approved 2007 – 2013 TIP Estimate</b>			
Construction	Right of Way	Mitigation	<b>Total Cost</b>
\$10,200,000	\$600,000	\$115,000	<b>\$10,915,000</b>
<b>Current Project Cost Estimate (Build Alternative)</b>			
Construction	Right of Way	Mitigation	<b>Total Cost</b>
\$24,400,000	\$9,645,000	\$206,000	<b>\$34,251,000</b>

## **V. ENVIRONMENTAL EFFECTS OF PROPOSED ACTION**

### **A. Cultural Resources and Archaeological Resources**

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified as 36 CFR Part 800. Section 106 requires federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

The State Historic Preservation Office (SHPO) requested surveys for historic structures in their memo to NCDOT dated April 8, 2000. A field survey of the Area of Potential Effects (APE) was conducted in May 2000 by an NCDOT architectural historian and three structures over fifty years of age within the APE were recorded. The photographs of these properties along with their evaluations were shown to the SHPO in two meetings on July 20, 2000 and August 17, 2000. At those meetings SHPO staff concurred that all three properties were not eligible for the National Register and two forms were signed that reflects these findings. Therefore, there are no National Register-listed or National Register-eligible properties within the APE for this project. Copies of all correspondence are included in Appendix B.

Another survey of the above referenced project was requested by SHPO on March 19, 2001. Following clarification of the project APE in consultation with the NCDOT project engineer, a pedestrian inspection of the project area was carried out in March 2005. Consultation with staff of Western SHPO following the pedestrian survey of the project area resulted in issuance of a letter to the SHPO dated March 2, 2005. A letter for R-4047 issued by SHPO on June 6, 2005 recommended that no archaeological investigation be conducted in connection with this project.

### **B. LAND USE AND COMMUNITY IMPACTS ASSESSMENT**

#### **1. Community Characteristics**

##### **a. Geographic Location**

TIP Project R-4047 is located in the mountains of western North Carolina. The area is surrounded to the north by the Great Smokey Mountains, the Newfound Mountains to the east, the Pisgah Ridge and Blue Ridge Parkway to the south, and the Balsam Mountains to the west. Waynesville is the closest town to the project study area. The project actually lies within the unincorporated community of Lake Junaluska.

b. Land Use and Transportation Plan

The land use within the project study area consists of residential, commercial, and recreation facilities. Residential properties are primarily located adjacent to Lake Junaluska along SR 1375 (Depot Street) and south of the project corridor along SR 1801 (Liner Cove Road). Large commercial developments include Wal-Mart bordering SR 1646 (Paragon Parkway), Lowe's adjacent to US 23 Business (Asheville Road), and the Haywood Office Park, neighboring NC 209 at the northern project limit. Tuscola High School is located near the southeastern quadrant of the US 19-23-74 interchange.

Currently, there is not a land use or transportation plan for Haywood County. Zoning plans do not exist outside of the city limits of Waynesville, Clyde, and Canton. Also, there is not a thoroughfare plan for Haywood County. The unincorporated community of Lake Junaluska does not have a planning department.

c. Population and Demographic Characteristics

The Haywood County experienced a population growth of 15.1 percent between the 1990 and 2000 census. Lake Junaluska experienced a 7.8 percent increase in population between the two censuses.

The majority of the residents of the study area are of white origin. Additional ethnic groups are located within the project study area. Of those, Hispanics have shown the largest population increases from 1990 to 2000. The African-American population has seen continued decrease within the project study area.

**Table 3a. Population by Race and Demographic Origin**  
(2000 Census Data)

Population by Race and Demographic Origin	Haywood County		Demographic Study Area	
	Number	%	Number	%
Total Population	54,033		2,675	
White	52,330	96.6%	2,639	98.7%
Black or African-American	684	1.3%	10	0.37%
American Indian and Alaska Native	266	0.49%	7	0.26%
Asian	114	0.21%	3	0.11%
Hawaiian Native and Pacific Islander	20	0.04%	0	0
Hispanic or Latino	763	1.4%	36	1.35%

19.01 percent of the population of Haywood County lies within the 65 and older age group. 28.11 percent of Lake Junaluska's populations lies within 65 and older age bracket. The median age of the project study area is older than that of the state of North Carolina. The higher number of elderly citizens is indicative of the nature of the area as a retirement and resort community.

In Haywood County, 7.1 percent of households are below the poverty level. In Lake Junaluska 3.99 percent of the total households are below the poverty level. This percentage is consistent with a "well-off" retirement community. The median household income in Lake Junaluska is \$25,948.

## 2. Project Impacts

### a. Land Use

The proposed improvements to NC 209 are expected to be consistent with the existing land use patterns within the project study area. Currently, there are no land use plans for the project study area or Haywood County. Current land use includes large lot, residential development and large lot commercial development. Due to the lack of land use planning, ordinances are used to dictate development within the study area. The proposed improvements are not expected to result in the loss of farmland, increased development, or induced changes to current land use patterns.

### b. Economic Conditions

The proposed project is not expected to severely impact business within the project study area. The proposed improvements will result in nine residential and eight business relocations along the project area. This may impact the tax base and the property values within the study area. During construction, temporary detours may temporarily impede the flow of traffic along the study corridor and to businesses within the study area. The detour will only result in short-term impacts to the economic conditions of the area.

### c. Mobility and Access

The proposed improvements to NC 209 will improve traffic flow through the project study area. The inclusion of the raised median will restrict the left- turns but will improve the flow of the traffic on NC 209. The improvements to the US 19-23-74 interchange will benefit traffic heading to and from Lowe's, Wal-Mart, and Tuscola High School. Lowe's Home Improvement is located along US 23 Business (Asheville Road) immediately south of the US 19-23-74 interchange. Tuscola High School

is located southeast of project corridor and is currently connected to NC 209 via SR 1929. Access to the high school will be improved by the proposed realignment of SR 1929 to SR 1801 (Liner Cove Road). The on and off ramps of US 19-23-74 are located in the northwest quadrant of the interchange, and US 19-23-74 south is accessed via SR 1375. Also businesses align SR 1375 and residential areas adjacent to the Lake Junaluska utilize SR 1375. The project proposes to realign SR 1375 and reconfigure the on and off ramps from US 19-23-74. The improvements in the northwest quadrant will improve access to the neighboring business and the residences along SR 1375.

d. Safety

The proposed improvements should also result in lower accident rates within the project study area. The project is expected to improve safety by improving the ability of NC 209 to handle current and future traffic. Thus, reducing the congestion and the safety concerns associated with the facility not being able to accommodate the existing traffic. The improvements to NC 209 will also improve transportation for EMS and health service vehicles within the study area.

e. Provision of Public Services

Tuscola High School lies at the southern end of the project study area. The school experiences traffic back-ups from 7:20 a.m. to 8:00 a.m. and again from 2:45 a.m. and 3:45 p.m. Currently, 300 to 400 students drive to school each day. The existing traffic combined with the large number of student drivers creates a bottleneck during school day peak hours.

Lake Junaluska provides recreational boating and swimming. NC 209 provides access to the lake. The proposed improvements will not hinder access to Lake Junaluska.

The Junaluska Volunteer Fire Department and the Junaluska Post Office are located near the northern project limit along SR 1523 (Old Clyde Road). The communities surrounding the project study area are served by both facilities. Access to and by the services should only be hampered during the construction phase of the project. Upon completion of the proposed improvements, access to and by both services will be greatly improved, as more capacity is added and operational improvements to NC 209 are made.

A health service facility, a women's medical facility, and a vocational rehabilitation center are located within the Haywood Office Park. The proposed improvements to NC 209 are not expected to impact



the Haywood Office Park. The upgraded NC 209 will improve accessibility to the facilities housed there.

f. Displacements

Additional right of way will be needed to construct the project. Temporary construction easement will also be required. Relocation report indicates that there will be nine residential and eight businesses will be relocated. None of the businesses are own by minorities. Out of eight businesses five are tenants.

For all relocations, it is the policy of the NCDOT to ensure that comparable replacement housing will be available prior to construction of State and Federally assisted projects. Appendix D contains Relocation Report.

3 Environmental Justice

One of the fundamental environmental justice principles is, “to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations or low-income populations.” The 2000 census data and field surveys indicate that the project study area does not include any low-income or minority communities. The proposed improvements will not adversely impact any environmental justice populations.

4. Indirect and Cumulative Effects

The northern portion of the project will occur on right-of-way acquired during the preliminary engineering phase of TIP Project R-2117. Therefore, impacts to adjacent properties should be minimal. New development within the project study area is not expected to occur due to the improvements to NC 209 as the project is only 0.77 miles and widen an existing road. The improvements are likely to increase the level of safety along the project corridor and increase the traffic carrying capacity of NC 209. Storm runoff is expected to continue to follow the existing topography and flow into Richland Creek. The project should not result in changes in the land use patterns within the project study area. The area surrounding the project study area is already well developed and the project does not offer new access to undeveloped land. Therefore, the indirect impacts of the project should be minor. The proposed improvements are not anticipated to result in changes to the visual quality of the project area.

## C. NATURAL RESOURCES

### 1. Physical Resources

#### a. Physiography, Topography, and Land Use

Haywood County lies in the Mountain Physiographic Province of North Carolina. Haywood County encompasses approximately 546 mi<sup>2</sup> and consists of gently rolling and steep topography within the North Carolina Blue Ridge Mountains. Elevations within the project vicinity range from approximately 2,585 to 2,650 ft above mean sea level (msl).

The French Broad River Basin encompasses 2,809 mi<sup>2</sup> (11% of the state) and contains the second longest linear distance of stream (4,113 mi) in North Carolina. The French Broad River Basin is composed of three major drainages; the French Broad, Pigeon, and Nolichucky Rivers, which all flow north into Tennessee. Water resources in this river basin support recreational-based businesses such as whitewater rafting, canoeing, and trout fishing. Many streams within the basin are classified as High Quality or Outstanding Resource Waters because of the abundant trout populations. Over fifty percent of the basin is forested with agricultural activities occurring primarily in river valleys. Cultivated land area is decreasing in this basin while urban lands are increasing. Major industries involve agriculture (dairy, livestock, apple orchards, and Christmas tree farms), mining, and tourism. Land uses within the project vicinity are comprised of maintained/disturbed land, urban residential/commercial areas, and forests.

#### b. Geology and Soils

The project study area extends through eight mapped soil series. The soil series descriptions were obtained by NRCS for Haywood County (USDA 1997).

**Table 3b. Project Study Area Soils and Characteristics**

Specific Map Unit	Percent Slope	Drainage Class	Hydric Class
Dillsboro Loam	8 to 15	Well Drained	Non-hydric
Dillsboro-Urban land complex	2 to 15	Well Drained	Non-hydric
Edneyville-Chestnut complex	15 to 30	Well Drained	Non-hydric
Evard-Cowee complex	15 to 30	Well Drained	Non-hydric
Hayesville clay loam	8 to 15	Well Drained	Non-hydric
Saunook loam	2 to 8	Well Drained	Non-hydric
Saunook loam	8 to 15	Well Drained	Non-hydric
Udorthents, loamy			

c. Biotic Resources

There are three terrestrial communities located within the project study area. Community boundaries within the study area are generally well defined without a significant transition zone between them. The observed communities in order of their predominance within the study area are: (1) Disturbed Mesic Mixed Hardwood Forest (Piedmont Subtype) (2) Mesic Mixed Hardwood Forest (Piedmont Subtype), and (3) maintained/disturbed.

Terrestrial impacts can result in changes in both species numbers and composition. Plant communities found along the proposed project study area often serve as nesting and sheltering habitat for wildlife. The proposed project construction may reduce the existing habitat for these species, thereby diminishing fauna numbers. Additionally, the reduction of habitat within the project study area concentrates wildlife into smaller areas of refuge, therefore causing some species to become more susceptible to disease, predators, and starvation. Ecological impacts can also occur outside of the project study area because of habitat reduction. Typically, those areas modified by construction (but not paved) will become road shoulders and early successional habitat. The reduction/change of habitat, while attracting other wildlife, may displace

existing wildlife further from the roadway. The animals displaced by construction activities may repopulate other areas suitable for the species. However, the increased animal density can result in an increase in competition for the remaining resources.

The widening of NC 209 may result in certain unavoidable impacts to the aquatic communities. Probable impacts resulting from changes in water quantity and quality will include the physical disturbance of the benthic and water column habitats. Significant disturbance of stream segments can also have an adverse effect on aquatic community composition by reducing species diversity and the overall quality of aquatic habitats. Physical alterations to aquatic habitats can result in the following impacts to aquatic communities:

- Inhibition of plant growth.
- Resuspension of organic detritus and removal of aquatic vegetation that can lead to increased nutrient loading. Nutrient loading can lead to algal blooms and ensuing depletion of dissolved oxygen levels.
- Increases in suspended and settleable solids that can lead to clogging of feeding structures of filter-feeding organisms and the gills of fish.
- Loss of benthic macroinvertebrates through increased scouring and sediment loading.
- Loss of fish shelter through removal of overhanging stream banks and snags.
- Increases in seasonal water temperatures resulting from removal of riparian canopy.

Unavoidable impacts to aquatic communities within and immediately downstream of the project study area will be minimized to the fullest degree practicable through strict adherence to NCDOT's *Best Management Practices for the Protection of Surface Waters* (NCDOT 1997).

## 2. Jurisdictional Topics

### a. Water Resources

The USACE promulgated the definition of "waters of the United States" under 33 CFR §328.3(a). "Waters of the United States" include most interstate and intrastate surface waters, tributaries, and wetlands. A wetland is an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR §328.3(b)). Wetlands generally include swamps, marshes, bogs, and other similar areas. Any action that proposes to place dredged or fill materials into "waters of the United States" falls under the jurisdiction of the USACE, and

must follow the statutory provisions under Section 404 of the CWA (33 U.S.C. 1344).

Water resources within the project study area include five unnamed tributaries (UTs) to Richland Creek, and six wetlands. The streams are located within the French Broad Drainage Basin and are designated as Subbasin 04-03-05 according to the NCDWQ system for cataloging drainage basins, and USGS Hydrologic Unit (HU) 06010106 according to the federal system for cataloging drainage basins. Richland Creek from the Lake Junaluska dam to the Pigeon River is included on the 303(d) list for impaired biological integrity. The potential sources include agriculture and urban runoff/storm sewers.

**Table 3c. Stream Classification and Impacts**

STREAM	DWQ PRIMARY WATER RESOURCE CLASSIFICATION	CLASSIFICATION	STREAM IMPACTS (ft)
UT 1 (Richland Creek)	C	Perennial	0 ft
UT 2 (Richland Creek)	C	Perennial	0 ft
UT 3 (Richland Creek)	C	Perennial	120 ft
UT 4 (Richland Creek)	C	Perennial	0
UT 5 (Richland Creek)	C	Perennial	300 ft
TOTAL IMPACTS			420 ft

**Table 3d: Wetland Impacts**

WETLAND NAME	AREA IMPACTS (ac)
Wetland 1	0 acres
Wetland 2	0 acres
Wetland 3	0 acres
Wetland 4	0 acres
Wetland 5	0 acres
Wetland 6	0 acres
TOTAL IMPACTS	0 acres

### 3. Mitigation

The USACE has adopted, through the CEQ, a wetland mitigation policy that embraces the concept of "no net loss of wetlands". The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of "waters of the United States", specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts; minimizing impacts; rectifying impacts; reducing impacts over time; and compensating for impacts (40 CFR §1508.20). These three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially. Currently, Specific mitigation measures for this project are not warranted.

### 4. Permits

The factors that may determine the applicability of a Nationwide Permit (NWP) as authorized by 33 CFR §33 include total stream and wetland impacts, impacts to cultural resources, impacts to federally protected species, or impacts to High Quality Waters (HQW). Although an individual site may qualify under NWP authorizations, overall, cumulative impacts from a single and complete project may require authorization under an Individual Permit (IP).

Due to the scope of this project, minimal impacts are expected to occur. An Individual Permit will likely be applicable for the proposed project because cumulative stream impacts exceed 300 feet. Impacts to less than 300 linear feet of the same stream maybe permitted by nationwide Permit (NWP) from the US Army Corps of Engineers under the authority of Section 404 of the Clean Water Act. Impacts greater than 300 linear feet of the same stream or cumulative impacts require an Individual Permit (IP). Wetland impacts of greater than 0.5 acres would require an IP as well. Wetland impacts are not a factor in determining permit applicability in this project.

Other permits that may apply include a NWP No. 33 for temporary construction activities such as stream dewatering, work bridges, or temporary causeways that are often used during bridge construction or rehabilitation. The USACE holds the final discretion as to what permit will be required to authorize project construction.

In addition to the 404 permit, other required authorizations include the corresponding Section 401 Water Quality Certification (WQC) from the NCDWQ. Section 401 of the CWA requires that the state can issue or deny a WQC for any federally permitted or licensed activity that may result in a discharge to "waters of the United States". A NCDWQ Section 401 Water Quality General certification for minor road crossing (GC 3404) may be required prior to the issuance of a Section 404 Permit. Other required

401 certifications may include a GC 3366 for temporary construction access and dewatering.

The project occurs in Haywood County, which is a NCWRC designated “trout” county. Since the proposed project is located in a designated “trout” county, the authorization of nationwide permit by the USACE is conditioned upon the concurrence of the NCWRC.

Haywood County is currently participating in the National Flood Insurance Regular Program. UT3 to Richland Creek is not in a designated flood hazard zone on the currently effective Flood Insurance Rate Map (8/17/1998) published by the Federal Emergency Management Agency (FEMA). Hydraulics Unit will coordinate with FEMA and local authorities in the final design stage of the project to ensure compliance with applicable floodplain management ordinances.

The proposed project is located in the Tennessee Valley Authority’s (TVA) Land Management District. A permit pursuant to Section 26a of the TVA Act is also required for all construction or development involving streams or floodplains in the Tennessee River Drainage Basin.

#### 5. Federally Protected Species

Species federally classified as Endangered (E), Threatened (T), Proposed Endangered (PE), Proposed Threatened (PT), and Threatened due to similarity of appearance (T (S/A)) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended (16U.S.C. 1531 *et seq.*). Endangered refers to “any species which is in danger of extinction throughout all or a significant portion of its range”, and threatened refers to “any species likely to become an Endangered Species within the foreseeable future throughout all of a significant portion of its range (16 U.S.C. 1532).” The USFWS lists the following federally protected species for Haywood County.

**Table 3e. Federally Protected Species in Haywood County**

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	BIOLOGICAL CONCLUSION
<i>Alasmidonta raveneliana</i>	Appalachian elktoe	Endangered	No Effect
<i>Glyptemys muhlenbergii</i>	Bog Turtle	T (S/A)	No Survey Required
<i>Glaucomys sabrinus coloratus</i>	Carolina northern flying squirrel	Endangered	No Effect
<i>Gymnoderma lineare</i>	Rock gnome lichen	Endangered	No Effect
<i>Haliaeetus leucocephalus</i>	Bald eagle	Recoverd	No Eagle Found
<i>Isotria medeoloides</i>	Small-whotled pogonia	Threatened	No Effect
<i>Myotis Sodalis</i>	Indiana bat	Endangered	No Effect
<i>Myotis grisescens</i>	Gray bat	Endangered	No Effect
<i>Puma concolor</i> cougar	Eastern cougar	Endangered	No Effect
<i>Microhexura montivaga</i>	Spruce-fir moss spider	Endangered	No Effect

**Appalachian elktoe  
Endangered**

**Biological Conclusion: No Effect**

Transportation Improvement Project R-4047 will impact a small unnamed tributary to Richland Creek, Pigeon River Watershed of the French Broad Basin. The federally endangered Appalachian elktoe (*Alasmidonta raveneliana*) is listed by the US Fish and Wildlife Service for Haywood County. A known population of this species occurs in the Pigeon River near the project site. The habitat that will be affected by the project is not suitable for this species. Additionally, habitat degradation caused by the development of the towns of Waynesville, Canton and Clyde as well as a long history of pollution from a paper mill on the Pigeon River in the town of Canton have eliminated this species from the watershed in the area that the project will affect directly or indirectly. The biological conclusion for this species is No Effect.

Critical habitat for the Appalachian elktoe is designated within Haywood County. The entire critical habitat is located in the Pigeon River mainstem, East Fork Pigeon mainstem and West Fork Pigeon River mainstem upstream of NC 215 crossing of the Pigeon River in the town of



Canton. The mouth of Richland Creek at the Pigeon River is approximately 9 miles downstream of the downstream limits of the designated critical habitat. There is no chance for project R-4047 to affect the critical habitat

**Bog turtle** **Biological Conclusion: No survey required**  
**Threatened Due to Similarity of Appearance (southern population)**

Habitat for the bog turtle consist of fens, sphagnum bogs, swamps marshy meadows and pastures. Areas with clear, slow-flowing water, soft mud substrate, and an open canopy are ideal. As of October 25, 2004, site investigations revealed that habitat for the bog turtle in the form of fens, sphagnum bogs, swamps, marshy meadows, and marshy pastures were not present within the project study area. Additionally, an October 4, 2004 review of the NCNHP database of rare species and unique habitats revealed no known population of bog turtle within 1.0 mile of the project study corridor. This species is listed as Threatened Due to Similarity of Appearance, and is therefore not protected under Section 7 of the Endangered Species Act. Consequently, no survey is required for this species. The biological conclusion for the bog turtle remains “No Survey Required”.

**Carolina northern flying squirrel** **Biological Conclusion: No Effect**  
**Endangered**

Habitat for the Carolina northern flying squirrel consists of areas found at the ecotone between coniferous and northern hardwood forests, at elevations greater than 5,000 ft. As of October 25, 2004, site investigations revealed that habitat for the Carolina northern flying squirrel in the form of an ecotone between coniferous and northern hardwood forests at elevations greater than 5,000 ft were not present within the project study area. The highest elevation within the project study area is 2,650 ft above msl. Additionally, an October 4, 2004 review of the NCNHP database of rare species and unique habitats revealed no known populations within 1.0 mile of the project study area. Consequently, the proposed project will have “No Effect” on the Carolina northern flying squirrel.

**Rock gnome lichen** **Biological Conclusion: No Effect**  
**Endangered**

The rock gnome requires a habitat of high humidity and bare rock faces for its survival. Suitable habitat for the rock gnome can be found either at high elevations where it is frequently exposed to fog, or (less frequently) deep river gorges. As of October 25, 2004, site investigations revealed that habitat for the rock gnome lichen in the form of high elevations (>5,000 ft), or deep river gorges were not present within the project study

area. Additionally, an October 4, 2004 review of the NCNHP database of rare species and unique habitats revealed no known populations within 1.0 mile of the project study area. Consequently, the proposed project will have “No Effect” on the rock gnome lichen.

**Bald eagle  
Recovered (July 9, 2007)**

**Biological Conclusion: No eagle found**

The bald eagle requires nesting resources found in close proximity to water (within 0.5 mile), with a clear flight path to the water, and having an open view of the surrounding land. The bald eagle has been delisted from the Endangered Species Act as of August 8, 2007. It is still protected under the Bald and Golden Eagle Protection Act. A survey for Bald Eagles was conducted August 1, 2005 by Emilio Ancaya of HSMM, Inc. Bald Eagle habitat is present approximately a half mile to the west of the project at Lake Junaluska. Large trees near the lake were examined for eagle nests with no eagles or eagle nests being observed. The Natural Heritage Database was reviewed January 24, 2008 and no eagles were listed within one mile of the project area.

**Small-whorled pogonia  
Threatened**

**Biological Conclusion: No Effect**

Small-whorled pogonia grows in second growth deciduous or deciduous-coniferous forests, with an open canopy, open shrub layer, and sparse herb layer. It prefers acidic soils. A survey for Small-whorled pogonia was conducted August 1, 2005 by Emilio Ancaya of HSMM, Inc. Habitat is present in the project area; however no plants were observed during the survey. The Natural Heritage Database was reviewed January 24, 2008 and no populations of small-whorled pogonia were listed within one mile of the project area. The Biological Conclusion for Small-whorled pogonia is “No Effect”.

**Indiana bat  
Endangered**

**Biological Conclusion: No Effect**

The Indiana bat requires deep, vertical caves for summer roosting and winter hibernation. These caves are usually within 0.6 mile of a river or reservoir, which provides foraging habitat. Site investigations revealed that habitat for the Indiana bat in the form of deep vertical caves with large rooms were not present within the project study area. Additionally, the review of the NCNHP database of rare species and unique habitats revealed no known populations within 1.0 mile of the project study area. Consequently, the proposed project will have “No Effect” on the Indiana bat.

**Gray bat  
Endangered**

**Biological Conclusion: No Effect**

The gray bat requires deep, vertical caves for summer roosting and winter hibernation. These caves are usually within 0.6 mile of a river or reservoir, which provides foraging habitat. As of October 25, 2004, site investigations revealed that habitat for the gray bat in the form of deep vertical caves with large rooms were not present within the project study area. Additionally, an October 4, 2004 review of the NCNHP database of rare species and unique habitats revealed no known populations within 1.0 mile of the project study area. Consequently, the proposed project will have "No Effect" on the gray bat.

**Eastern cougar  
Endangered**

**Biological Conclusion: No Effect**

Habitat requirements for the Eastern Cougar consist primarily of large tracts of wilderness and adequate prey. As of October 25, 2004, site investigations revealed that habitat for the Eastern Cougar in the form of a large wilderness area with an adequate food supply was not present within the project study area. Additionally, an October 4, 2004 review of the NCNHP database of rare species and unique habitats revealed no known populations within 1.0 mile of the project study area. Consequently, the proposed project will have "No Effect" on the Eastern Cougar.

**Spruce-fir moss spider  
Endangered**

**Biological Conclusion: No Effect**

The spruce-fir moss spider is typically found in damp moss and liverwort mats growing on rocks in well shaded, mature, high elevation Fraser fir and red spruce forests. As of October 25, 2004, site investigations revealed that habitat for the spruce-fir moss spider in the form of damp moss and liverwort mats growing on rocks in well shaded, mature, high elevation Fraser fir and red spruce forests were not present within the project study area. Additionally, an October 4, 2004 review of the NCNHP database of rare species and unique habitats revealed no known populations within 1.0 mile of the project study area. Consequently, the proposed project will have "No Effect" on the spruce-fir moss spider.

**D. TRAFFIC NOISE**

**1. General**

This analysis was performed to determine the effect on traffic noise levels in the immediate project area as the result of widening of NC 209 to

four lane divided with median, from south of US 19-23-74 to north of SR 1523 (Appendix C).

## 2. Noise Abatement Criteria

The Federal Highway Administration (FHWA) has developed Noise Abatement Criteria (NAC) and procedures to be used in the planning and design of highways to determine whether highway noise levels are or are not compatible with various land uses. These abatement criteria and procedures are set forth in the aforementioned Federal reference (Title 23 CFR Part 772). A summary of the noise abatement criteria for various land uses is presented in Appendix C, Table N2. The Leq, or equivalent sound level, is the level of constant sound which in a given situation and time period has the same energy as does time varying sound. In other words, the fluctuating sound levels of traffic noise are represented in terms of a steady noise level with the same energy content.

## 3. Traffic Noise Abatement Measures

If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered. Consideration for noise abatement measures must be given to all impacted receptors. There are impacted receptors due to highway traffic noise in the project area. The following discussion addresses the applicability of these measures to the proposed project.

### a. Highway Alignment Selection

Highway alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts and costs. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment selection is primarily a matter of siting the roadway at a sufficient distance from noise sensitive areas. Changing the highway alignment is not a viable alternative for noise abatement.

### b. Traffic System Management Measures

Traffic system management measures, which limit vehicle type, speed, volume and time of operations, are often effective noise abatement measures. For this project, traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service of the proposed facility.

Past project experience has shown that a reduction in the speed limit of 10 mph would result in a noise level reduction of approximately 1 to 2 dBA. Because most people cannot detect a noise reduction of up to 3 dBA and reducing the speed limit would reduce roadway capacity, it is not considered a viable noise abatement measure. This and other traffic system management measures, including the prohibition of truck operations, are not considered to be consistent with the project's objective of providing a high-speed, limited-access facility.

c. Noise Barriers

Physical measures to abate anticipated traffic noise levels are often applied with a measurable degree of success on fully controlled facilities by the application of solid mass, attenuable measures strategically placed between the traffic sound source and the receptors to effectively diffract, absorb, and reflect highway traffic noise emissions. Solid mass, attenuable measures may include earth berms or artificial abatement walls.

For a noise barrier to provide sufficient noise reduction it must be high enough and long enough to shield the receptor from significant sections of the highway. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It then becomes economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be 8 times the distance from the barrier to the receptor. For example, a receptor located 50' from the barrier would normally require a barrier 400' long. An access opening of 40 feet (10 percent of the area) would limit its noise reduction to approximately 4 dBA (FUNDAMENTAL AND ABATEMENT OF HIGHWAY TRAFFIC NOISE, Report No. FHWA-HHI-HEV-73-7976-1, USDOT, chapter 5, section 3.2, page 5-27). Hence, this type of control of access effectively eliminates the consideration of berms or noise walls as noise mitigation measures.

In addition, businesses, churches, and other related establishments located along a particular highway normally require accessibility and high visibility. Solid mass, attenuable measures for traffic noise abatement would tend to disallow these two qualities, and thus, would not be acceptable abatement measures in this case.

#### d. Other Mitigation Measures Considered

The use of vegetation for noise mitigation is not considered reasonable for this project, due to the amount of substantial amount of right-of-way necessary to make vegetative barriers effective. FHWA research has shown that a vegetative barrier should be approximately 100' wide to provide a 3-dBA reduction in noise levels. In order to provide a 5-dBA reduction, substantial amounts of additional right-of-way would be required. The cost of the additional right-of-way and plant sufficient vegetation is estimated to exceed the abatement threshold of \$35,000 per benefited receptor. Noise insulation was also considered; however, no public or non-profit institutions were identified that would be impacted by this project.

#### 4. "Do-Nothing" Alternative

The traffic noise impacts for the "do nothing" or "no-build" alternative was also considered. If the proposed widening did not occur, 12 receptors would experience traffic noise impacts by approaching or exceeding the FHWA NAC. Also, the receptors could anticipate experiencing an increase in exterior noise levels in the range of +1 to +7 dBA. It is barely possible to detect noise level changes of 2-3 dBA. A 5-dBA change in noise levels is more readily noticed.

#### 5. Construction Noise

The major construction elements of this project are expected to be earth removal, hauling, grading, and paving. General construction noise impacts, such as temporary speech interference for passers-by and those individuals living or working near the project, can be expected particularly from paving operations and from the earth moving equipment during grading operations. However, considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours, these impacts are not expected to be substantial. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

#### 6. Summary

Traffic noise impacts are an unavoidable consequence of transportation projects especially in areas where there are not traffic noise sources. All traffic noise impacts were considered for noise mitigation. Based on these preliminary studies, traffic noise abatement is not recommended, and no noise abatement measures are proposed. This

evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772, and unless a major project change develops, no additional noise reports will be submitted for this project.

#### E. Air Quality Analysis

Haywood County has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR part 51 and 93 is not applicable, because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

The background CO concentration for the project area was estimated to be 1.8 parts per million (ppm). Consultation with the Air Quality Section, Division of Environmental Management (DEM), North Carolina Department of Environment and Natural Resources indicated that an ambient CO concentration of 1.8 PPM is suitable for most suburban and rural areas.

The worst-case air quality scenario was determined to be in the vicinity of the intersection of NC 209 and SR 1801. The predicted 1-hour average CO concentrations for the evaluation build years of 2005, 2010, and 2025 are 3.50, 3.50, and 3.70 ppm, respectively. Comparison of the predicted CO concentrations with the NAAQS (maximum permitted for 1-hour averaging period = 35 ppm; 8-hour averaging period = 9 ppm) indicates no violation of these standards. Since the results of the worst-case 1-hour CO analysis for the build scenario is less than 9 ppm, it can be concluded that the 8-hour CO level does not exceed the standard Appendix C Table A-1 to A-3).

##### 1. Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

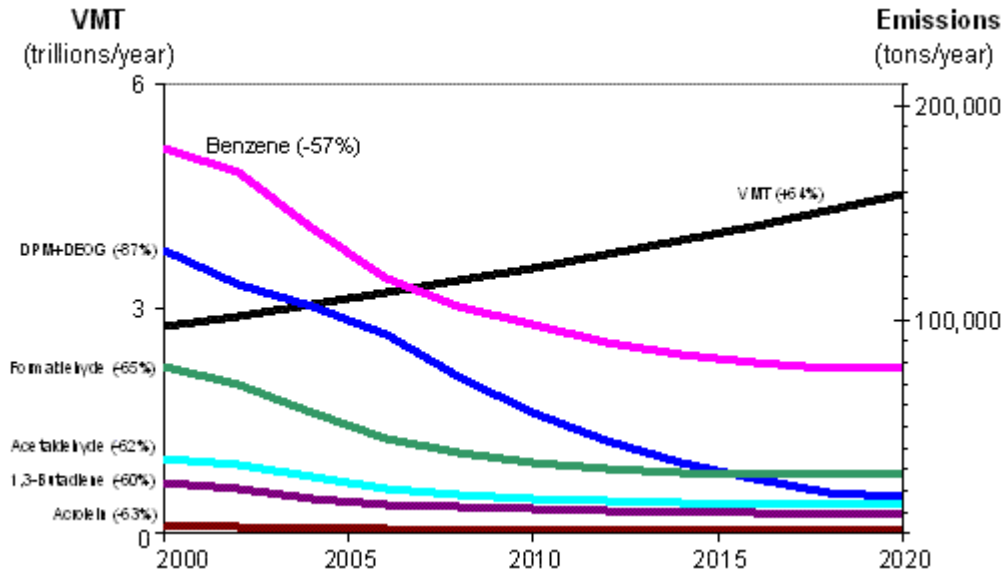
Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs.

The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001).

This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements.

Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: Highway Statistics 2000, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO<sub>4</sub> from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l)



that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

2. Unavailable Information for Project Specific MSAT Impact Analysis

This EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EA]. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

3. Information that is Unavailable or Incomplete.

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

a. Emissions

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

b. Dispersion

The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

c. Exposure Levels and Health Effects.

Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupported assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely

to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

4. Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs.

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at <http://www.epa.gov/iris>. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

Benzene is characterized as a known human carcinogen. The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals. 1,3-butadiene is characterized as carcinogenic to humans by inhalation.

Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems<sup>1</sup>. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

**Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community.**

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment." In this document, FHWA

has provided a quantitative analysis of MSAT emissions relative to the various alternatives, (or a qualitative assessment, as applicable) and has acknowledged that (some, all, or identify by alternative) the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

## 5. Minor Widening Project

For each alternative in this EIS/EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes.

The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at intersection of US 321/US421 (East King Street) and US 221/NC 105, under alternatives 1 and 2. However, as discussed above, the magnitude

and the duration of these potential increases compared to the No-build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

## 6. MSAT Mitigation Strategies

Lessening the effects of mobile source air toxics should be considered for projects with substantial construction-related MSAT emissions that are likely to occur over an extended building period, and for post-construction scenarios where the NEPA analysis indicates potentially meaningful MSAT levels. Such mitigation efforts should be evaluated based on the circumstances associated with individual projects, and they may not be appropriate in all cases. However, there are a number of available mitigation strategies and solutions for countering the effects of MSAT emissions.

## 7. Mitigating for Construction MSAT Emissions

Construction activity may generate a temporary increase in MSAT emissions. Project-level assessments that render a decision to pursue construction emission mitigation will benefit from a number of technologies and operational practices that should help lower short-term MSATs. In addition, the SAFETEA-LU has emphasized a host of diesel retrofit technologies in the law's CMAQ provisions - technologies that are designed to lessen a number of MSATs.<sup>1</sup>

Construction mitigation includes strategies that reduce engine activity or reduce emissions per unit of operating time. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits when sites are near vulnerable populations. For example, agreements that stress work activity outside normal hours of an adjacent school campus would be operations-oriented mitigation. Also on the construction emissions front, technological adjustments to equipment, such as off-road dump trucks and bulldozers, could be appropriate strategies. These technological fixes could include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. The use of clean fuels, such as ultra-low sulfur diesel, also can be a very cost-beneficial strategy.

The EPA has listed a number of approved diesel retrofit technologies; many of these can be deployed as emissions mitigation measures for equipment used in construction. This listing can be found at: [www.epa.gov/otaq/retrofit/retroverifiedlist.htm](http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm)

#### 8. Post-Construction Mitigation for Projects with Potentially Significant MSAT Levels

Longer-term MSAT emissions can be more difficult to control, as variables such as daily traffic and vehicle mix are elusive. Operational strategies that focus on speed limit enforcement or traffic management policies may help reduce MSAT emissions even beyond the benefits of fleet turnover. Well-traveled highways with high proportions of heavy-duty diesel truck activity may benefit from active Intelligent Transportation System programs, such as traffic management centers or incident management systems. Similarly, anti-idling strategies, such as truck-stop electrification can complement projects that focus on new or increased freight activity.

Planners also may want to consider the benefits of establishing buffer zones between new or expanded highway alignments and areas of vulnerable populations. Modifications of local zoning or the development of guidelines that are more protective also may be useful in separating emissions and receptors.

The initial decision to pursue MSAT emissions mitigation should be the result of interagency consultation at the earliest juncture. Options available to project sponsors should be identified through careful information gathering and the required level of deliberation to assure an effective course of action.

#### F. Hazardous Materials Evaluation

##### 1. Purpose

The purpose of this evaluation is to identify properties within the project study area that are or may be contaminated and therefore result in increased project costs and future liability if acquired by the NCDOT. Geo-environmental impacts may include, but are not limited to, active and abandoned underground storage tanks (UST) sites, hazardous waste sites, regulated landfills and unregulated dumpsites. Table 6 shows the potential hazardous sites on the project and any impacts brought on by its construction.

## 2. Summary

Five sites currently or formerly containing petroleum underground storage tanks (USTs) exist within the project study area. This total number includes one active gas station and four former underground petroleum storage sites. All USTs have been removed from the four former UST sites.

The Geo-environmental Section observed no additional contaminated properties during the field reconnaissance and regulatory agencies' record search. If any USTs or any potential source of contamination is discovered by Right of Way personnel during the initial contacts with impacted property owners, NCDOT be notified of their presence prior to acquisition, so an assessment can be conducted to determine the extent of any contamination. This assessment will also serve to estimate the associated clean up costs and allow for right of way recommendations.

**Table 3f. Underground Storage Tank Facilities**

Underground Storage Tank (UST) Facilities				
Site #	Business Name and Location	Anticipated Impacts	Anticipated Severity	Comments
1	Convenience King #7 65 Paragon Pkwy Waynesville, NC	Petroleum contaminated soils	Negligible to Low	Active gas station has four (4) USTs
2	David's Home Entertainment 100 Access Road Waynesville, NC	Petroleum contaminated soils	Negligible to Low	Former gas station. USTs removed in 1986
3	Biller Automotive Repair 20 Old Clyde Road Waynesville, NC	Petroleum contaminated soils	Negligible to Low	Four USTs removed in 1991
4	Clear View Glass 11 Old Clyde Road Waynesville, NC	Petroleum contaminated soils	Negligible to Low	Five USTs removed in 1992
5	9 Haywood Office Park Waynesville, NC	Petroleum contaminated soils	Negligible	Seven USTs removed from site in 1992

## G. Construction Impacts

To minimize potential adverse effects caused by construction of the proposed project, the following measures, along with those previously stated, will be enforced during the construction phase:



1. All possible measures will be taken to insure that the public's health and safety will not be compromised during the movement of any materials to and from construction sites along the project, and that any inconveniences imposed on the public will be kept to a minimum.
2. Dust control will be exercised at all times to prevent endangering the safety and general welfare of the public and to prevent diminishing the value, utility, or appearance of any public or private properties.
3. The contractor shall be required to observe and comply with all laws, ordinances, regulations, orders and decrees, including those of the N.C. State Board of Health, regarding the disposal of solid waste. All solid waste will be disposed of in accordance with the Standard Specifications of the Division of Highways. These specifications have been reviewed and approved by the Solid Waste Vector Control Section of the Division of Health Services, N. C. Department of Human Resources.
4. Waste and debris will be disposed of in areas outside of the right of way and provisions or unless disposal within the right of way is permitted by the Engineer. Disposal of waste and debris in active public waste or disposal areas will not be permitted without prior approval by the Engineer. Such approval will not be permitted when, in the opinion of the Engineer, it will result in excessive siltation or pollution.
5. The construction of the project is not expected to cause any serious disruptions in service to any of the utilities serving the area. Before construction is started, a pre-construction conference involving the contractor, pertinent local officials and the Division of Highways will be held to discuss various construction procedures, including a discussion of precautionary steps to be taken during the time of construction that will minimize interruption of service.

Prior to construction, a determination will be made regarding the need to relocate or adjust any existing utilities in the project area. A determination of whether the NCDOT or the utility owner will be responsible for this work will be made at that time.

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition, or other operations will be removed from the project, burned, or otherwise disposed of by the contractor. Any burning will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina State Implementation Plan for Air Quality. Care will be taken to insure burning

will be done at the greatest distance practicable from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance.

The contractor will devise an erosion control schedule before work is started. The schedule will show the time relationship between phases of the work that must be coordinated to reduce erosion and shall describe construction practices and temporary erosion control measures that will be used to minimize erosion. In conjunction with the erosion control schedule, the contractor will be required to follow those provisions of the plans and specifications that pertain to erosion and siltation. These contract provisions are in accordance with the strict federal erosion control measures. Temporary erosion control measures such as the use of berms, dikes, dams, silt basins, etc. will be used as needed.

Prior to the approval of any borrow source developed for use on this project, the contractor shall obtain a certification from the state Department of Cultural Resources certifying that the removal of material from the borrow source will have no effect on any known district, site, building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places. A copy of this certification shall be furnished to the Engineer prior to performing any work on the proposed borrow source.

Traffic service in the immediate project area may be subjected to brief disruption during construction of the project. Every effort will be made to insure that the transportation needs of the public will be met both during and after construction.

## VI. COMMENTS AND COORDINATION

### A. COORDINATION

During the preliminary engineering phase of this project, NCDOT maintained contact with several local, state and federal agencies. Correspondence requesting environmental input was sent to the following agencies, and replies were received from those marked with an asterisk (\*).

US Army Corps of Engineers (Asheville, NC Regulatory Field Office)\*  
US Environmental Protection Agency (Raleigh)\*  
US Fish and Wildlife Service (Asheville)\*  
Tennessee Valley Authority\*  
NC Dept. of Administration (State Clearinghouse)\*  
NC Dept. of Cultural Resources (Historic Preservation)\*  
NC Dept. of Public Instruction (School Planning)\*  
NC Dept. of Environment & Natural Resources\*  
NC Wildlife Resources Commission\*  
Haywood County Schools  
Community of Lake Junaluska

### B. PUBLIC INVOLVEMENT AND COMMENTS

NCDOT held a Citizen's Informational Workshop (CIW) for the project on November 18, 2003. Twelve citizens were in attendance. Handouts provided at the workshop included a comment sheet, so written comments could be received. The primary concern of citizens was the potential relocations due to the reconfiguration of the US 19-23-74/NC 209 interchange. In particular, concern was the possible relocations along SR 1375 (Access Road) when the new on ramp was constructed. Other concerns included bicycle and pedestrian safety along the existing and improved NC 209.

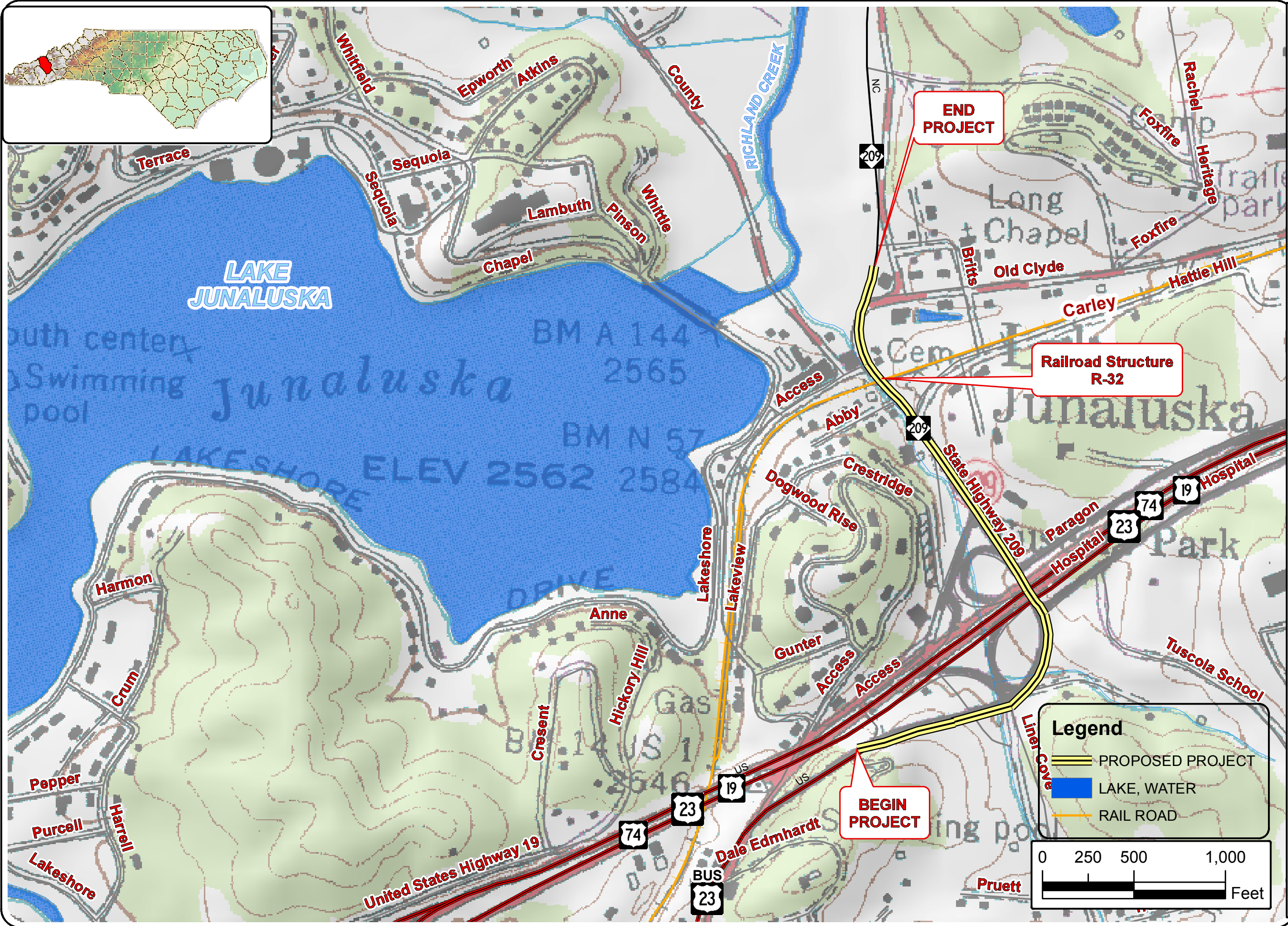
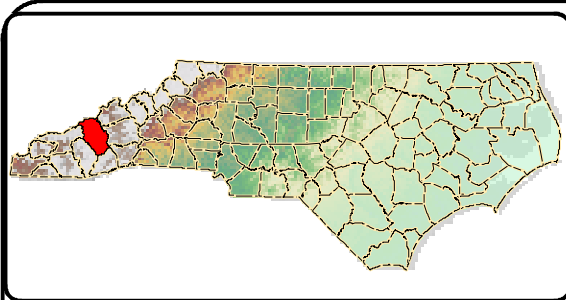
A public hearing will take place after the publication and distribution of this Environmental Assessment. At this hearing citizens are given the chance to learn about all of the project's design features and state publicly their individual choice for implementation and/or recommendations for modifications. After the hearing, a Finding of No Significant Impact document will be distributed and will include the recommended alternative for this project. The recommended alternative will be selected based on engineering, environmental information, and public comments.

## **VII. BASIS FOR ENVIRONMENTAL ASSESSMENT**

On the basis of planning and environmental studies, it is anticipated that this project will not have a significant detrimental effect on the quality of the human environment. The proposed project will cause no significant changes in route classification and land use and is not controversial in nature. The project has been reviewed by federal, state and local agencies and no objections have been raised. No major objections to the project were voiced at the citizen's informational workshop held on November 18, 2003. For these reasons, it is concluded that an Environmental Assessment is applicable to this project.

# **APPENDIX A**

## **(FIGURES)**



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

VICINITY MAP  
PROPOSED WIDENING OF NC 209  
& REPLACEMENT OF RAILROAD  
STRUCTURE R-32  
HAYWOOD COUNTY  
TIP PROJECT R-4047



County:  
HAYWOOD

Div: 14 TIP#: R-4047

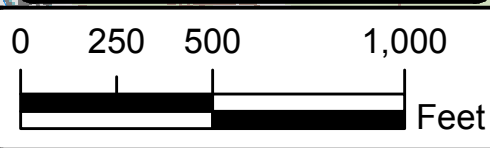
WBS: 34599.1.1

Date: NOV 2007

Figure  
**1**

**Legend**

- PROPOSED PROJECT
- LAKE, WATER
- RAIL ROAD







NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

EXISTING CONDITIONS  
PROPOSED WIDENING OF NC 209  
& REPLACEMENT OF RAILROAD  
STRUCTURE R-32  
HAYWOOD COUNTY  
TIP PROJECT R-4047



County:  
HAYWOOD

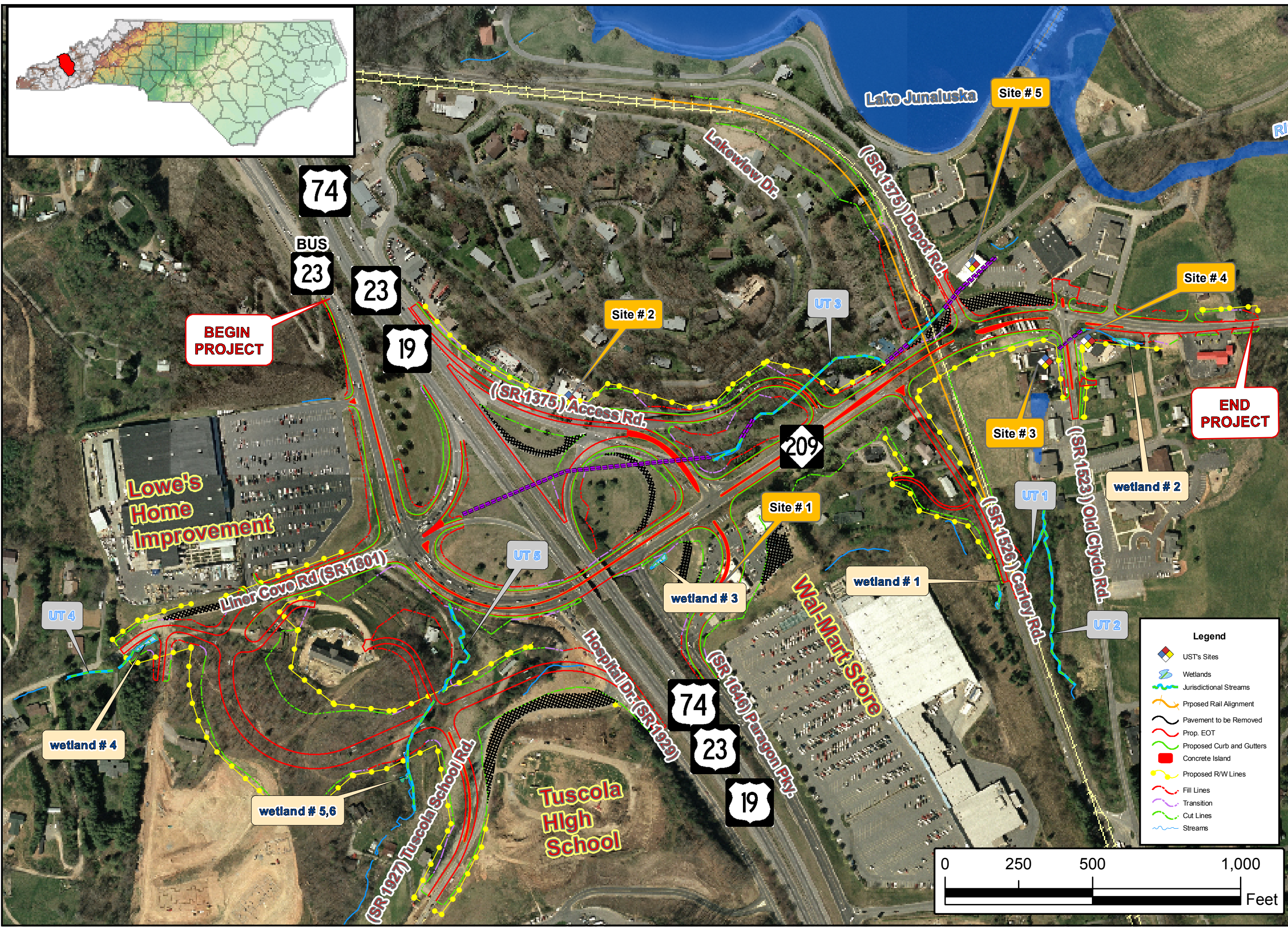
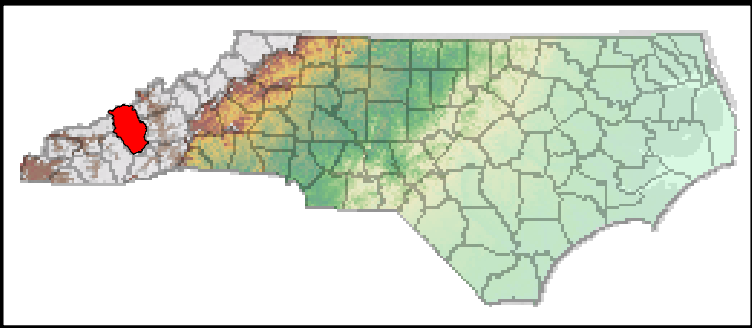
Div: 14      TIP# R-4047

WBS:  
34599.1.1

Date:  
NOV 2007

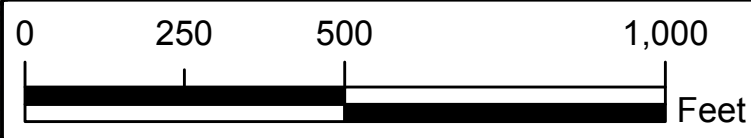
Figure  
**2**





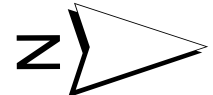
**Legend**

- UST's Sites
- Wetlands
- Jurisdictional Streams
- Proposed Rail Alignment
- Pavement to be Removed
- Prop. EOT
- Proposed Curb and Gutters
- Concrete Island
- Proposed R/W Lines
- Fill Lines
- Transition
- Cut Lines
- Streams



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

**PROPOSED IMPROVEMENTS  
PROPOSED WIDENING OF NC 209  
& REPLACEMENT OF RAILROAD  
STRUCTURE R-32**  
HAYWOOD COUNTY  
TIP PROJECT R-4047



County:  
HAYWOOD

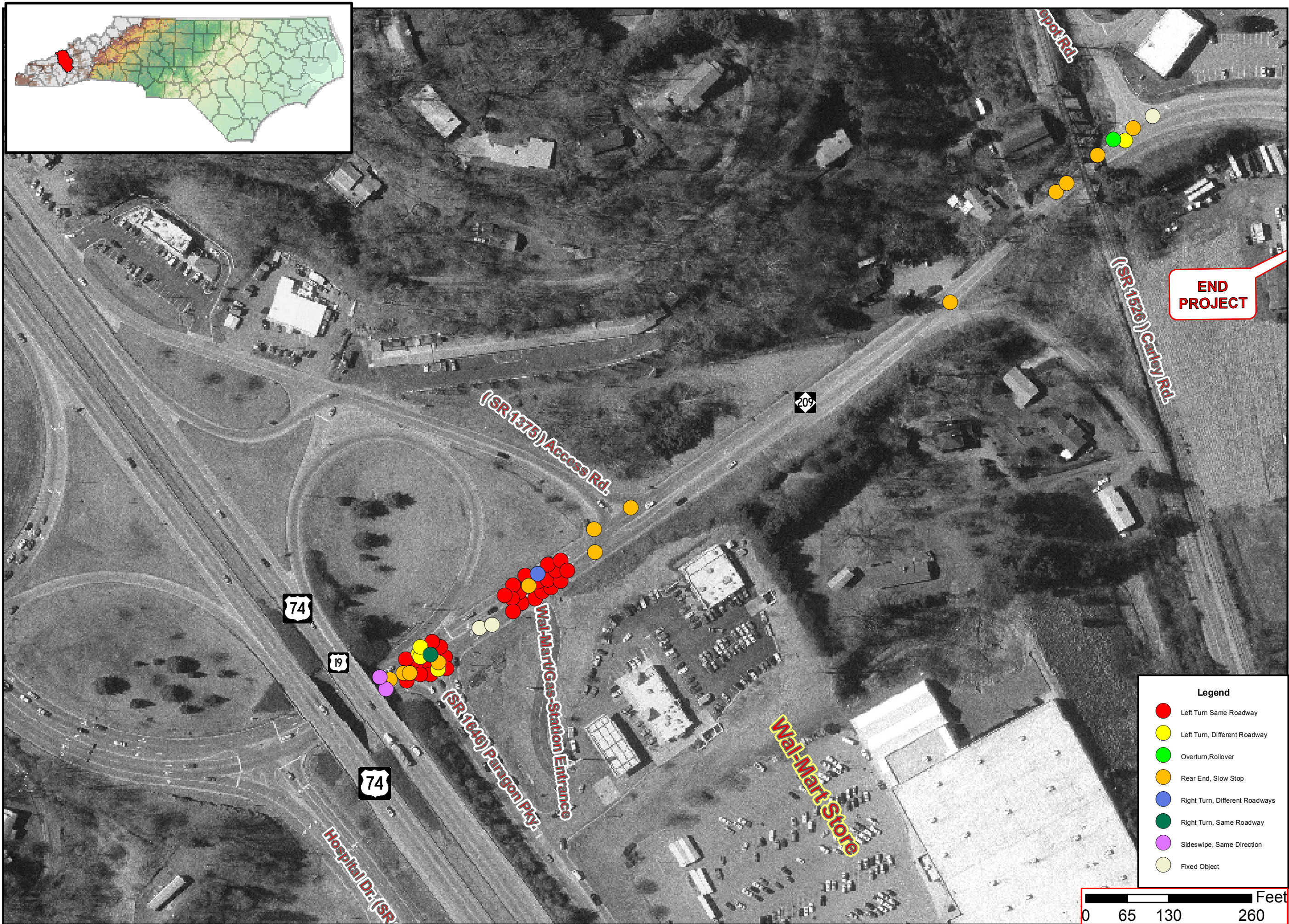
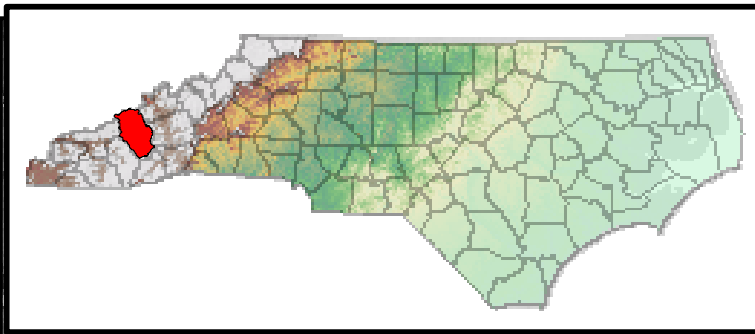
Div: 14      TIP# R-4047

WBS:  
34599.1.1

Date:  
NOV 2007

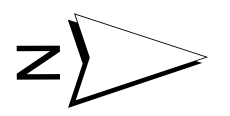
**Figure  
3**





NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

CRASH LOCATION FOR  
PROPOSED WIDENING OF NC 209  
& REPLACEMENT OF RAILROAD  
STRUCTURE R-32  
HAYWOOD COUNTY  
TIP PROJECT R-4047



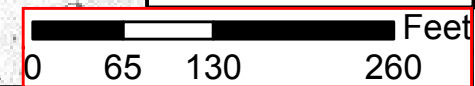
County:  
HAYWOOD

Div: 14      TIP# R-4047

WBS:  
34599.1.1

Date:  
NOV 2007

**Figure**  
**4**



**APPENDIX B**  
**(CORRESPONDENCE)**





North Carolina  
Department of Administration

Michael F. Easley, Governor

Office of the Secretary

January 9, 2001

Ms. Karen Capps  
N.C. Dept. of Transportation  
Project Dev. & Env. Analysis Branch  
Transportation Bldg. - 1548 MSC  
Raleigh NC 27699-1548

Dear Ms. Capps:

Subject: Scoping - Proposed Improvements to NC 209 from US 19-23 to just North of SR 1523;  
Haywood County; TIP #R-4047

The N. C. State Clearinghouse has received the above project for intergovernmental review. This project has been assigned State Application Number 01-E-4220-0397. Please use this number with all inquiries or correspondence with this office.

Review of this project should be completed on or before 03/14/2001. Should you have any questions, please call (919)807-2425.

Sincerely,

A handwritten signature in cursive script that reads "Chrys Baggett".

Ms. Chrys Baggett  
Environmental Policy Act Coordinator

**PLEASE NOTE NEW MAILING ADDRESS**  
**EFFECTIVE IMMEDIATELY**

**N.C. STATE CLEARINGHOUSE  
DEPARTMENT OF ADMINISTRATION  
1302 MAIL SERVICE CENTER  
RALEIGH, NC 27699-1302**

*Additional comment*



North Carolina  
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

June 1, 2000  
*June 9, 2000*

Mr. Karen Capps  
N.C. Dept. of Transportation  
Project Dev. & Env. Anal. Branch  
Transportation Building  
Raleigh, NC 27603

Dear Mr. Capps:

Re: SCH File # 00-E-4220-0514; Scoping Proposed Improvements to NC 209 from 0.2 Mile North of US 19-23-74 to Just North of SR 1523, Haywood County; TIP #R-4047

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter are comments made by agencies reviewing this document.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

Sincerely,  
*Chrys Baggett*

Ms. Chrys Baggett  
Environmental Policy Act Coordinator

Attachments

cc: Region A

---

**INTEROFFICE MEMORANDUM**

---

**To:** Karen Capps  
**From:** Sarah LeCount *SLC*  
**Subject:** R-4047: widen NC 209 from .2 mile north of US 19/23/74 to just north of SR 1523 at Lake Junaluska, Haywood County  
**Date:** 21 August 2000

Attached is a copy of the partially-signed concurrence form which states that the NCDOT and NCSHPO agree that:

- ◆ There are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's Area of Potential Effects.
- ◆ There are properties over fifty years old within the project's Area of Potential Effects, but based on the historical information available and the photographs of each property, the property identified as # 3 is considered not eligible for the National Register and no further evaluation of it is necessary.
- ◆ There are no National Register-listed properties within the project's Area of Potential Effects.

You have on file the signed concurrence form stating that Properties # 1 & 2 are also not eligible for the National Register. I will forward to you a copy of the form signed by the State Historic Preservation Officer when I receive it.

Please notify us **in writing** if the scope of this project changes. A change in scope may necessitate a new survey of the APE.

---

**HISTORIC ARCHITECTURE SECTION**

**PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS**

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TIP # R-4047

Federal Aid # 6.941013

County Haywood County

CONCURRENCE FORM  
FOR  
PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Brief Project Description

3-4 lane widening of NC 209 from just north of US 19-23-74 to just north of SR 1523

On 20 July 2000, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (SHPO)
- Other \_\_\_\_\_

reviewed the subject project at

- A scoping meeting
- Historic architectural resources photograph review session/consultation
- Other \_\_\_\_\_

All parties present agreed

there are no properties over fifty years old within the project's area of potential effect.

there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.

there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as 1-2 are considered not eligible for the National Register and no further evaluation of them is necessary.

there are no National Register-listed properties within the project's area of potential effect.

there are no historic properties affected by this project.

Signed:

Sarah W LeCount  
Representative, NCDOT

July 20, 2000  
Date

Michael C Dawson  
FHWA, for the Division Administrator, or other Federal Agency

8/3/00  
Date

April Montgomery  
Representative, SHPO

7/20/00  
Date

David Brook  
State Historic Preservation Officer

8/7/00  
Date

If a survey report is prepared, a final copy of this form and the attached list will be included.

---

INTEROFFICE MEMORANDUM

---

**To:** Karen Capps, PE, Project Planning Engineer  
**From:** Sarah LeCount, Architectural Historian *SLC*  
**Subject:** R-4047, Widening NC 209 from 0.2 miles north of US 19/23/74 to just north of SR 1523  
at Lake Junaluska, Haywood County  
**Date:** 8 September 2000

Attached are copies of the fully-signed concurrence forms which state that the NCDOT and the NC State Historic Preservation Office agree, for the above-mentioned project, that:

There are no properties less than fifty years old which are considered to Meet Criterion Consideration G within this project's Area of Potential Effects (APE).

There are properties over fifty years old within the project's APE, but based on the historical information available and the photographs of each property, properties identified as #1 – 3 are considered not eligible for the National Register and no further evaluation of them is necessary.

There are no National Register-listed properties within the project's APE.

Since there are no historic properties effected by the proposed project, compliance with Section 106 of the National Historic Preservation Act is complete.

Please notify us **in writing** if the scope of this project changes. A change in scope may necessitate a new survey of the APE.



TIP # R-4047

Federal Aid # STP-209(2)  
ER-00-9158

County Haywood County

CONCURRENCE FORM  
FOR  
PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Brief Project Description

Widen NC 209 from .2 mile north of US 19/73/74 to  
just north of SR 1523 at Lake Junaluska,  
Haywood County

On 17 August 2000, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (SHPO)
- Other \_\_\_\_\_

reviewed the subject project a:

- A scoping meeting
- Historic architectural resources photograph review session/consultation
- Other \_\_\_\_\_

All parties present agreed

- there are no properties over fifty years old within the project's area of potential effect.
- there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as #3 are considered not eligible for the National Register and no further evaluation of them is necessary.
- there are no National Register-listed properties within the project's area of potential effect.
- there are no historic properties affected by this project

Signed:

Sarah W. Le Court 17 August 2000  
Representative, NCDOT Date

Wendell C. Daur 8/29/00  
FHWA, for the Division Administrator, or other Federal Agency Date

Claudia Brown 8-17-00  
Representative, SHPO Date

David Knead 9/1/00  
State Historic Preservation Officer Date

Capps



North Carolina Department of Cultural Resources  
State Historic Preservation Office

David L. S. Brook, Administrator

James B. Hunt Jr., Governor  
Betty Ray McCain, Secretary

Division of Archives and History  
Jeffrey J. Crow, Director

April 8, 2000

MEMORANDUM

TO: William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
Division of Highways  
Department of Transportation

FROM: David Brook *David Brook*  
Deputy State Historic Preservation Officer

SUBJECT: NC 209 from 0.2 mile north of US 19-23-74 to just north of SR 1523,  
TIP R-4047, Haywood County, ER 00-9158

We regret that staff was unable to attend the March 15, 2000, scoping meeting for the above project.

We recommend that an architectural historian with NCDOT identify and evaluate properties over fifty years of age within the project area, paying special attention to the Lake Junaluska Assembly Grounds, and report the findings to us.

We recommend that a comprehensive survey be conducted by an experienced archaeologist to identify the presence and significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources should be assessed prior to the initiation of construction activities.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB:scb

cc: B. Church

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-8653
ARCHAEOLOGY	421 N. Blount St., Raleigh NC	4619 Mail Service Center, Raleigh NC 27699-4619	(919) 733-7342 • 715-2671
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St. Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801

Cape



# North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

James B. Hunt Jr., Governor  
Betty Ray McCain, Secretary

Division of Archives and History  
Jeffrey J. Crow, Director

May 30, 2000

## MEMORANDUM

TO: William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
Division of Highways  
Department of Transportation

FROM: David Brook *for David Brook*  
Deputy State Historic Preservation Officer



SUBJECT: NC 209 from North of US 19-23-74 to North of SR 1523, R-4047, Haywood County,  
ER 00-9158

Thank you for your letter of April 3, 2000, concerning the above project.

We apologize for the delay in our response.

We previously recommended that a comprehensive archaeological survey be conducted in association with this project. Our recommendation remains the same at this time.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB:scb

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SURVEY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801

MW/gg

cc: Linda Hall, Office of State Archaeology, Western Office  
Jeff Weller, PDEA  
John Sullivan, FHWA



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

March 2, 2005

Mr. Peter Sandbeck  
Deputy SHPO  
Historic Preservation Office  
Dept. of Cultural Resources  
4617 Mail Service Center  
Raleigh, North Carolina 27699-46517

Dear Mr. Brook:

Subject: Reconnaissance of NC 209 Widening, Haywood County, TIP R-4047, State Project No. 8.1944301, Federal Project No. STP-209(2), WBS# 34599.1.1, ER 00-9158, Division 13.

The State Historic Preservation Office has requested a full survey for the NC 209 Widening. The project consists of a short segment of two-lane roadway connecting already improved and widened five-lane curb and gutter facility. This section of less than 200 meters will be improved as a five-lane roadway with curb and gutter. The current Railway Bridge that passes over the road will be replaced in place. A brief pedestrian survey revealed that the widening of the roadway will only impact an area of already disturbed hillside. The hillside south of the railway has been already cut away, removing soil probably used as fill for the original roadway construction. North of the railway, the narrow roadway segment merges with a new five-lane roadway bordered by small commercial buildings. Replacement of the Railway Bridge that crosses above NC 209 will involve construction of a new bridge on the same location with wider support spans to accommodate the wider highway.

In consultation with the staff archaeologist for the Western Office of the Office of State Archaeology on February 24, a USGS map, a sketch map, and digital photographs demonstrated the disturbed nature of the proposed project. The on-site inspection concludes that the proposed project will impact no archaeological sites within the APE. A survey report would be unnecessary.

Any questions regarding the report findings should be directed to Gerold Glover, Ph.D. at (919) 715-1559.

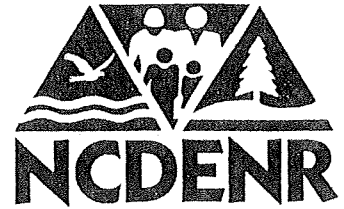
Sincerely,

A handwritten signature in black ink, appearing to read "Matt Wilkerson", with a long horizontal flourish extending to the right.

Matt Wilkerson,  
Archaeological Supervisor  
Office of Human Environment

North Carolina  
Department of Environment and Natural Resources

Michael F. Easley, Governor  
William G. Ross Jr., Secretary



**MEMORANDUM**

**TO:** Chrys Baggett  
State Clearinghouse

**FROM:** Melba McGee *W*  
Environmental Review Coordinator

**RE:** 01E-0397 Scoping NC 209 Improvements, Haywood  
County

**DATE:** March 1, 2001

The Department of Environment and Natural Resources has reviewed the proposed information. The attached comments are for the applicant's information and consideration.

Thank you for the opportunity to review.

**Attachments**

RECEIVED

MAR 5 2001

N.C. STATE CLEARINGHOUSE

1601 Mail Service Center, Raleigh, North Carolina 27699-1601  
Phone: 919 - 733-4984 \ FAX: 919 - 715-3060 \ Internet: [www.enr.state.nc.us/ENR/](http://www.enr.state.nc.us/ENR/)

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North Carolina  
Department of Administration

Michael F. Easley, Governor

Gwynn T. Swinson, Secretary

March 19, 2001

Ms. Karen Capps  
N.C. Dept. of Transportation  
Project Dev. & Env. Analysis Branch  
Transportation Bldg. - 1548 MSC  
Raleigh, NC 27699-1548

Dear Ms. Capps:

Re: SCH File # 01-E-4220-0397; Scoping Proposed Improvements to NC 209 from US 19-23 to just North of SR 1523; Haywood County; TIP #R-4047

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter are comments made by agencies reviewing this document.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

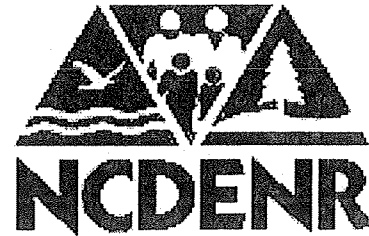
Sincerely,

Ms. Chrys Baggett  
Environmental Policy Act Coordinator

Attachments

cc: Region A

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality



Michael F. Easley, Governor  
Sherri Evans-Stanton, Acting Secretary  
Kerr T. Stevens, Director

January 12, 2001

**MEMORANDUM**

TO: William D. Gilmore, P.E., Manager  
NCDOT Project Development and Environmental Analysis Branch

THROUGH: John R. Dorney, NC Division of Water Quality

FROM: Cynthia F. Van Der Wiele *cvdw*

SUBJECT: Scoping comments on the proposed improvements to NC 209 from US 19/23/74 to SR 1523 in Haywood County, F.A. Project No. STP-209(2), State Project No. 8.1944301, TIP R-4047.

In reply to your correspondence dated December 19, 2000 (received January 11, 2001), in which you requested comments for the referenced project, preliminary analysis of the project reveals no potential for direct impacts to perennial streams or jurisdictional wetlands in the project area. Lake Junaluska and Richlands Creek are noted to be adjacent to the project site and have a water quality classification of B. The Division of Water Quality requests that NCDOT consider the following environmental issues for the proposed project:

- A. DWQ prefers replacement of bridges with bridges, particularly in higher quality waters (i.e. trout streams, water supply watersheds, high quality and outstanding resource waters). However, if the new structure is to be a culvert, it should be countersunk to allow unimpeded fish and other aquatic organisms passage through the crossing. Please be aware that floodplain culverts are required.
- B. The document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. There should be a discussion on mitigation plans for unavoidable impacts. If mitigation is required, it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. While the NCDWQ realizes that this may not always be practical, it should be noted that for projects requiring mitigation, appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.
- C. If there are impacts to water bodies, the DWQ requests that DOT strictly adhere to North Carolina regulations entitled, "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) throughout design and construction of the project, since the project is located in a trout county. In addition, please be aware that trout moratoriums set by the NC Wildlife Resource Commission will apply.



- D. When practical, the DWQ requests that bridges be replaced on the existing location with road closure. If a detour proves necessary, remediation measures in accordance with the NCDWQ requirements for General 401 Certification 2726/Nationwide Permit No. 33 (Temporary Construction, Access and Dewatering) must be followed.
- E. If applicable, DOT should not install the bridge bents in the creek, to the maximum extent practicable.
- F. Wetland and stream impacts should be avoided (including sediment and erosion control structures/measures) to the maximum extent practical. If this is not possible, alternatives that minimize wetland impacts should be chosen. Mitigation for unavoidable impacts will be required by DWQ for impacts to wetlands in excess of one acre and/or to streams in excess of 150 linear feet.
- G. Borrow/waste areas should not be located in wetlands. It is likely that compensatory mitigation will be required if wetlands are impacted by waste or borrow.
- H. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.
- I. In accordance with the NCDWQ Wetlands Rules {15A NCAC 2H.0506(b)(6)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation becomes required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the NCDWQ Wetlands Rules {15A NCAC 2H.0506 (h)(3)}, the Wetland Restoration Program may be available for use as stream mitigation.
- J. Sediment and erosion control measures should not be placed in wetlands.
- K. The 401 Water Quality Certification application will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into the creek. Instead, stormwater should be designed to drain to a properly designed stormwater detention facility/apparatus.
- L. While the use of National Wetland Inventory (NWI) maps and soil surveys is a useful office tool, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Cynthia Van Der Wiele at (919) 733.5715.

pc: Steve Lund, Corps of Engineers  
Marella Buncick, USFWS  
David Cox, NCWRC  
File Copy  
Central Files

**INTERGOVERNMENTAL REVIEW – PROJECT COMMENTS**

Project Number: 00E0514 Due Date: 5-25-00

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
<input type="checkbox"/> Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
<input type="checkbox"/> NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
<input type="checkbox"/> Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
<input type="checkbox"/> Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
<input checked="" type="checkbox"/> Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
<input type="checkbox"/> Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC. (2Q.0100, 2Q.0300, 2H.0600)	N/A	60 days
<input type="checkbox"/> Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
<input type="checkbox"/> Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 2D.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-733-0820.		
<input type="checkbox"/> Complex Source Permit required under 15 A NCAC 2D.0800		
<input type="checkbox"/> The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (land Quality Sect.) At least 30 days before beginning activity. A fee of \$30 for the first acre and \$2000 for each additional acre or part must accompany the plan.		20 days (30 days)
<input checked="" type="checkbox"/> The Sedimentation Pollution control Act of 1973 must be addressed with respect to the referenced Local Ordinance.		(30 days)
<input type="checkbox"/> Mining Permit	On-site inspection usual. Surety bond filed with ENR. Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
<input type="checkbox"/> North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
<input type="checkbox"/> Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
<input type="checkbox"/> Oil Refining Facilities	N/A	90-120 days (N/A)
<input type="checkbox"/> Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of \$200.00 must accompany the application. An additional processing fee based on a percentage of the total project cost will be required upon completion.	30 days (60 days)

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
<input type="checkbox"/>	Permit to drill exploratory oil or gas well	File surety bond of \$5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days (N/A)
<input type="checkbox"/>	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days (N/A)
<input type="checkbox"/>	State Lakes Construction Permit	Application fee based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days (N/A)
<input type="checkbox"/>	401 Water Quality Certification	N/A	60 days (130 days)
<input type="checkbox"/>	CAMA Permit for MAJOR development	\$250.00 fee must accompany application	55 days (150 days)
<input type="checkbox"/>	CAMA Permit for MINOR development	\$50.00 fee must accompany application	22 days (25 days)
<input type="checkbox"/>	Several geodetic monuments are located in or near the project area. If any monuments need to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687, Raleigh, NC 27611		
<input type="checkbox"/>	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
<input type="checkbox"/>	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
<input type="checkbox"/>	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
*	Other comments (attach additional pages as necessary, being certain to cite comment authority)		

## REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Asheville Regional Office<br>59 Woodfin Place<br>Asheville, NC 28801<br>(704) 251-6208             | <input type="checkbox"/> Fayetteville Regional Office<br>Suite 714 Wachovia Building<br>Fayetteville, NC 28301<br>(919) 486-1541 |
| <input type="checkbox"/> Mooresville Regional Office<br>919 North Main Street, P.O. Box 950<br>Mooresville, NC 28115<br>(704) 663-1699 | <input type="checkbox"/> Raleigh Regional Office<br>3800 Barrett Drive, Suite 101<br>Raleigh, NC 27609<br>(919) 571-4700         |
| <input type="checkbox"/> Washington Regional Office<br>943 Washington Square Mall<br>Washington, NC 27889<br>919) 946-6481             | <input type="checkbox"/> Wilmington Regional Office<br>127 Cardinal Drive Extension<br>Wilmington, NC 28405<br>(919) 395-3900    |
| <input type="checkbox"/> Winston-Salem Regional Office<br>585 Waughtown St.<br>Winston-Salem, NC 27107<br>(910) 771-4600               |  |

NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES



JAMES B. HUNT JR.  
GOVERNOR

BILL HOLMAN  
SECRETARY

MEMORANDUM

TO: Chrys Baggett  
State Clearinghouse

FROM: Melba McGee  
Project Review Coordinator

RE: 00-E-0514 Scoping NC 209 Improvements, Haywood  
County

DATE: May 31, 2000

The Department of Environment and Natural Resources has reviewed the proposed project. The attached comments are a result of this review. More specific comments will be provided during the environmental review process.

Thank you for the opportunity to respond. If during the preparation of the environmental document, additional information is needed, the applicant is encouraged to notify our respective divisions.

Attachments

RECEIVED

MAY 31 2000

N.C. STATE CLEARINGHOUSE





North Carolina  
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

June 1, 2000

Mr. Karen Capps  
N.C. Dept. of Transportation  
Project Dev. & Env. Anal. Branch  
Transportation Building  
Raleigh, NC 27603

Dear Mr. Capps:

Re: SCH File # 00-E-4220-0514; Scoping Proposed Improvements to NC 209 from 0.2 Mile North of US 19-23-74 to Just North of SR 1523, Haywood County; TIP #R-4047

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter are comments made by agencies reviewing this document.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

Sincerely,

A handwritten signature in black ink that reads "Chrys Baggett".

Ms. Chrys Baggett  
Environmental Policy Act Coordinator

Attachments

cc: Region A

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality

CS14



James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Kerr T. Stevens, Director

May 30, 2000

MEMORANDUM

TO: Melba McGee, Environmental Coordinator  
Office of Legislative and Intergovernmental Affairs

THROUGH: John R. Dorney *JRD*

FROM: Cynthia F. Van Der Wiele, NC Division of Water Quality *cvdw*

SUBJECT: Scoping comments on the proposed improvements to NC 209 from 0.2 mi.  
North of US 19/23/74 to SR 1523 in Haywood County, State Project No.  
8.1944301, TIP R-4047.

In reply to your correspondence dated April 3, 2000 in which you requested comments for the referenced project, preliminary analysis of the project reveals no potential for direct impacts to perennial streams or jurisdictional wetlands in the project area. Lake Junaluska and Richlands Creek are noted to be adjacent to the project site and have a water quality classification of B. However, in the event that the project corridor shifts, the Division of Water Quality requests that NCDOT send notification of any proposed impacts to wetlands and streams with corresponding mapping.

The NCDWQ appreciates the opportunity to provide comments on your project. If you have any questions, please call me at 733.5715.

CVDW/cvdw

pc: File Copy  
Central Files

NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES



JAMES B. HUNT JR.  
GOVERNOR

BILL HOLMAN  
SECRETARY

MEMORANDUM

TO: Chrys Baggett

FROM: Melba McGee  
Project Review Coordinator

RE: #00E-0514

DATE: June 6, 2000

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

Attachment

RECEIVED

JUN 8 2000

N.C. STATE CLEARINGHOUSE



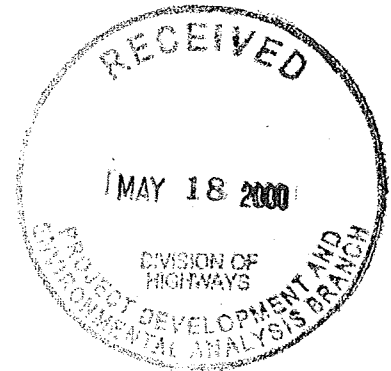
Copy

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality




James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Kerr T. Stevens, Director

May 11, 2000



MEMORANDUM

TO: William D. Gilmore, P.E., Manager, NCDOT  
Project Development & Environmental Analysis

THROUGH: John R. Dorney 

FROM: Cynthia F. Van Der Wiele, NC Division of Water Quality

SUBJECT: Scoping comments on the proposed improvements to NC 209 from 0.2 mi.  
North of US 19/23/74 to SR 1523 in Haywood County, State Project No.  
8.1944301, TIP R-4047.

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The NCDWQ appreciates the opportunity to provide comments on your project. If you have any questions, please call me at 733.5715.

CVDW/cvdw

pc: Steve Lund, Corps of Engineers  
Mark Cantrell, USFWS  
David Cox, NCWRC  
File Copy  
Central Files



COMMON NAME	SCIENTIFIC NAME	STATUS
Fraser fir	<i>Abies fraseri</i>	FSC
Piratebush	<i>Buckleya disticophylla</i>	FSC
Mountain bittercress	<i>Cardamine clematitidis</i>	FSC
Manhart's sedge	<i>Carex manhartii</i>	FSC
Tall larkspur	<i>Delphinium exaltatum</i>	FSC*
Glade spurge	<i>Euphorbia purpurea</i>	FSC
Smoky Mountain manna grass	<i>Glyceria nubigena</i>	FSC
Small-whorled pogonia	<i>Isotria medeoloides</i>	Threatened
Butternut	<i>Juglans cinerea</i>	FSC
Fraser's loosestrife	<i>Lysimachia fraseri</i>	FSC
Rugel's ragwort	<i>Rugelia nudicaulis</i>	FSC
Carolina saxifrage	<i>Saxifraga caroliniana</i>	FSC
Mountain catchfly	<i>Silene ovata</i>	FSC
Alabama least trillium	<i>Trillium pusillum</i> var. 1	FSC
<b>Nonvascular Plants</b>		
Rock gnome lichen	<i>Gymnoderma lineare</i>	Endangered
A liverwort	<i>Plagiochila sharpii</i>	FSC
A liverwort	<i>Plagiochila sullivanii</i> var. <i>sullivanii</i>	FSC
A liverwort	<i>Sphenolobopsis pearsonii</i>	FSC

**KEY:**

Status	Definition
Endangered	A taxon "in danger of extinction throughout all or a significant portion of its range."
Threatened	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
FSC	A Federal species of concern--a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
T(S/A)	Threatened due to similarity of appearance (e.g., American alligator)--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

Species with 1, 2, 3, or 4 asterisks behind them indicate historic, obscure, or incidental records.

\*Historic record - the species was last observed in the county more than 50 years ago.

\*\*Obscure record - the date and/or location of observation is uncertain.

\*\*\*Incidental/migrant record - the species was observed outside of its normal range or habitat.

\*\*\*\*Historic record - obscure and incidental record.

<sup>1</sup>In the November 4, 1997, *Federal Register* (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land-management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

## ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND FEDERAL SPECIES OF CONCERN, HAYWOOD COUNTY, NORTH CAROLINA

This list was adapted from the North Carolina Natural Heritage Program's County Species List. It is a listing, for Haywood County, of North Carolina's federally listed and proposed endangered, threatened, and candidate species and Federal species of concern (for a complete list of rare species in the state, please contact the North Carolina Natural Heritage Program). The information in this list is compiled from a variety of sources, including field surveys, museums and herbariums, literature, and personal communications. The North Carolina Natural Heritage Program's database is dynamic, with new records being added and old records being revised as new information is received. Please note that this list cannot be considered a definitive record of listed species and Federal species of concern, and it should not be considered a substitute for field surveys.

**Critical habitat:** Critical habitat is noted, with a description, for the counties where it is designated.

**Aquatic species:** Fishes and aquatic invertebrates are noted for counties where they are known to occur. However, projects may have effects on downstream aquatic systems in adjacent counties.

COMMON NAME	SCIENTIFIC NAME	STATUS
-------------	-----------------	--------

### HAYWOOD COUNTY

#### Vertebrates

Southern Appalachian saw-whet owl	<i>Aegolius acadicus</i>	FSC
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Olive-sided flycatcher	<i>Contopus borealis</i>	FSC
Hellbender	<i>Cryptobranchus alleganiensis</i>	FSC
Cerulean warbler	<i>Dendroica cerulea</i>	FSC
Eastern cougar	<i>Felis concolor couguar</i>	Endangered*
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Southern Appalachian red crossbill	<i>Loxia curvirostra</i>	FSC
Southern rock vole	<i>Microtus chrotorrhinus carolinensis</i>	FSC
Southern Appalachian woodrat	<i>Neotoma floridana haematorea</i>	FSC
Alleghany woodrat	<i>Neotoma magister</i>	FSC
Southern Appalachian black-capped chickadee	<i>Parus atricapillus praticus</i>	FSC
Southern water shrew	<i>Sorex palustris punctulatus</i>	FSC
Southern Appalachian yellow-bellied sapsucker	<i>Sphyrapicus varius appalaciensis</i>	FSC
Appalachian cottontail	<i>Sylvilagus obscurus</i>	FSC
Appalachian Bewick's wren	<i>Thryomanes bewickii altus</i>	FSC

#### Invertebrates

Appalachian elktoe	<i>Alasmidonta raveneliana</i>	Endangered
Tawny crescent butterfly	<i>Phyciodes batesii maconensis</i>	FSC*
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC

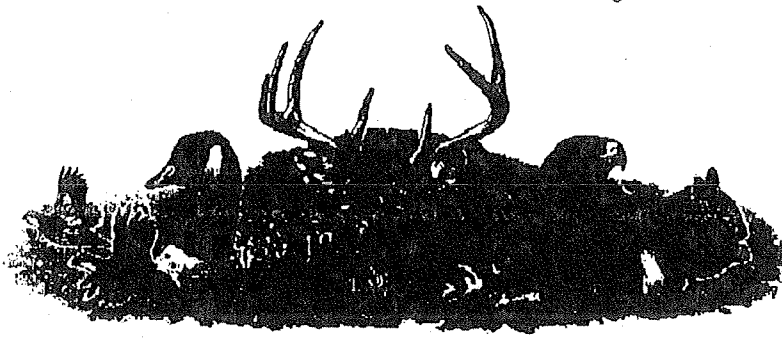
#### Vascular Plants

cc:

Mr. Steve Lund, U.S. Army Corps of Engineers, Asheville Regulatory Field Office, 151 Patton Avenue, Room 143, Asheville, NC 28801-5006

Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC 27699-1621

Mr. Owen Anderson, Eastern Piedmont Region Coordinator, North Carolina Wildlife Resources Commission, 1142 I-85 Service Road, Creedmoor, NC 27522



☒ North Carolina Wildlife Resources Commission ☒

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391  
Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Melba McGee  
Office of Legislative and Intergovernmental Affairs, DENR

FROM: David Cox, Highway Project Coordinator  
Habitat Conservation Program

DATE: May 25, 2000

SUBJECT: Request for information from the N. C. Department of Transportation (NCDOT) regarding fish and wildlife concerns for the NC 209 improvements, from US 19-23-74 near Lake Junaluska to just north of SR 1523, Haywood County, North Carolina. TIP No. R-4047, SCH Project No. 00-E-0514.

This memorandum responds to a request from Mr. William D. Gilmore of the NCDOT for our concerns regarding impacts on fish and wildlife resources resulting from the subject project. Biologists on the staff of the N. C. Wildlife Resources Commission (NCWRC) have reviewed the proposed improvements. Our comments are provided in accordance with certain provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

At this time, the NCWRC has no specific recommendations or concerns regarding the subject project. However, to help facilitate document preparation and the review process, our general informational needs are outlined below:

1. Description of fishery and wildlife resources within the project area, including a listing of federally or state designated threatened, endangered, or special concern species. Potential borrow areas to be used for project construction should be included in the inventories. A listing of designated plant species can be developed through consultation with:

The Natural Heritage Program  
N. C. Division of Parks and Recreation  
1615 Mail Service Center  
Raleigh, N. C. 27699-1615  
(919) 733-7795

Memo

2

May 25, 2000

and,

NCDA Plant Conservation Program  
P. O. Box 27647  
Raleigh, N. C. 27611  
(919) 733-3610

2. Description of any streams or wetlands affected by the project. The need for channelizing or relocating portions of streams crossed and the extent of such activities.
3. Cover type maps showing wetland acreages impacted by the project. Wetland acreages should include all project-related areas that may undergo hydrologic change as a result of ditching, other drainage, or filling for project construction. Wetland identification may be accomplished through coordination with the U. S. Army Corps of Engineers (COE). If the COE is not consulted, the person delineating wetlands should be identified and criteria listed.
4. Cover type maps showing acreages of upland wildlife habitat impacted by the proposed project. Potential borrow sites should be included.
5. The extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat (wetlands or uplands).
6. Mitigation for avoiding, minimizing or compensating for direct and indirect degradation in habitat quality as well as quantitative losses.
7. A cumulative impact assessment section which analyzes the environmental effects of highway construction and quantifies the contribution of this individual project to environmental degradation.
8. A discussion of the probable impacts on natural resources which will result from secondary development facilitated by the improved road access.
9. If construction of this facility is to be coordinated with other state, municipal, or private development projects, a description of these projects should be included in the environmental document, and all project sponsors should be identified.

Thank you for the opportunity to provide input in the early planning stages for this project. If we can further assist your office, please contact me at (919) 528-9886.

Karen  
Capps



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1499

February 1, 2001

Mr. William D. Gilmore, P. E., Manager  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

NC 209 FROM US 19-23-74 TO JUST NORTH OF SR 1523, FEDERAL AID NO. STP-209(2),  
STATE PROJECT NO. 8.1944301, TIP NO. R-4047, HAYWOOD COUNTY, NORTH  
CAROLINA

Thank you for informing us, by letter of December 19, 2000, of the expansion in scope of the NC 209 improvement project near Lake Junaluska and Richland Creek. From the project description, it appears that there would be no TVA approvals or other involvement with this project. However, if it appears that any obstructions are placed in the stream or floodplain areas, TVA would be interested in reviewing the project under Section 26a of the TVA Act.

We look forward to reviewing the Environmental Assessment/Finding of No Significant Impact re-evaluation document. Should you have any questions, please contact Harold M. Draper at (865) 632-6889 or [hmdraper@tva.gov](mailto:hmdraper@tva.gov).

Sincerely,

A handwritten signature in cursive script that reads "Jon M. Loney".

Jon M. Loney, Manager  
NEPA Administration  
Environmental Policy and Planning

cc: Mr. Nicholas L. Graf, Division Administrator  
Federal Highway Administration  
310 New Bern Avenue, Suite 400  
Raleigh, North Carolina 27601

CAVDS



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1499

May 18, 2000



Mr. William D. Gilmore, P. E., Manager  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
Post Office Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Gilmore:

NC 209 FROM 0.2 MILE NORTH OF US 19-23-74 TO JUST NORTH OF SR 1523,  
FEDERAL AID NO. STP-209(2), STATE PROJECT NO. 8.1944301, TIP NO. R-4047,  
HAYWOOD COUNTY, NORTH CAROLINA

TVA has reviewed information provided in your letter of April 3, 2000, on the proposed improvements to NC 209 at the Norfolk-Southern Railroad bridge. From the project description, it appears that there would be no TVA approvals or other involvement with this project. In addition, we are not aware of any new issues that need to be addressed since the original state Environmental Assessment/Finding of No Significant Impact was completed.

Should you have any questions, please contact Harold M. Draper at (865) 632-6889 or [hmdraper@tva.gov](mailto:hmdraper@tva.gov).

Sincerely,

Jon M. Loney, Manager  
NEPA Administration  
Environmental Policy and Planning

cc: Mr. Charles S. Boyd, Division Administrator  
Federal Highway Administration  
640 Grassmere Park, Suite 112  
Nashville, Tennessee 37211



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

June 9, 2000



Mr. William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

Subject: Proposed Improvements to NC 209 from 0.2 Mile North of US 19-23-74 to just North of SR 1523, Haywood County, North Carolina, F.A. No. STP-209(2), State Project No. 8.1944301, TIP No. R-4047

We have reviewed the subject project as requested by your letter of April 3, 2000 (response requested by early June), and are providing the following comments in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

The North Carolina Department of Transportation proposes to widen NC 209 to a three- or four-lane section from 0.2 mile north of US 19-23-74 to just north of SR 1523. This action also includes moving the existing Norfolk-Southern Railroad bridge and track southwest of its current location.

Enclosed is a list of species from Haywood County that are on the *Federal List of Endangered and Threatened Wildlife and Plants* and species of Federal concern that may occur in the project impact area. Although our records indicate no known locations of these species in the project area, we recommend surveying the area for them prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur to these species. Species of Federal concern are not legally protected under the Act and are not subject to any of its provisions, including Section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification. The presence or absence of these species in the project impact area should be addressed in the reevaluation of the Environmental Assessment/Finding of No Significant Impact prepared for this project.

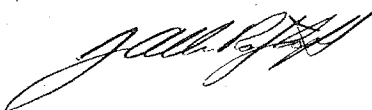


Based on our field review, it appears that the project area is primarily an urban, human-altered environment. The one small stream near the existing railroad trestle is heavily impacted by culverts and the existing development in the area. While it is not completely clear, it doesn't appear that this project will further impact the stream. However, the reevaluation document should contain the following information, if pertinent:

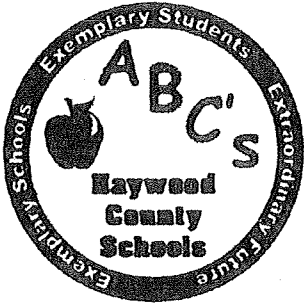
- (1) A description of the fishery and wildlife resources within existing and required additional rights-of-way and any areas, such as borrow areas, that may be affected directly or indirectly by the proposed road improvements.
- (2) The acreage and a description of wetlands that will be filled as a result of the proposed road improvements. Wetlands affected by the proposed project should be mapped in accordance with the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. We recommend contacting the U.S. Army Corps of Engineers to determine the need for a Section 404 Clean Water Act permit.
- (3) The extent (linear feet as well as discharge) of any water courses that will be impacted as a result of the proposed project. A description of any streams should include the classification (Rosgen 1995, 1996) and a description of the biotic resources.
- (4) An analysis of the crossing structures considered (i.e., spanning structure, culvert) and the rationale for choosing the preferred structure(s). We prefer stream crossings that span the bank-full width of the stream and do not impede natural stream functions or fish passage.
- (5) The mitigation measures that will be employed to avoid, eliminate, reduce, or compensate for habitat value losses (wetland, riverine, and upland) associated with any phase of the proposed project.

We appreciate the opportunity to provide these scoping comments and request that you continue to keep us informed as to the progress of this project. If you have questions about these comments, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning this project, please reference our Log Number 4-2-00-132.

Sincerely,

  
for Brian P. Cole  
State Supervisor

Enclosure



John McCracken  
Assistant Superintendent

Haywood County Schools  
1230 N. Main Street  
Waynesville, North Carolina 28786  
828/456-2400  
Fax 828/456-2438

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November 26, 2001

Ms. Karen B. Capps, P.E.  
4000 Graham Newton Road  
Raleigh, NC 27611

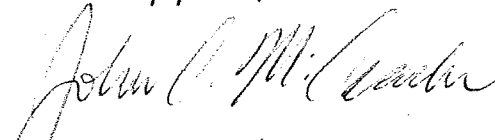
RE: Access Road  
Tuscola High School

Dear Ms. Capps:

Enclosed is the latest version of the design for the access road to Tuscola High School. The designer, Matt Bundy with David D. Smith Company, is talking with Rick Styles, District Engineer, about some additional changes the D.O.T. may request. I am hopeful that the funding for this project may be available by March or April, 2002, so construction can be done during the Spring and early Summer months.

Have you developed other recommendations which may affect this access road project?

Cordially yours,

  
John C. McCracken  
Assistant Superintendent



**APPENDIX C  
(COMBINED AIR &  
NOISE REPORT)**



Table A1

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: R-4047, NC 209/SR 1801, HAYWOOD CO. 2005

RUN: R-4047, NC 209/SR 1801, HAYWOOD CO. 2005

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S      VD = .0 CM/S      Z0 = 108. CM  
 U = 1.0 M/S      CLAS = 5 (E)      ATIM = 60. MINUTES

MIXH = 1000. M      AMB = 1.8 PPM      BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LINK COORDINATES (FT)	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. NB Approach	12.0	-1000.0	12.0	.0		1000.	360. AG	372.	17.7	.0	32.0	
2. NB LT	6.0	-36.0	2.1	-173.4		137.	182. AG	242.	100.0	.0	12.0	.73
3. NB RT	30.0	-36.0	30.0	-50.1		14.	180. AG	255.	100.0	.0	12.0	.09
4. NB THRU	12.0	-36.0	12.0	-66.7		31.	180. AG	255.	100.0	.0	12.0	.19
5. NB Departure	12.0	1000.0	12.0	1000.0		1000.	360. AG	151.	17.7	.0	32.0	
6. SB Approach	-12.0	1000.0	-12.0	.0		1000.	180. AG	151.	17.7	.0	32.0	
7. SB LT	.0	36.0	.0	48.2		12.	360. AG	622.	100.0	.0	24.0	.38
8. SB RT	-30.0	36.0	-28.3	170.9		135.	1. AG	305.	100.0	.0	12.0	1.05
9. SB THRU	-18.0	36.0	-18.0	52.8		17.	360. AG	305.	100.0	.0	12.0	.35
10. SB DEPT	-12.0	.0	-12.0	-1000.0		1000.	180. AG	372.	17.7	.0	32.0	
11. EB APPR	-1000.0	-18.0	.0	-18.0		1000.	90. AG	501.	17.7	.0	44.0	
12. EB LT	-42.0	.0	-146.4	.0		104.	270. AG	297.	100.0	.0	12.0	.95
13. EB THRU/RT	-42.0	-18.0	-101.4	-18.0		59.	270. AG	311.	100.0	.0	24.0	.24
14. EB DEPT	.0	-18.0	1000.0	-18.0		1000.	90. AG	644.	17.1	.0	44.0	
15. WB APPR	1000.0	18.0	.0	18.0		1000.	270. AG	644.	17.7	.0	44.0	
16. WB LT	42.0	.0	103.3	5.3		62.	85. AG	297.	100.0	.0	12.0	.76
17. WB THRU/RT	42.0	18.0	126.5	18.0		85.	90. AG	311.	100.0	.0	24.0	.35
18. WB DEPT	.0	18.0	-1000.0	18.0		1000.	270. AG	501.	17.7	.0	44.0	

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	87	2.0	283	1600	124.20	1	3
3. NB RT	120	92	2.0	28	1600	124.20	1	3
4. NB THRU	120	92	2.0	61	1600	124.20	1	3
7. SB LT	120	112	2.0	41	1600	124.20	1	3
8. SB RT	120	110	2.0	83	1600	124.20	1	3
9. SB THRU	120	110	2.0	28	1600	124.20	1	3
12. EB LT	120	107	2.0	113	1600	124.20	1	3
13. EB THRU/RT	120	56	2.0	388	1600	124.20	1	3
16. WB LT	120	107	2.0	90	1600	124.20	1	3
17. WB THRU/RT	120	56	2.0	553	1600	124.20	1	3

Table A1 (Cont'd)

RECEPTOR LOCATIONS

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* * * * *
RECEPTOR * * * * * COORDINATES (FT) * * * * *
* * * * * X * * * * * Y * * * * * Z * * * * *
* * * * *
1. REC 1 * * * * * 80.0 * * * * * 110.0 * * * * * 5.0 * * * * *
2. REC 2 * * * * * 160.0 * * * * * 110.0 * * * * * 5.0 * * * * *
3. REC 3 * * * * * -80.0 * * * * * 100.0 * * * * * 5.0 * * * * *
4. REC 4 * * * * * -160.0 * * * * * 100.0 * * * * * 5.0 * * * * *
5. REC 5 * * * * * 80.0 * * * * * -130.0 * * * * * 5.0 * * * * *
6. REC 6 * * * * * 160.0 * * * * * -130.0 * * * * * 5.0 * * * * *
7. REC 7 * * * * * 80.0 * * * * * -270.0 * * * * * 5.0 * * * * *
8. REC 8 * * * * * 90.0 * * * * * -400.0 * * * * * 5.0 * * * * *
9. REC 9 * * * * * -80.0 * * * * * -130.0 * * * * * 5.0 * * * * *
10. REC 10 * * * * * -160.0 * * * * * -130.0 * * * * * 5.0 * * * * *
11. REC 11 * * * * * -80.0 * * * * * -270.0 * * * * * 5.0 * * * * *
12. REC 12 * * * * * -90.0 * * * * * -400.0 * * * * * 5.0 * * * * *
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MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND \* CONCENTRATION  
 ANGLE \* (PPM)  
 (DEGR) \* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12

-----  
 THE HIGHEST CONCENTRATION IS 3.50 PPM AT 117 DEGREES FROM REC3 .

Table A2

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992  
 JOB: R-4047, NC 209/SR 1801, HAYWOOD CO. 2010  
 RUN: R-4047, NC 209/SR 1801, HAYWOOD CO. 2010

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 108. CM  
 U = 1.0 M/S CLAS = 5 (E) ATIM = 60. MINUTES  
 MIXH = 1000. M AMB = 1.8 PPM BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. NB Approach	12.0	-1000.0	12.0	.0	1000.	360. AG	564.	10.1	.0	32.0	
2. NB LT	.6.0	-36.0	-15.4	-800.9	765.	182. AG	122.	100.0	.0	12.0	1.12 38.9
3. NB RT	30.0	-36.0	30.0	-57.1	21.	180. AG	129.	100.0	.0	12.0	.13 1.1
4. NB THRU	12.0	-36.0	12.0	-81.3	45.	180. AG	129.	100.0	.0	12.0	.28 2.3
5. NB Departure	12.0	.0	12.0	1000.0	1000.	360. AG	228.	10.1	.0	32.0	
6. SB Approach	-12.0	1000.0	-12.0	.0	1000.	180. AG	228.	10.1	.0	32.0	
7. SB LT	.0	36.0	.0	263.0	227.	360. AG	322.	100.0	.0	24.0	2.31 11.5
8. SB RT	-30.0	36.0	-22.4	643.6	608.	1. AG	154.	100.0	.0	12.0	1.59 30.9
9. SB THRU	-18.0	36.0	-18.0	62.1	26.	360. AG	154.	100.0	.0	12.0	.53 1.3
10. SB DEPT	-12.0	.0	-12.0	-1000.0	1000.	180. AG	564.	10.1	.0	32.0	
11. EB APPR	-1000.0	-18.0	.0	-18.0	1000.	90. AG	761.	10.1	.0	44.0	
12. EB LT	-42.0	.0	-784.7	-1.1	743.	270. AG	150.	100.0	.0	12.0	1.48 37.7
13. EB THRU/RT	-42.0	-18.0	-131.4	-18.0	89.	270. AG	157.	100.0	.0	24.0	.37 4.5
14. EB DEPT	.0	-18.0	1000.0	-18.0	1000.	90. AG	982.	10.1	.0	44.0	
15. WB APPR	1000.0	18.0	.0	18.0	1000.	270. AG	982.	10.1	.0	44.0	
16. WB LT	42.0	.0	359.4	27.5	319.	85. AG	150.	100.0	.0	12.0	1.15 16.2
17. WB THRU/RT	18.0	18.0	171.2	18.0	129.	90. AG	157.	100.0	.0	24.0	.53 6.6
18. WB DEPT	.0	18.0	-1000.0	18.0	1000.	270. AG	761.	10.1	.0	44.0	

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	87	2.0	432	1600	62.60	1	3
3. NB RT	120	92	2.0	42	1600	62.60	1	3
4. NB THRU	120	90	2.0	90	1600	62.60	1	3
7. SB LT	120	115	2.0	60	1600	62.60	1	3
8. SB RT	120	110	2.0	126	1600	62.60	1	3
9. SB THRU	120	110	2.0	42	1600	62.60	1	3
12. EB LT	120	107	2.0	176	1600	62.60	1	3
13. EB THRU/RT	120	56	2.0	585	1600	62.60	1	3
16. WB LT	120	107	2.0	137	1600	62.60	1	3
17. WB THRU/RT	120	56	2.0	845	1600	62.60	1	3



Table A2 (Cont'd)

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. REC 1	80.0	110.0	5.0
2. REC 2	160.0	110.0	5.0
3. REC 3	-80.0	100.0	5.0
4. REC 4	-160.0	100.0	5.0
5. REC 5	80.0	-130.0	5.0
6. REC 6	160.0	-130.0	5.0
7. REC 7	80.0	-270.0	5.0
8. REC 8	90.0	-400.0	5.0
9. REC 9	-80.0	-130.0	5.0
10. REC 10	-160.0	-130.0	5.0
11. REC 11	-80.0	-270.0	5.0
12. REC 12	-90.0	-400.0	5.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND \* CONCENTRATION  
 ANGLE \* (PPM)  
 (DEGR)\* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12

THE HIGHEST CONCENTRATION IS 3.50 PPM AT 115 DEGREES FROM REC3 .

Table A3

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992  
 JOB: R-4047, NC 209/SR 1801, HAYWOOD CO. 2025  
 RUN: R-4047, NC 209/SR 1801, HAYWOOD CO. 2025

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S      VD = .0 CM/S      Z0 = 108. CM  
 U = 1.0 M/S      CLAS = 5 (E)      ATIM = 60. MINUTES      MIXH = 1000. M      AMB = 1.8 PPM      BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LINK COORDINATES (FT)	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. NB Approach	12.0	-1000.0	12.0	.0		1000.	360. AG	564.	10.1	.0	32.0	
2. NB LT	6.0	-36.0	-15.4	-800.9	*	765.	182. AG	122.	100.0	.0	12.0	1.12 38.9
3. NB RT	30.0	-36.0	30.0	-57.1	*	21.	180. AG	129.	100.0	.0	12.0	.13 1.1
4. NB THRU	12.0	-36.0	12.0	-81.3	*	45.	180. AG	129.	100.0	.0	12.0	.28 2.3
5. NB Departure	12.0	.0	12.0	1000.0	*	1000.	360. AG	228.	10.1	.0	32.0	
6. SB Approach	-12.0	1000.0	-12.0	.0		1000.	180. AG	228.	10.1	.0	32.0	
7. SB LT	.0	36.0	.0	133.8	*	98.	360. AG	327.	100.0	.0	24.0	*** 5.0
8. SB RT	-30.0	36.0	-17.1	1068.9	*	1033.	1. AG	158.	100.0	.0	12.0	3.23 52.5
9. SB THRU	-18.0	36.0	-18.0	124.4	*	88.	360. AG	158.	100.0	.0	12.0	1.08 4.5
10. SB DEPT	-12.0	.0	-12.0	-1000.0	*	1000.	180. AG	564.	10.1	.0	32.0	
11. EB APPR	-1000.0	-18.0	.0	-18.0	*	1000.	90. AG	761.	10.1	.0	44.0	
12. EB LT	-42.0	.0	-784.7	-1.1	*	743.	270. AG	150.	100.0	.0	12.0	1.48 37.7
13. EB THRU/RT	-42.0	-18.0	-131.4	-18.0	*	89.	270. AG	157.	100.0	.0	24.0	.37 4.5
14. EB DEPT	.0	-18.0	1000.0	-18.0	*	1000.	90. AG	982.	10.1	.0	44.0	
15. WB APPR	1000.0	18.0	.0	18.0	*	1000.	270. AG	982.	10.1	.0	44.0	
16. WB LT	42.0	.0	359.4	27.5	*	319.	85. AG	150.	100.0	.0	12.0	1.15 16.2
17. WB THRU/RT	42.0	18.0	171.2	18.0	*	129.	90. AG	157.	100.0	.0	24.0	.53 6.6
18. WB DEPT	.0	18.0	-1000.0	18.0	*	1000.	270. AG	761.	10.1	.0	44.0	

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	87	2.0	432	1600	62.60	1	3
3. NB RT	120	92	2.0	42	1600	62.60	1	3
4. NB THRU	120	92	2.0	90	1600	62.60	1	3
7. SB LT	120	117	2.0	60	1600	62.60	1	3
8. SB RT	120	113	2.0	126	1600	62.60	1	3
9. SB THRU	120	113	2.0	42	1600	62.60	1	3
12. EB LT	120	107	2.0	176	1600	62.60	1	3
13. EB THRU/RT	120	56	2.0	585	1600	62.60	1	3
16. WB LT	120	107	2.0	137	1600	62.60	1	3
17. WB THRU/RT	120	56	2.0	845	1600	62.60	1	3

Table A3 (Cont'd)

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. REC 1	80.0	110.0	5.0
2. REC 2	160.0	110.0	5.0
3. REC 3	-80.0	100.0	5.0
4. REC 4	-160.0	100.0	5.0
5. REC 5	80.0	-130.0	5.0
6. REC 6	160.0	-130.0	5.0
7. REC 7	80.0	-270.0	5.0
8. REC 8	90.0	-400.0	5.0
9. REC 9	-80.0	-130.0	5.0
10. REC 10	-160.0	-130.0	5.0
11. REC 11	-80.0	-270.0	5.0
12. REC 12	-90.0	-400.0	5.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND \* CONCENTRATION  
ANGLE \* (PPM)

(DEGR)\* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12

THE HIGHEST CONCENTRATION IS 3.70 PPM AT 111 DEGREES FROM REC3 .

**Figure N1**  
**Project Location & Ambient Measurement Sites**  
**NC 209 Widening**  
**Haywood County**

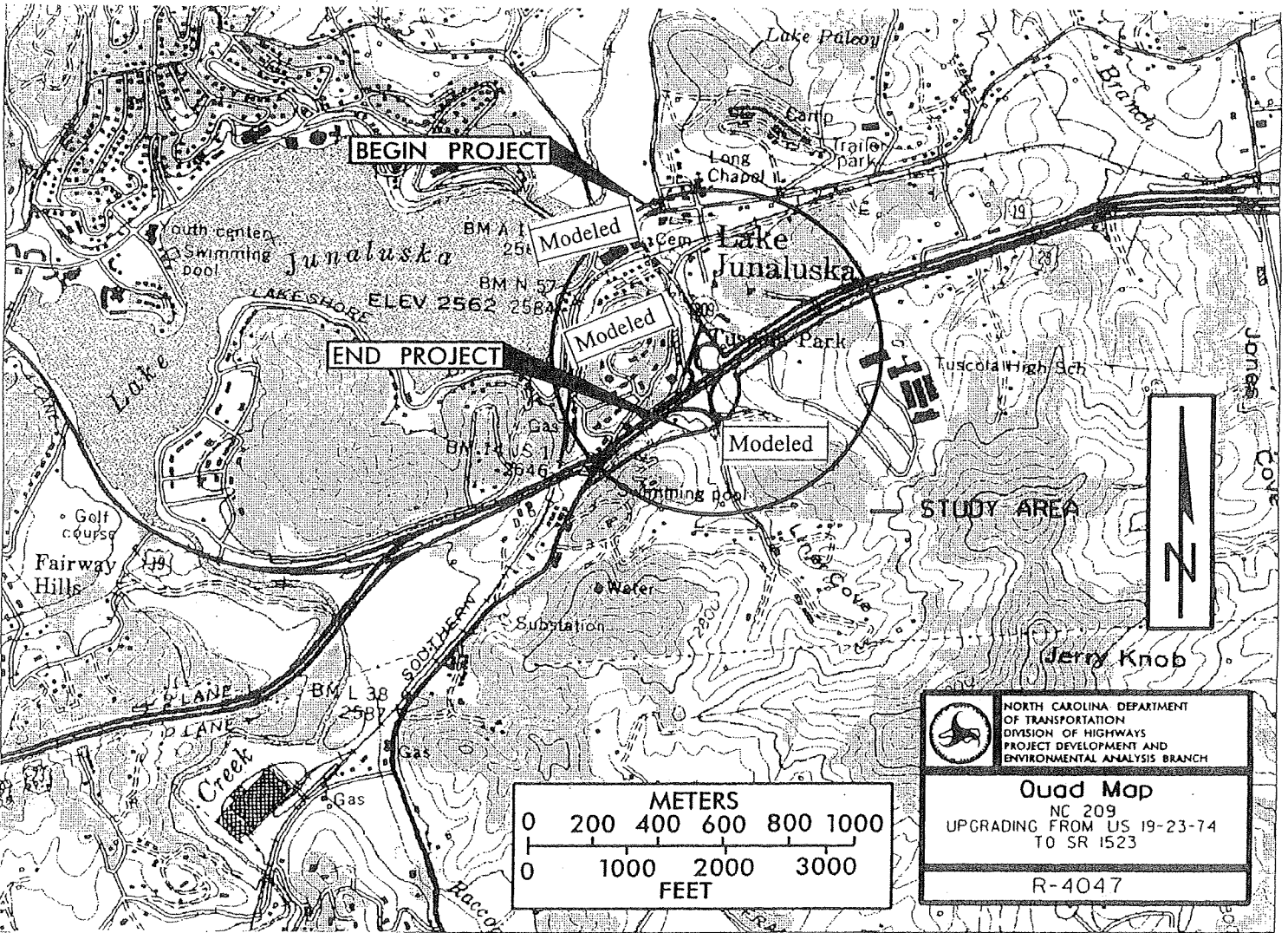


TABLE N1

HEARING: SOUNDS BOMBARDING US DAILY

140	Shotgun blast, jet 30m away at takeoff	PAIN
	Motor test chamber	HUMAN EAR PAIN THRESHOLD
130	-----	
	Firecrackers	
120	Severe thunder, pneumatic jackhammer	
	Hockey crowd	
	Amplified rock music	UNCOMFORTABLY LOUD
110	-----	
	Textile loom	
100	Subway train, elevated train, farm tractor	
	Power lawn mower, newspaper press	
	Heavy city traffic, noisy factory	LOUD
90	-----	
D	Diesel truck 65 kmph at 15m away	
E	80 Crowded restaurant, garbage disposal	
C	Average factory, vacuum cleaner	
I	Passenger car 80 kmph at 15m away	MODERATELY LOUD
B	70	-----
E	Quiet typewriter	
L	60 Singing birds, window air-conditioner	
S	Quiet automobile	
	Normal conversation, average office	QUIET
50	-----	
	Household refrigerator	
	Quiet office	VERY QUIET
40	-----	
	Average home	
30	Dripping faucet	
	Whisper at 1.5m away	
20	Light rainfall, rustle of leaves	
		AVERAGE PERSON'S THRESHOLD OF HEARING
	Whisper	JUST AUDIBLE
10	-----	
0	THRESHOLD FOR ACUTE HEARING	

Sources: World Book, Rand McNally Atlas of the Human Body, Encyclopedia America, "Industrial Noise and Hearing Conversation" by J. B. Olishifski and E. R. Harford (Researched by N. Jane Hunt and published in the Chicago Tribune in an illustrated graphic by Tom Heinz.)

TABLE N2

NOISE ABATEMENT CRITERIA

CRITERIA FOR EACH FHWA ACTIVITY CATEGORY		
HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)		
Activity Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities are essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Title 23 Code of Federal Regulations (CFR) Part 772, U. S. Department of Transportation, Federal Highway Administration.

CRITERIA FOR SUBSTANTIAL INCREASE	
HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)	
Existing Noise Level in Leq(h)	Increase in dBA from Existing Noise Levels to Future Noise Levels
<= 50	>= 15
51	>= 14
52	>= 13
53	>= 12
54	>= 11
>= 55	>= 10

Source: North Carolina Department of Transportation Noise Abatement Policy (09/02/04).

TABLE 3  
 AMBIENT NOISE LEVELS (Leq)  
 NC 209, Widening Haywood County, TIP # R-4047

SITE	LOCATION	DESCRIPTION	NOISE LEVEL (dBA)
1	NC 209 North; SR 1801 to SR 1646	Modeled	69.3
2	NC 209 North; SR 1646 to SR 1523	Modeled	65.1
3	NC 209 North; SR 1523 to End of Project	Modeled	66.1
BG	"Background" for the entire project area	Modeled	45.0

NOTE: The ambient noise level sites were measured at 15 meters from edge of pavement of the nearest lane of traffic.

TRAFFIC NOISE EXPOSURES  
 NC 209, Widening and Interchange with US 19-23-74  
 Haywood County, TIP # R-4047

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
					NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	
NC 209; SR 1801 TO SR 1646										
1	Business	C	SR 1001	45	-L-	340.0 R	-	-	47	+ 2
2	Residence	B	"	55	"	110.0 R	-	-	60	+ 5
3	Residence	B	"	54	"	125.0 R	-	-	59	+ 5
NC 209; SR 1646 TO SR 1523										
4	Business	C	NC 209	48	-L-	140.0 R	-	-	56	+ 8
6	Business	C	"	47	"	160.0 L	-	-	54	+ 7
7	Residence	B	"	46	"	180.0 R	-	-	53	+ 7
8	Residence	B	"	57	"	60.0 R	-	-	65	+ 8
9	Residence	B	"	51	"	110.0 R	-	-	58	+ 7
10	Residence	B	"	45	"	195.0 L	-	-	52	+ 7
11	Residence	B	"	51	"	110.0 L	-	-	58	+ 7
12	Residence	B	"	58	"	55.0 L	-	-	* 66	+ 8
13	Residence	B	"	53	"	90.0 R	-	-	60	+ 7
14	Residence	B	"	47	"	160.0 R	-	-	54	+ 7
15	Business	C	"	52	"	100.0 R	-	-	59	+ 7
NC 209; SR 1523 to End of Project										
16	Residence	B	NC 209	48	-L-	120.0 R	-	-	56	+ 8
17	Business	C	"	53	"	75.0 R	-	-	60	+ 7
18	Business	C	"	52	"	85.0 L	-	-	59	+ 7
19	Business	C	"	54	"	70.0 L	-	-	61	+ 7
20	Business	C	"	57	"	50.0 R	-	-	R/W	-
21	Residence	B	"	47	"	130.0 R	-	-	55	+ 8
22	Residence	B	"	50	"	105.0 R	-	-	57	+ 7
23	Business	C	"	60	"	40.0 L	-	-	R/W	-

-L- Denotes proposed roadway's noise level contribution and -Y- denotes contributions from other roadways.  
 "\*\*" Denotes a noise impact per 23 CFR Part 772 and Category E noise levels shown as exterior/interior (68/48).



TABLE N4  
 TRAFFIC NOISE EXPOSURES  
 NC 209, Haywood County, TIP #R-4047  
 No Build

RECEPTOR INFORMATION ID#	LAND USE CATEGORY	NEAREST ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS		NOISE LEVEL INCREASE	
				NAME	CL DIST(FT)	-L-	-Y-		MAXIMUM
NC 209; SR 1801 TO SR 1646									
1	Business	NC 209	45	-L-	340.0 R	-	-	45	+ 0
2	Residence	"	55	"	110.0 R	-	-	58	+ 3
3	Residence	"	54	"	125.0 R	-	-	56	+ 2
NC 209; SR 1801 TO SR 1646									
4	Business	NC 209	48	-L-	140.0 R	-	-	49	+ 1
5	Business	"	55	"	80.0 R	-	-	55	+ 0
6	Business	"	47	"	160.0 L	-	-	48	+ 1
7	Residence	"	46	"	180.0 R	-	-	46	+ 0
8	Residence	"	57	"	60.0 R	-	-	58	+ 1
9	Residence	"	51	"	110.0 R	-	-	52	+ 1
10	Residence	"	45	"	195.0 L	-	-	46	+ 1
11	Residence	"	51	"	110.0 L	-	-	52	+ 1
12	Residence	"	58	"	55.0 L	-	-	58	+ 0
13	Residence	"	53	"	90.0 R	-	-	54	+ 1
14	Residence	"	47	"	160.0 R	-	-	48	+ 1
15	Business	"	52	"	100.0 R	-	-	53	+ 1
NC 209; SR 1523 to End of Project									
16	Residence	NC 209	48	-L-	120.0 R	-	-	49	+ 1
17	Business	"	53	"	75.0 R	-	-	53	+ 0
18	Business	"	52	"	85.0 L	-	-	52	+ 0
19	Business	"	54	"	70.0 L	-	-	54	+ 0
20	Business	"	57	"	50.0 R	-	-	58	+ 1
21	Residence	"	47	"	130.0 R	-	-	48	+ 1
22	Residence	"	50	"	105.0 R	-	-	50	+ 0
23	Business	"	60	"	40.0 L	-	-	60	+ 0

-L- Denotes proposed roadway's noise level contribution and -Y- denotes contributions from other roadways.  
 "\*" Denotes a noise impact per 23 CFR Part 772 and Category E noise levels shown as exterior/interior (68/48).

TABLE NS  
 FHWA NOISE ABATEMENT CRITERIA SUMMARY  
 NC 209, Haywood County, TTP # R-4047

DESCRIPTION BULD	Leq NOISE LEVELS (DBA)			MAXIMUM CONTOUR DISTANCES		APPROXIMATE # OF IMPACTED RECEPTORS ACCORDING TO TITLE 23 CFR PART 772				
	50ft	100ft	200ft	72 DBA	67 DBA	A	B	C	D	E
1- NC 209, SR 1801 to SR 1646	72.8	68.7	62.9	81.2	146.4	0	0	0	0	0
2- NC 209, SR 1646 to SR 1523	70.9	66.8	61.0	58.7	120.5	0	1	0	0	0
3- NC 209, SR 1523 to The End of Project	69.5	65.3	59.6	<49.0	99.4	0	0	0	0	0
TOTALS ---->						0	1	0	0	0
DESCRIPTION NO BULD	Leq NOISE LEVELS (DBA)			MAXIMUM CONTOUR DISTANCES		APPROXIMATE # OF IMPACTED RECEPTORS ACCORDING TO TITLE 23 CFR PART 772				
	50ft	100ft	200ft	72 DBA	67 DBA	A	B	C	D	E
1- NC 209, SR 1801 to SR 1646	71.7	67.7	61.3	69.2	131.8	0	0	0	0	0
2- NC 209, SR 1646 to SR 1523	65.5	60.0	55.9	<43.0	55.4	0	0	0	0	0
3- NC 209, SR 1523 to The End of Project	66.4	60.4	54.3	<37.0	56.5	0	0	0	0	0
TOTALS ---->						0	0	0	0	0

1. 50ft, 100ft, and 200ft distances are measured from the center of nearest travel lane.
2. 72 dBA and 67 dBA contour distances are measured from the center of proposed roadway.

**TABLE N6**  
**TRAFFIC NOISE LEVEL INCREASE SUMMARY**  
**NC 209, Haywood County, TIP # R-4047**

DESCRIPTION BUILD	RECEPTOR EXTERIOR NOISE LEVEL INCREASES						SUBSTANTIAL NOISE LEVEL INCREASE "1"	IMPACTS DUE TO BOTH CRITERIA "2"
	<=0	1-4	5-9	10-14	15-19	20-24		
1- NC 209, SR 1801 to SR 1646	0	1	2	0	0	0	0	0
2- NC 209, SR 1646 to SR 1523	0	0	11	0	0	0	0	0
3- NC 209, SR 1523 to The End of Project	0	0	6	0	0	0	0	0
TOTALS --->	0	1	19	0	0	0	0	0

DESCRIPTION NO BUILD	RECEPTOR EXTERIOR NOISE LEVEL INCREASES						SUBSTANTIAL NOISE LEVEL INCREASE "1"	IMPACTS DUE TO BOTH CRITERIA "2"
	<=0	1-4	5-9	10-14	15-19	20-24		
1- NC 209, SR 1801 to SR 1646	1	2	0	0	0	0	0	0
2- NC 209, SR 1646 to SR 1523	2	9	0	0	0	0	0	0
3- NC 209, SR 1523 to The End of Project	5	4	0	0	0	0	0	0
TOTALS --->	8	15	0	0	0	0	0	0

"1" As defined by only a substantial increase (See bottom of TABLE N2).  
"2" As defined by both criteria in TABLE N2.

TABLE N2

NOISE ABATEMENT CRITERIA

CRITERIA FOR EACH FHWA ACTIVITY CATEGORY		
HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)		
Activity Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities are essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Title 23 Code of Federal Regulations (CFR) Part 772, U. S. Department of Transportation, Federal Highway Administration.

CRITERIA FOR SUBSTANTIAL INCREASE	
HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)	
Existing Noise Level in Leq(h)	Increase in dBA from Existing Noise Levels to Future Noise Levels
<= 50	>= 15
51	>= 14
52	>= 13
53	>= 12
54	>= 11
>= 55	>= 10

Source: North Carolina Department of Transportation Noise Abatement Policy (09/02/04).

TABLE 3  
 AMBIENT NOISE LEVELS (Leq)  
 NC 209, Widening Haywood County, TIP # R-4047

SITE	LOCATION	DESCRIPTION	NOISE LEVEL (dBA)
1	NC 209 North; SR 1801 to SR 1646	Modeled	69.3
2	NC 209 North; SR 1646 to SR 1523	Modeled	65.1
3	NC 209 North; SR 1523 to End of Project	Modeled	66.1
BG	"Background" for the entire project area	Modeled	45.0

NOTE: The ambient noise level sites were measured at 15 meters from edge of pavement of the nearest lane of traffic.

# **APPENDIX D**

## **(RELOCATION REPORT)**

# EIS RELOCATION REPORT

North Carolina Department of Transportation  
RELOCATION ASSISTANCE PROGRAM

E.I.S.       CORRIDOR       DESIGN

WBS:	34599.1.1	COUNTY	Haywood	Alternate	1	of	1
I.D. NO.:	R-4047	F.A. PROJECT	STP-209(2)				
DESCRIPTION OF PROJECT:		NC 209 US19-23-74 to SR 1523 widen to multi-lanes and replace rail structure R-32 Haywood Co.					

ESTIMATED DISPLACED					INCOME LEVEL				
Type of Displacees	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Residential	9	0	9	0	0	0	0	0	9
Businesses	3	5	8	0					
Farms									
Non-Profit									

ANSWER ALL QUESTIONS									
Yes	No	Explain all "YES" answers.							
	X	1. Will special relocation services be necessary?							
	X	2. Will schools or churches be affected by displacement?							
X		3. Will business services still be available after project?							
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.							
	X	5. Will relocation cause a housing shortage?							
		6. Source for available housing (list).							
	X	7. Will additional housing programs be needed?							
	X	8. Should Last Resort Housing be considered?							
	X	9. Are there large, disabled, elderly, etc. families?							
	X	10. Will public housing be needed for project?							
X		11. Is public housing available?							
X		12. Is it felt there will be adequate DSS housing available during relocation period?							
	X	13. Will there be a problem of housing within financial means?							
		14. Are suitable business sites available (list source).na							
		15. Number months estimated to complete RELOCATION? <span style="float: right; border: 1px solid black; padding: 2px;">12</span>							

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	\$ 0-150	0	0-20M	0	\$ 0-150	0
20-40M	0	150-250	0	20-40M	0	150-250	0
40-70M	0	250-400	0	40-70M	0	250-400	0
70-100M	0	400-600	0	70-100M	0	400-600	0
100 UP	9	600 UP	0	100 UP	20	600 UP	0
<b>TOTAL</b>	<b>9</b>		<b>0</b>		<b>20</b>		<b>0</b>

**REMARKS (Respond by Number)**

**3. Yes, available business space in the area.**

4. Yes, 1.) Gas station 6 employees, no minorities 2.) Restaurant, 22 employees, 4 minorities, 3.) Restaurant 24 employees, 4 minorities 4.) Insurance Agency 4 employees, no minorities 5.) Bedding Store, 4 employees, no minorities 6.) Restaurant, 15 employees, 2 minorities 7.) Retail 2 employees, no minorities, 8.) Retail 2 employees, no minorities.

6. Multiple Listing Asheville/Haywood Co. area, local real estate listings

11. Public housing is available should it become necessary.

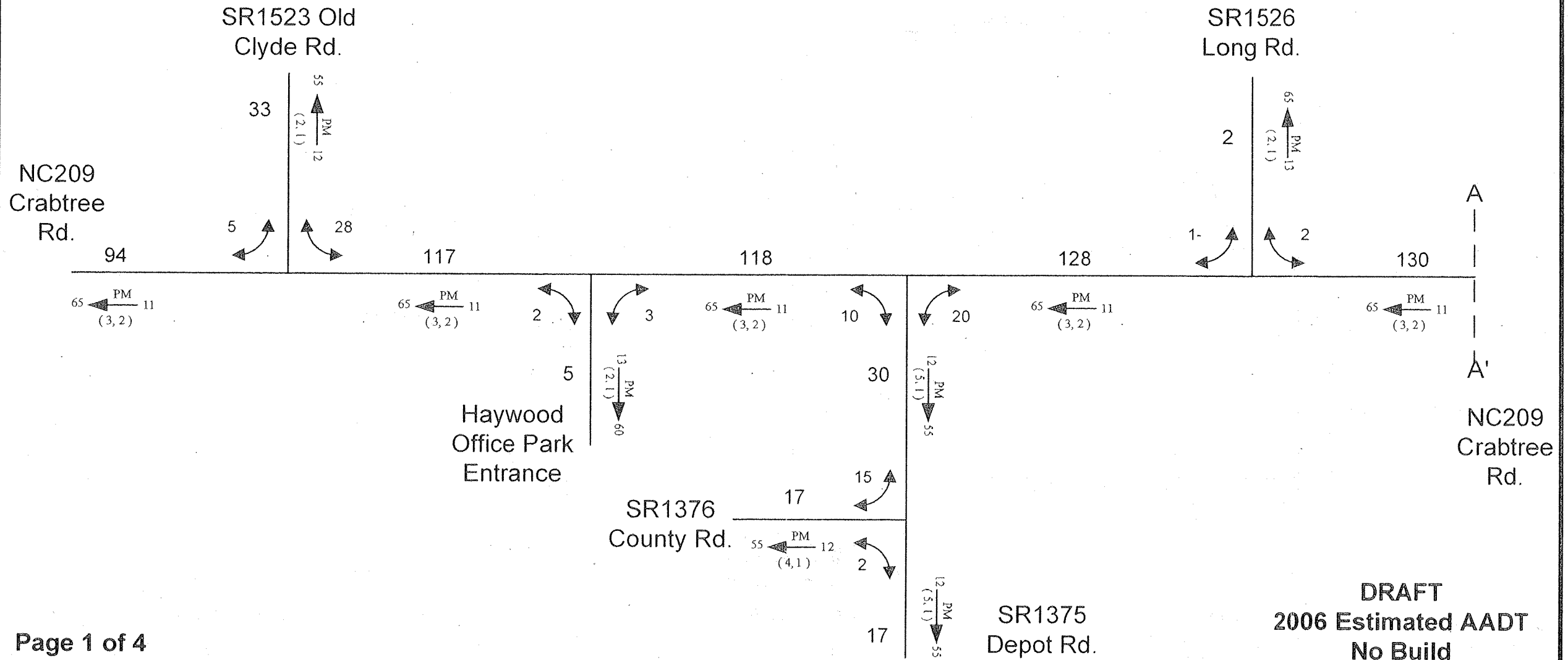
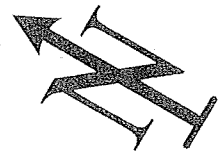
12. DSS housing should be available for the foreseeable future.

<p style="text-align: center;">Right of Way Agent</p>	04-20-2005	<p style="text-align: center;">Relocation Coordinator</p>	11-5-07 Date
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# **APPENDIX E**

## **(TRAFFIC FORECAST)**





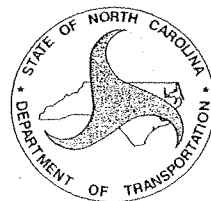
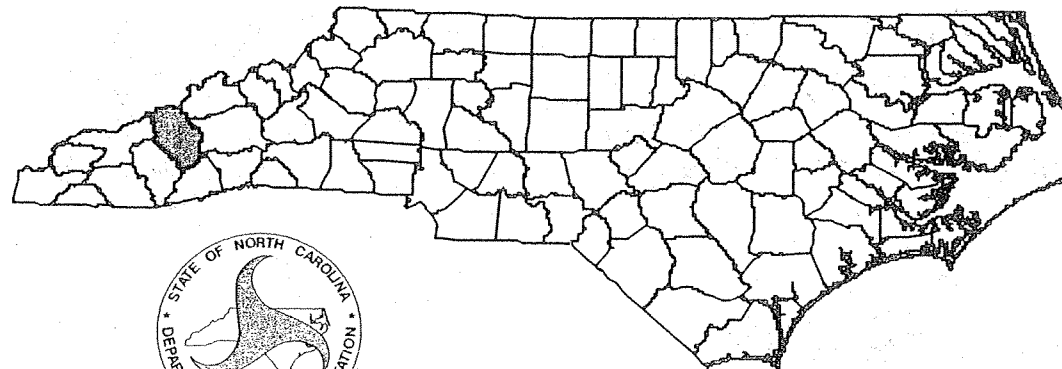
Page 1 of 4

**DRAFT**  
**2006 Estimated AADT**  
**No Build**

**LEGEND**

- ### VPD----# OF 100 VEHICLES PER DAY
  - ### - MUCH LESS THAN ### VPD
  - X MOVEMENT PROHIBITED
- $$\text{DHV} \xrightarrow[\text{(d,t)}]{\text{PM}} \text{D}$$
- DHV DESIGN HOURLY VOLUME (%) = K30
  - K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME
  - PM PM PEAK PERIOD
  - D DIRECTIONAL SPLIT (%)
  - INDICATES DIRECTION OF D
  - ← REVERSE FLOW FOR AM PEAK
  - (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

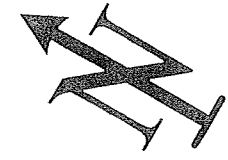
**PROJECT:**

Widen NC209.

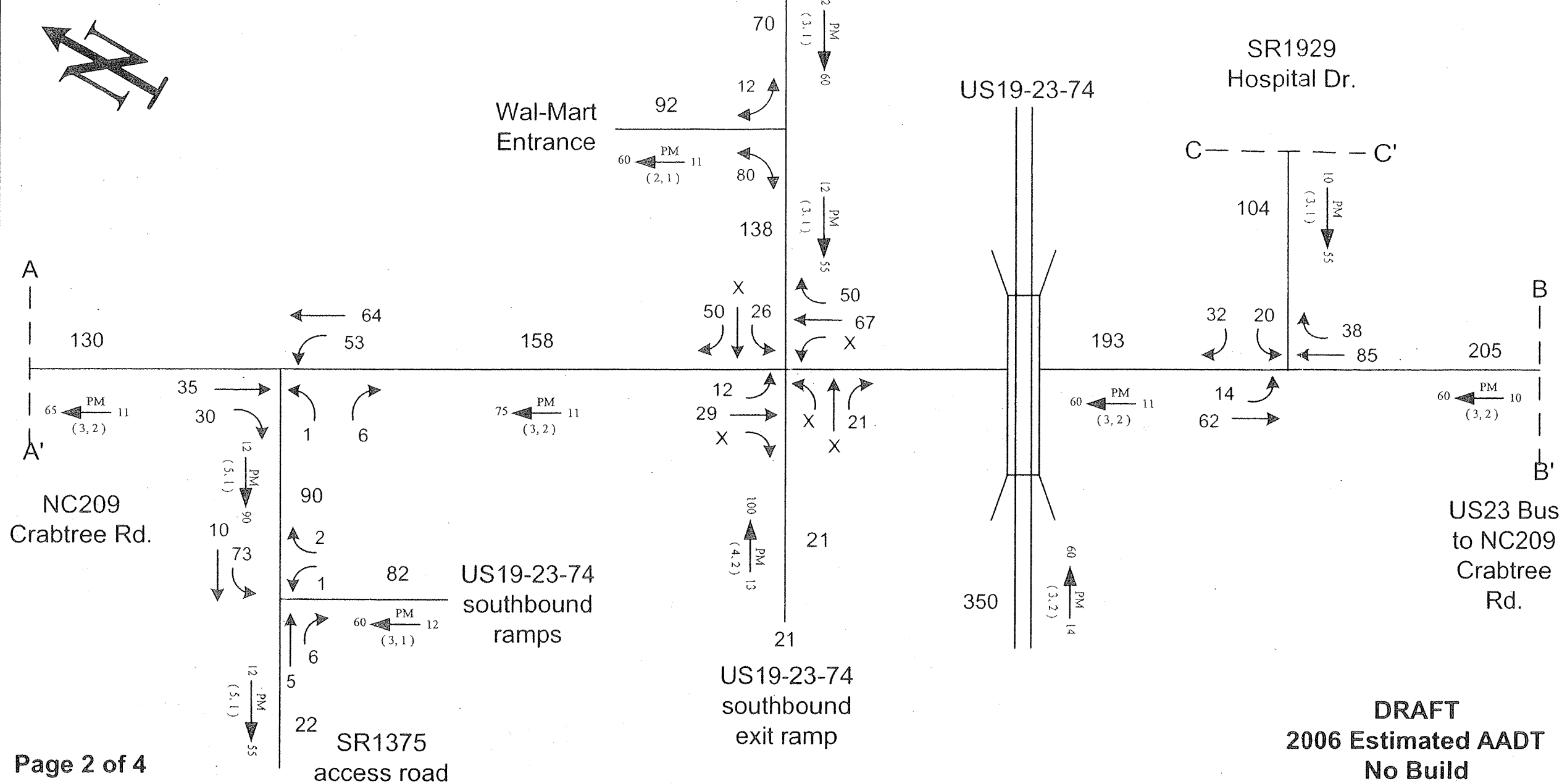
**COUNTY:** Haywood

**DIV.:** 14     **DATE:** Nov. 13, 2006

**TIP #** R-4047     **WBS #**34599.1.1



SR1646 Paragon Pkwy.



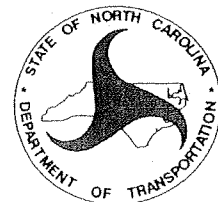
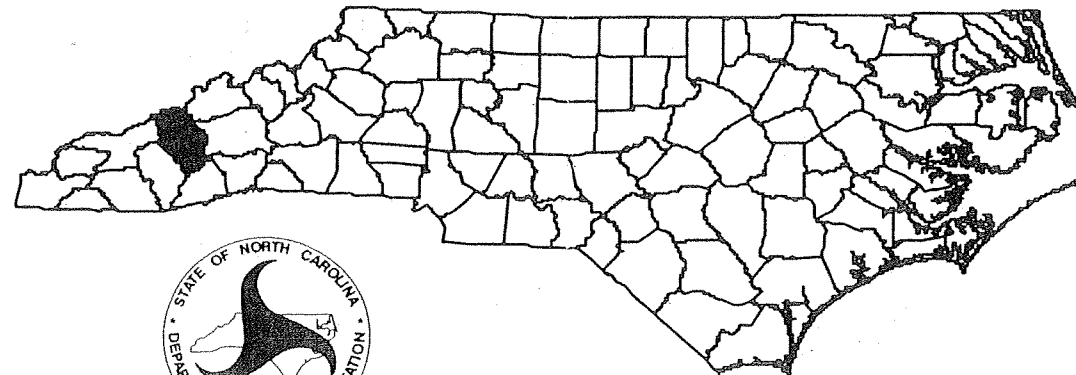
Page 2 of 4

**DRAFT**  
**2006 Estimated AADT**  
**No Build**

**LEGEND**

- ### VPD---# OF 100 VEHICLES PER DAY
- ### - MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
  
- DHV  $\xrightarrow{\text{PM}} \text{D}$   
(d,t)
- DHV DESIGN HOURLY VOLUME (%) =  $K30$   
K30 = 30'TH HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- $\xrightarrow{\text{PM}}$  INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK
- $\xrightarrow{\text{PM}}$  DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

**PROJECT:**

Widen NC209.

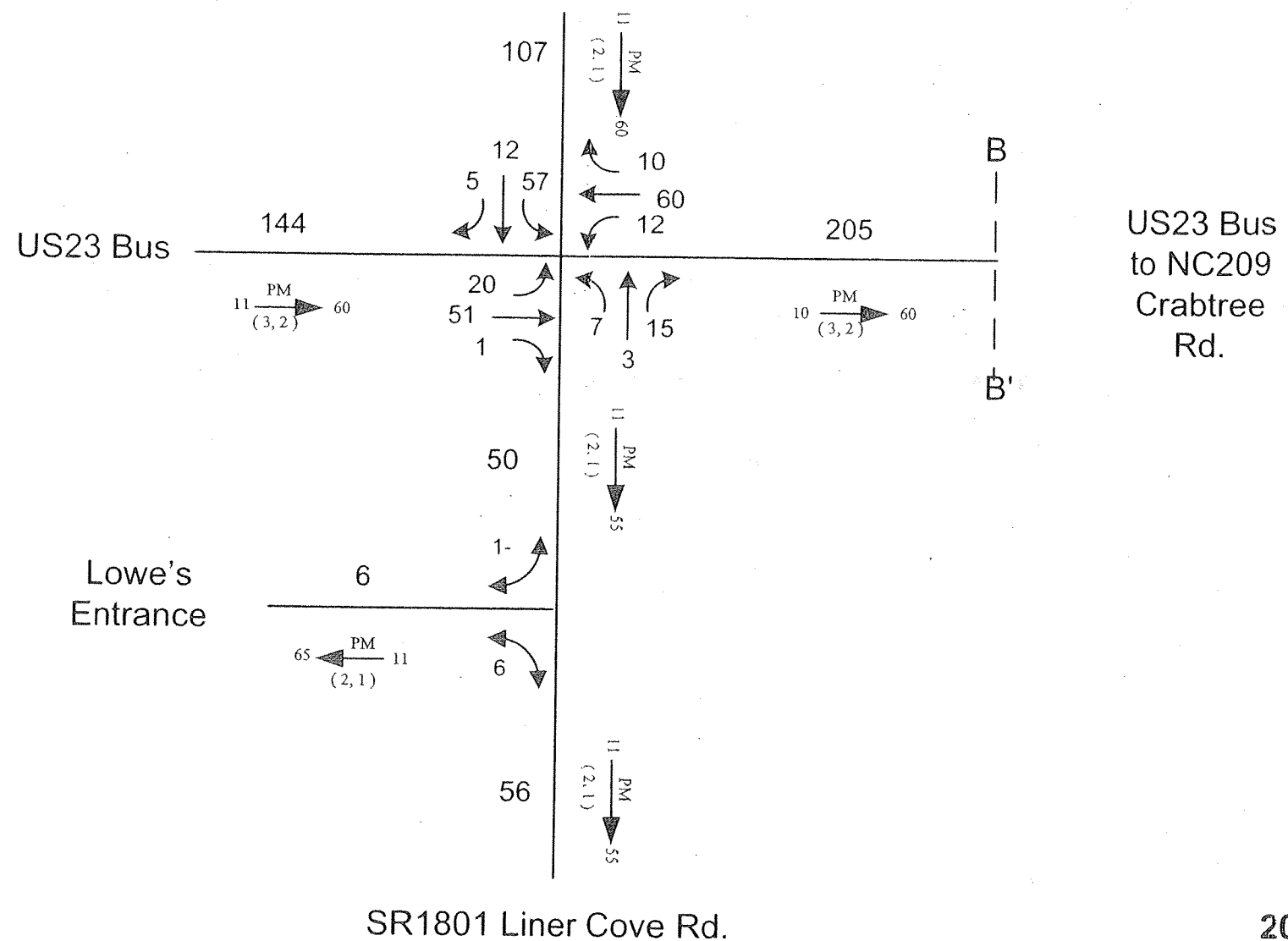
**COUNTY:** Haywood

**DIV. :** 14     **DATE:** Nov. 13, 2006

**TIP #** R-4047     **WBS #**34599.1.1



US19-23-74  
northbound ramps



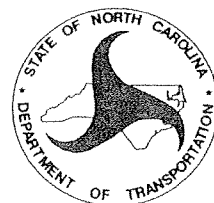
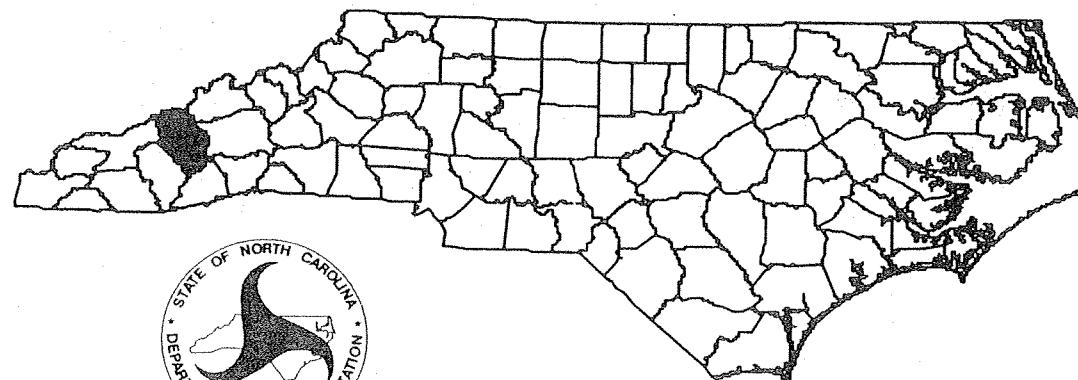
DRAFT  
2006 Estimated AADT  
No Build

LEGEND

### VPD---# OF 100 VEHICLES PER DAY  
### - MUCH LESS THAN ### VPD  
X MOVEMENT PROHIBITED

DHV  $\frac{PM}{(d,t)} \rightarrow D$   
DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30'TH HIGHEST HOURLY VOLUME  
PM PM PEAK PERIOD  
D DIRECTIONAL SPLIT (%)  
 $\rightarrow$  INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK  
(d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



LOCATION:

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

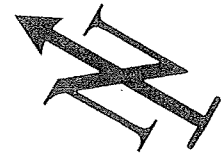
PROJECT:

Widen NC209.

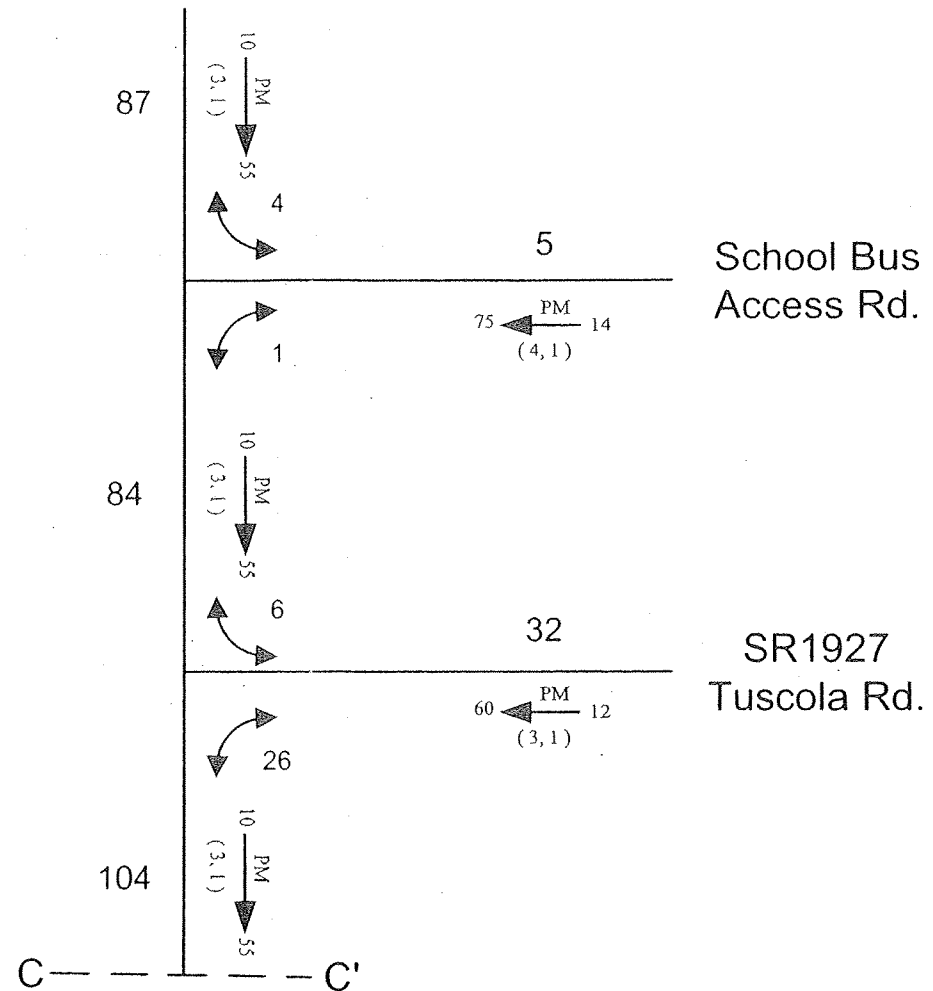
COUNTY: Haywood

DIV.: 14 DATE: Nov. 13, 2006

TIP # R-4047 WBS #34599.1.1



SR1929  
Hospital Dr.

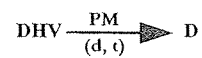


**DRAFT**  
**2006 Estimated AADT**  
**No Build**

Page 4 of 4

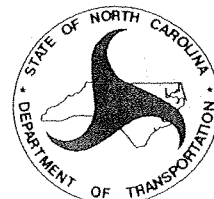
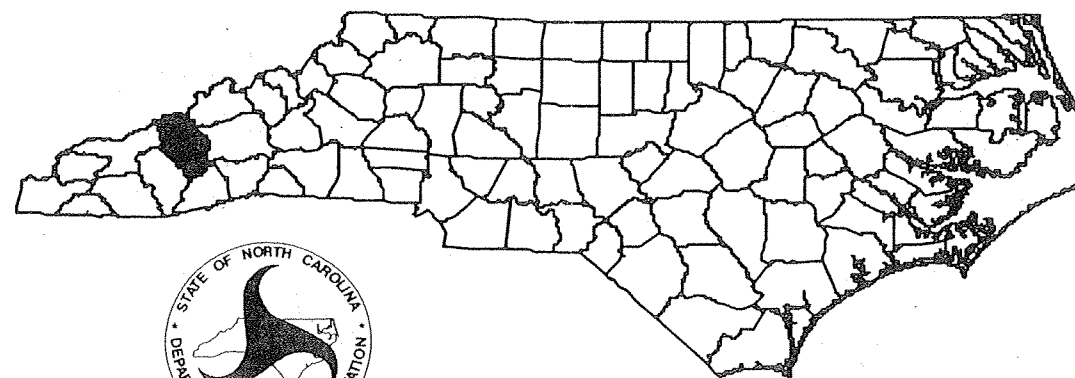
**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
### - MUCH LESS THAN ### VPD  
X MOVEMENT PROHIBITED



DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME  
PM PM PEAK PERIOD  
D DIRECTIONAL SPLIT (%)  
→ INDICATES DIRECTION OF D  
← REVERSE FLOW FOR AM PEAK  
(d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

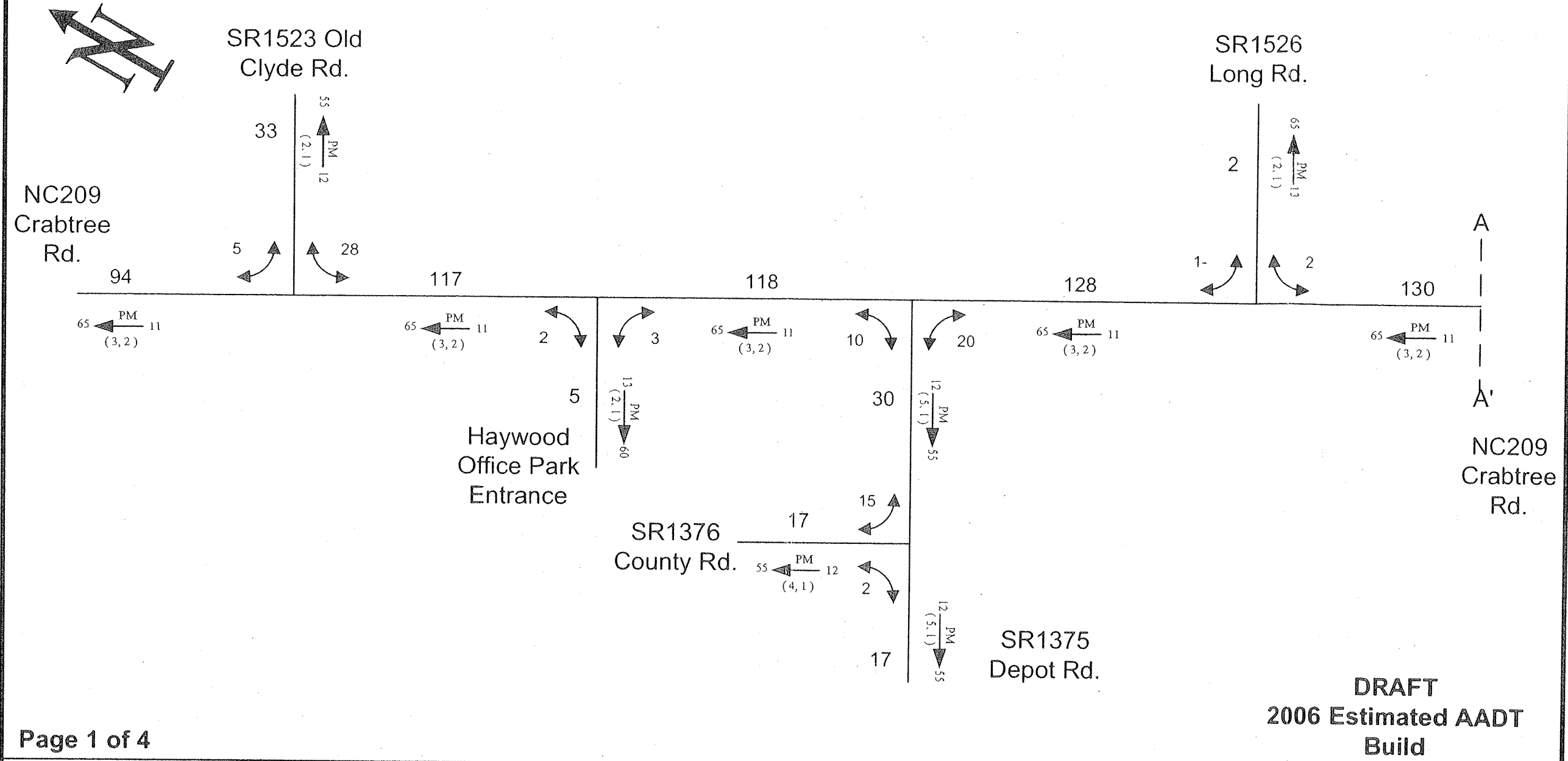
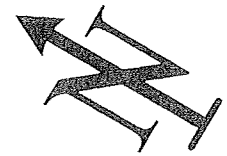
**PROJECT:**

Widen NC209.

**COUNTY:** Haywood

**DIV.:** 14      **DATE:** Nov. 13, 2006

**TIP #** R-4047      **WBS #** 34599.1.1



**DRAFT**  
**2006 Estimated AADT**  
**Build**

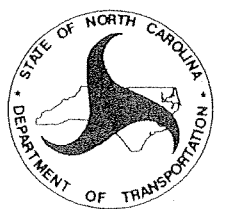
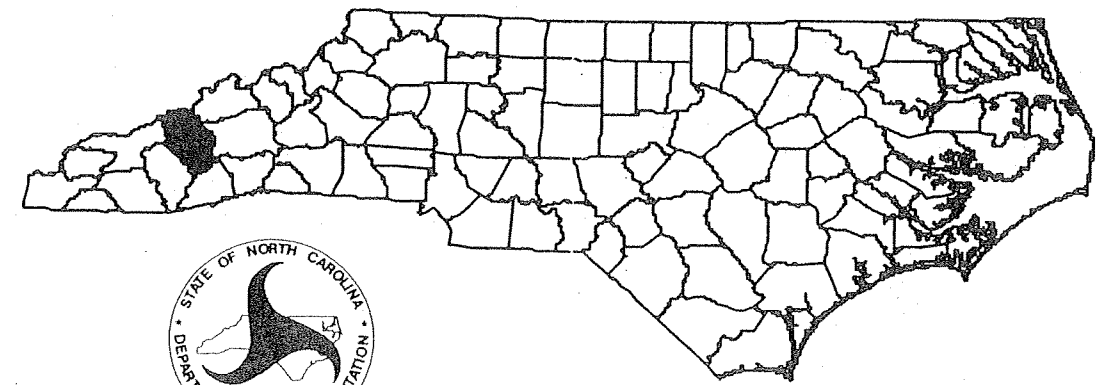
**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
 ### - MUCH LESS THAN ### VPD  
 X MOVEMENT PROHIBITED

$\xrightarrow{\text{PM}}$  D  
 (d,t)

DHV DESIGN HOURLY VOLUME (%) = K30  
 K30 = 30'TH HIGHEST HOURLY VOLUME  
 PM PM PEAK PERIOD  
 D DIRECTIONAL SPLIT (%)  
 $\rightarrow$  INDICATES DIRECTION OF FLOW  
 REVERSE FLOW FOR AM PEAK  
 (d,t) DUALS, TT-ST'S (%)

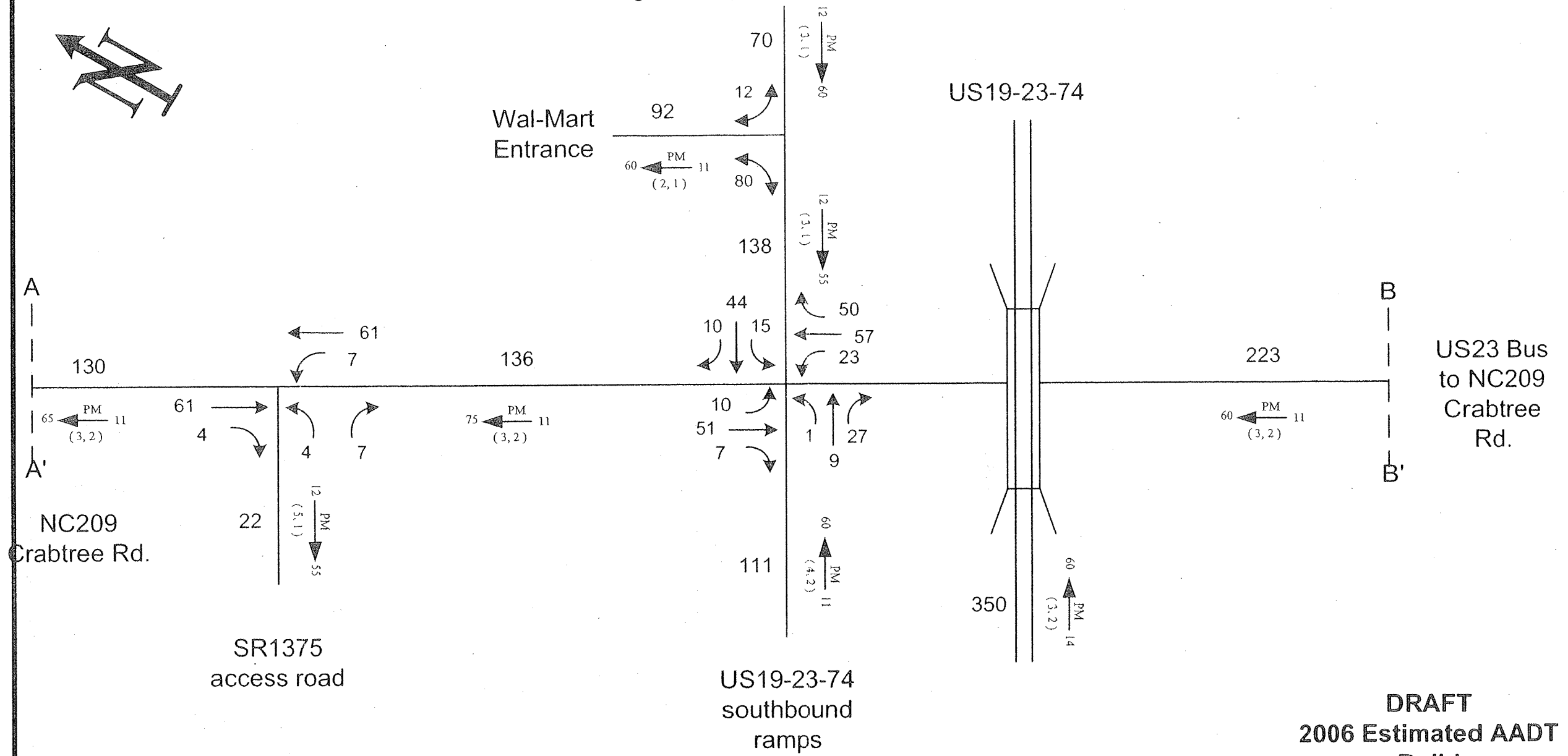
Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**  
 NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

**PROJECT:**  
 Widen NC209.

**COUNTY:** Haywood  
**DIV. :** 14    **DATE:** Nov. 13, 2006  
**TIP #** R-4047    **WBS #**34599.1.1

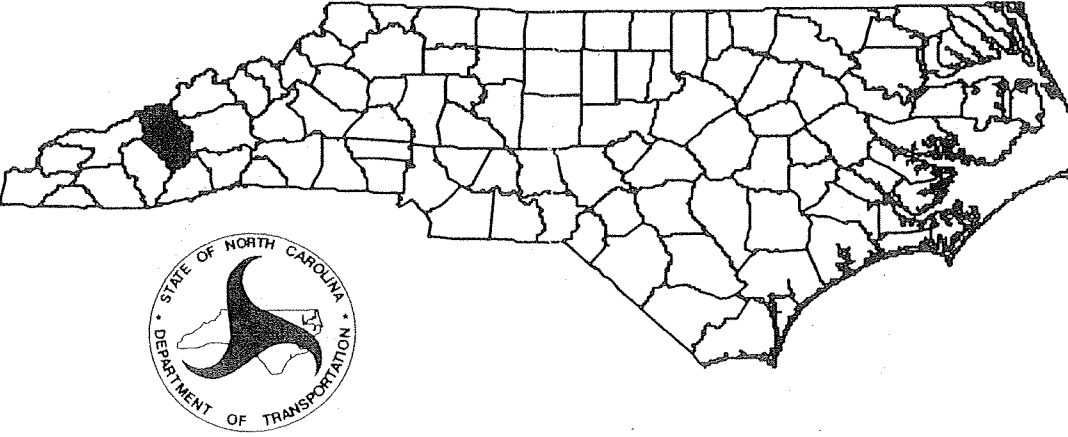


**DRAFT**  
**2006 Estimated AADT**  
**Build**

**LEGEND**

- ### VPD---# OF 100 VEHICLES PER DAY
- ### - MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
  
- DHV  $\xrightarrow[\text{(d,t)}]{\text{PM}}$  D
- DHV DESIGN HOURLY VOLUME (%) =  $K_{30}$
- $K_{30}$  = 30<sup>TH</sup> HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- $\rightarrow$  INDICATES DIRECTION OF D
- $\leftarrow$  REVERSE FLOW FOR AM PEAK
- (d,t) DUALS, TT-ST'S (%)

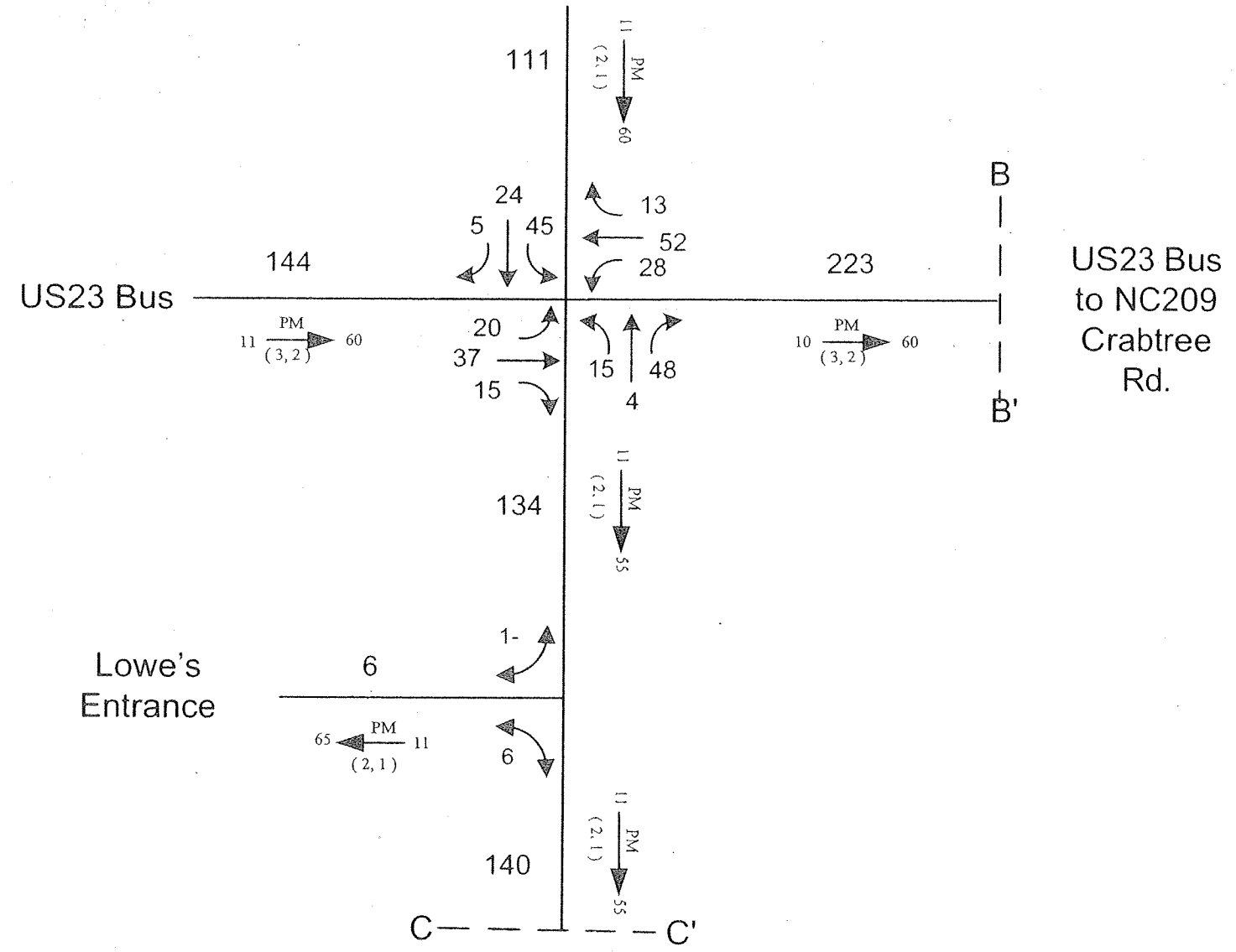
Prepared by Paul S. Schroeder, Ph.D., P.E.



<b>LOCATION:</b>
NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.
<b>PROJECT:</b>
Widen NC209.
<b>COUNTY:</b> Haywood
<b>DIV. :</b> 14 <b>DATE:</b> Nov. 13, 2006
<b>TIP #</b> R-4047 <b>WBS #</b> 34599.1.1



US19-23-74  
northbound ramps



US23 Bus  
to NC209  
Crabtree  
Rd.

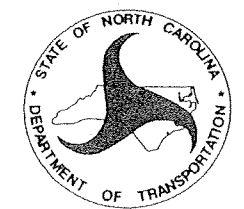
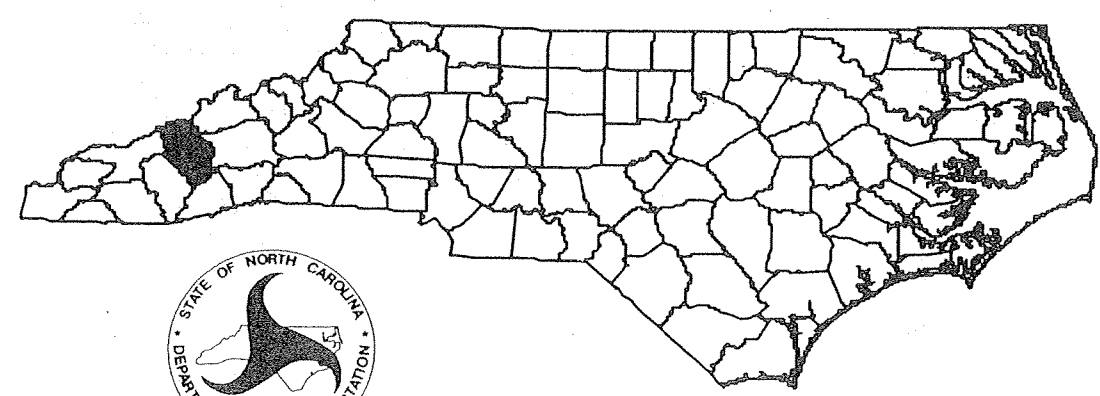
**DRAFT**  
**2006 Estimated AADT**  
**Build**

SR1801 Liner Cove Rd.

**LEGEND**

- ### VPD---# OF 100 VEHICLES PER DAY
- ### - MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
  
- DHV  $\xrightarrow{\text{PM}} \text{D}$   
(d, t)
- DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30'TH HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- $\rightarrow$  INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK
- (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

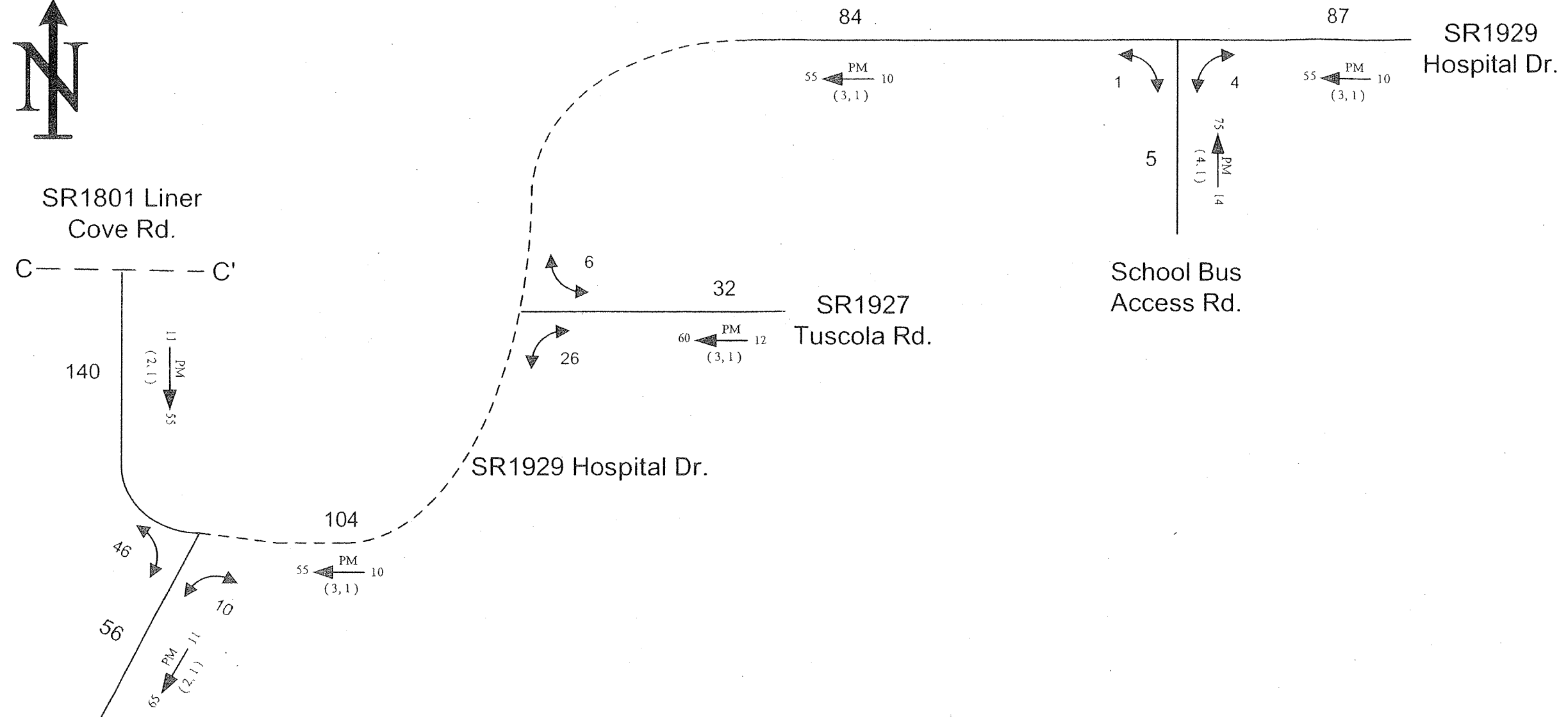
**PROJECT:**

Widen NC209.

**COUNTY:** Haywood

**DIV.:** 14 **DATE:** Nov. 13, 2006

**TIP #** R-4047 **WBS #** 34599.1.1



SR1801 Liner Cove Rd.

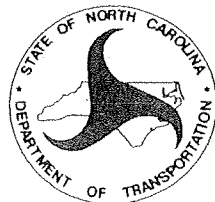
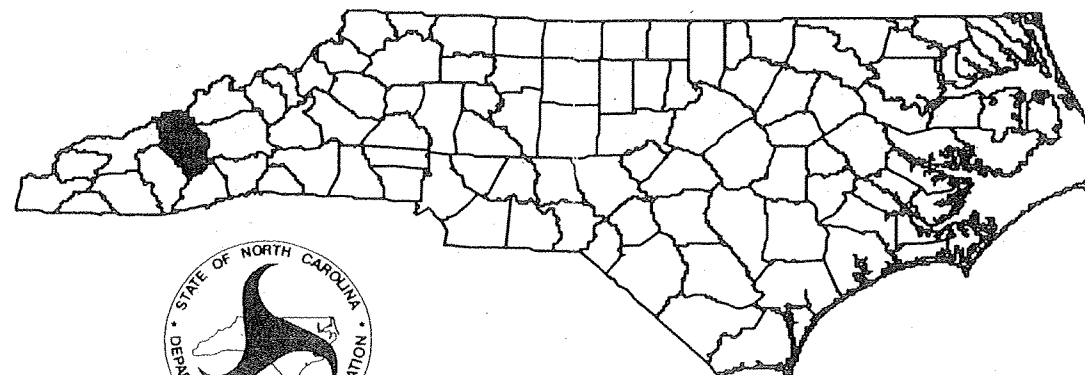
**DRAFT**  
**2006 Estimated AADT**  
**Build**

**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
 ### - MUCH LESS THAN ### VPD  
 X MOVEMENT PROHIBITED

DHV  $\frac{PM}{(d,t)}$   $\rightarrow$  D  
 DHV DESIGN HOURLY VOLUME (%) = K30  
 K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME  
 PM PM PEAK PERIOD  
 D DIRECTIONAL SPLIT (%)  
 $\rightarrow$  INDICATES DIRECTION OF D  
 REVERSE FLOW FOR AM PEAK  
 (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

**PROJECT:**

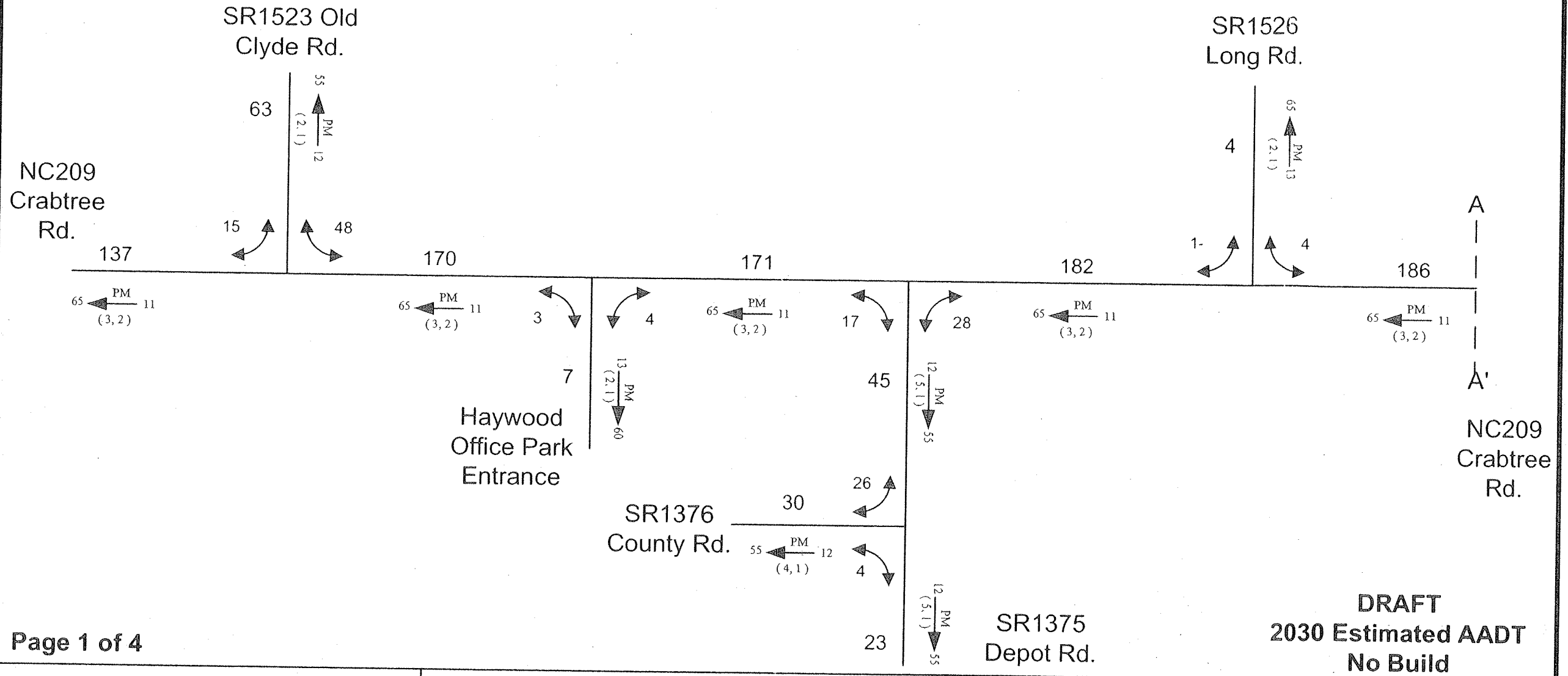
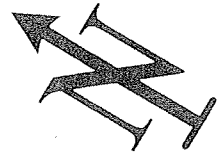
Widen NC209.

**COUNTY:** Haywood

**DIV.:** 14 **DATE:** Nov. 13, 2006

**TIP #** R-4047 **WBS #** 34599.1.1



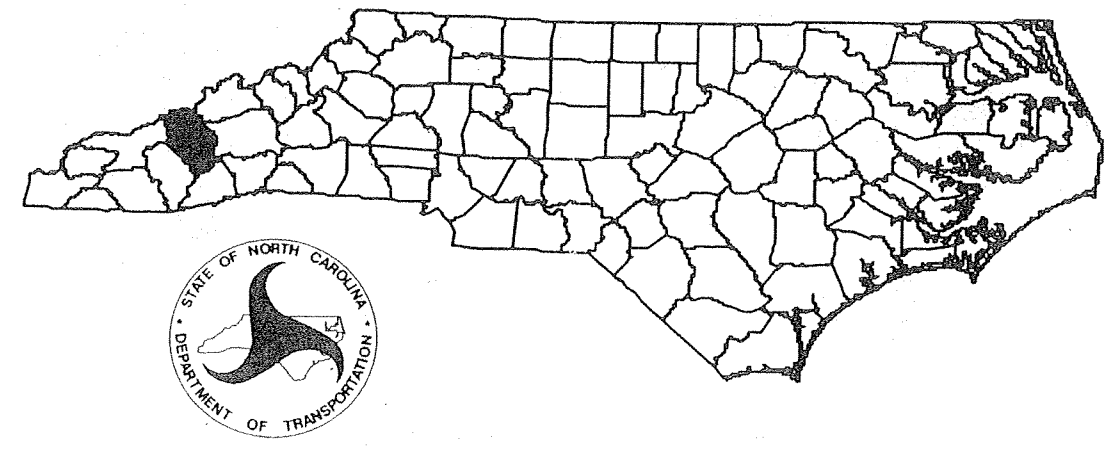


Page 1 of 4

**LEGEND**

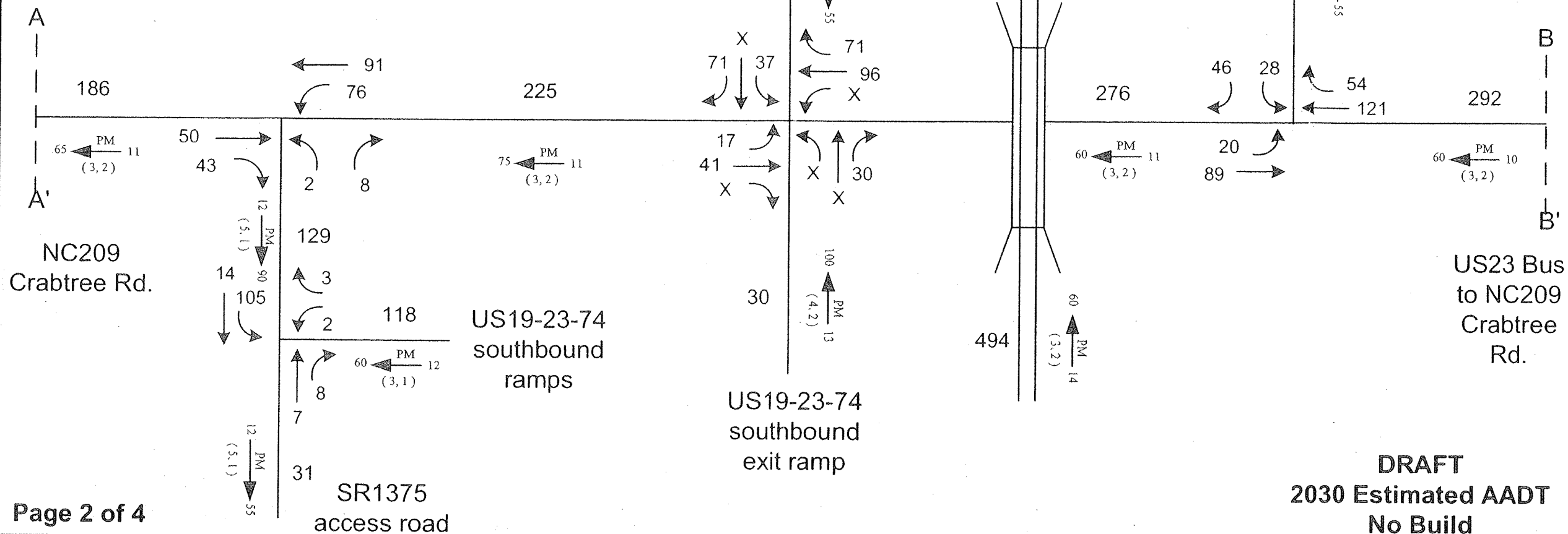
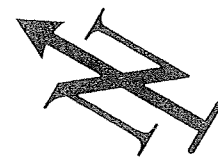
- ### VPD—# OF 100 VEHICLES PER DAY
- ### - MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
  
- DHV  $\xrightarrow{\text{PM}} \text{D}$   
 (d,t)
- DHV DESIGN HOURLY VOLUME (%) = K30  
 K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- $\rightarrow$  INDICATES DIRECTION OF D
- REVERSE FLOW FOR AM PEAK
- (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



<b>LOCATION:</b> NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.
<b>PROJECT:</b> Widen NC209.
<b>COUNTY:</b> Haywood
<b>DIV.:</b> 14 <b>DATE:</b> Nov. 13, 2006
<b>TIP #</b> R-4047 <b>WBS</b> #34599.1.1

SR1646 Paragon Pkwy.



Page 2 of 4

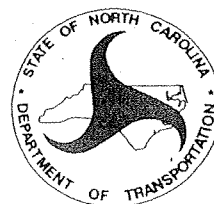
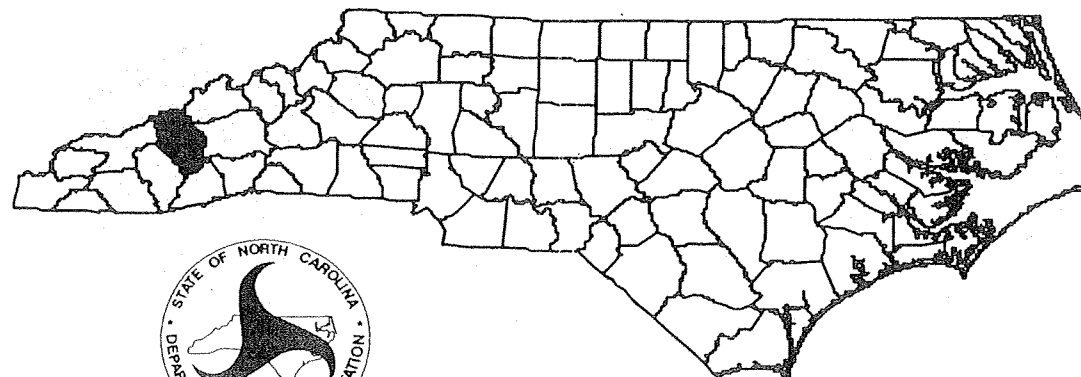
**DRAFT**  
2030 Estimated AADT  
No Build

**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
### - MUCH LESS THAN ### VPD  
X MOVEMENT PROHIBITED

DHV  $\xrightarrow{\text{PM}} \text{D}$   
(d, t)  
DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME  
PM PM PEAK PERIOD  
D DIRECTIONAL SPLIT (%)  
INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK  
(d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

**PROJECT:**

Widen NC209.

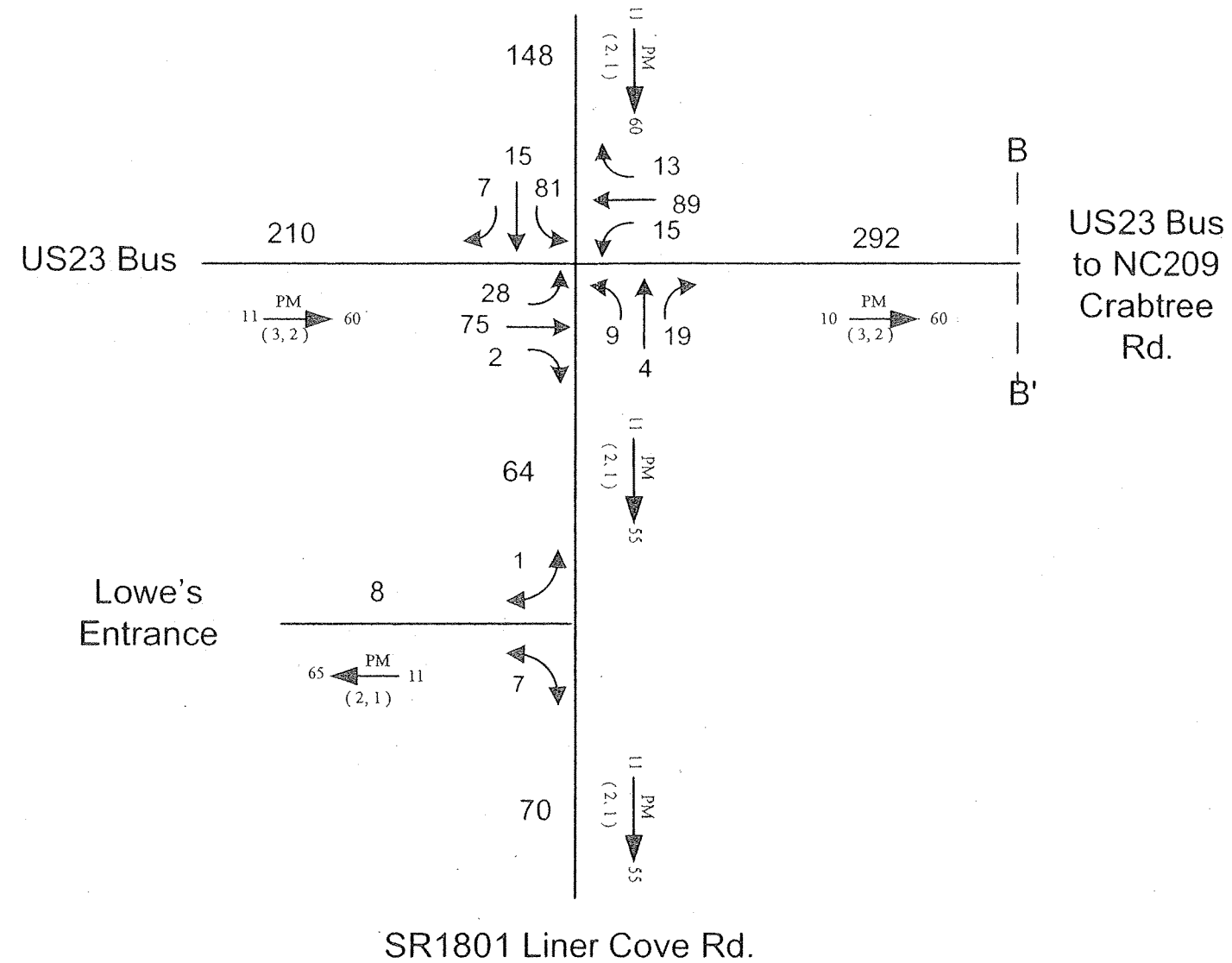
**COUNTY:** Haywood

**DIV. :** 14 **DATE:** Nov. 13, 2006

**TIP #** R-4047 **WBS #**34599.1.1



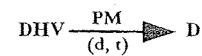
US19-23-74  
northbound ramps



DRAFT  
2030 Estimated AADT  
No Build

LEGEND

### VPD---# OF 100 VEHICLES PER DAY  
### - MUCH LESS THAN ### VPD  
X MOVEMENT PROHIBITED

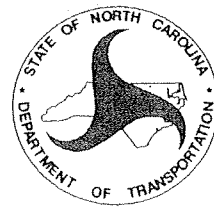
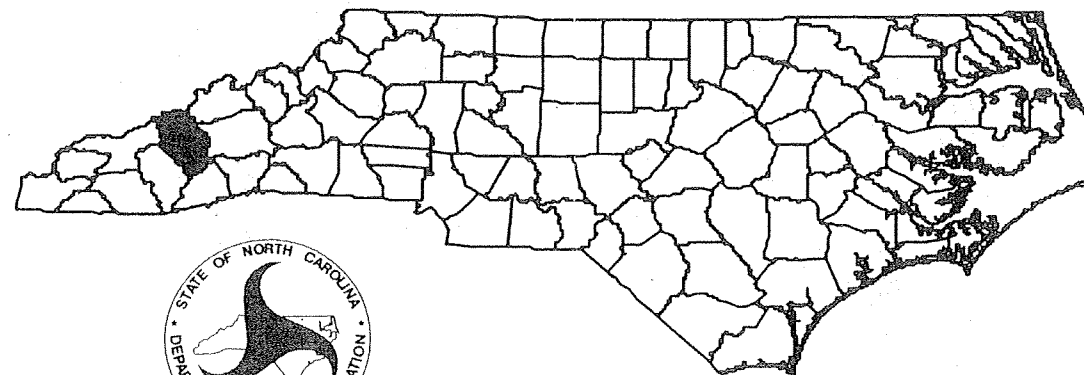


DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30'TH HIGHEST HOURLY VOLUME

PM PM PEAK PERIOD  
D DIRECTIONAL SPLIT (%)

→ INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK  
(d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



LOCATION:

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

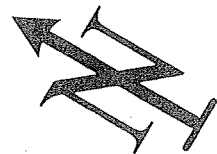
PROJECT:

Widen NC209.

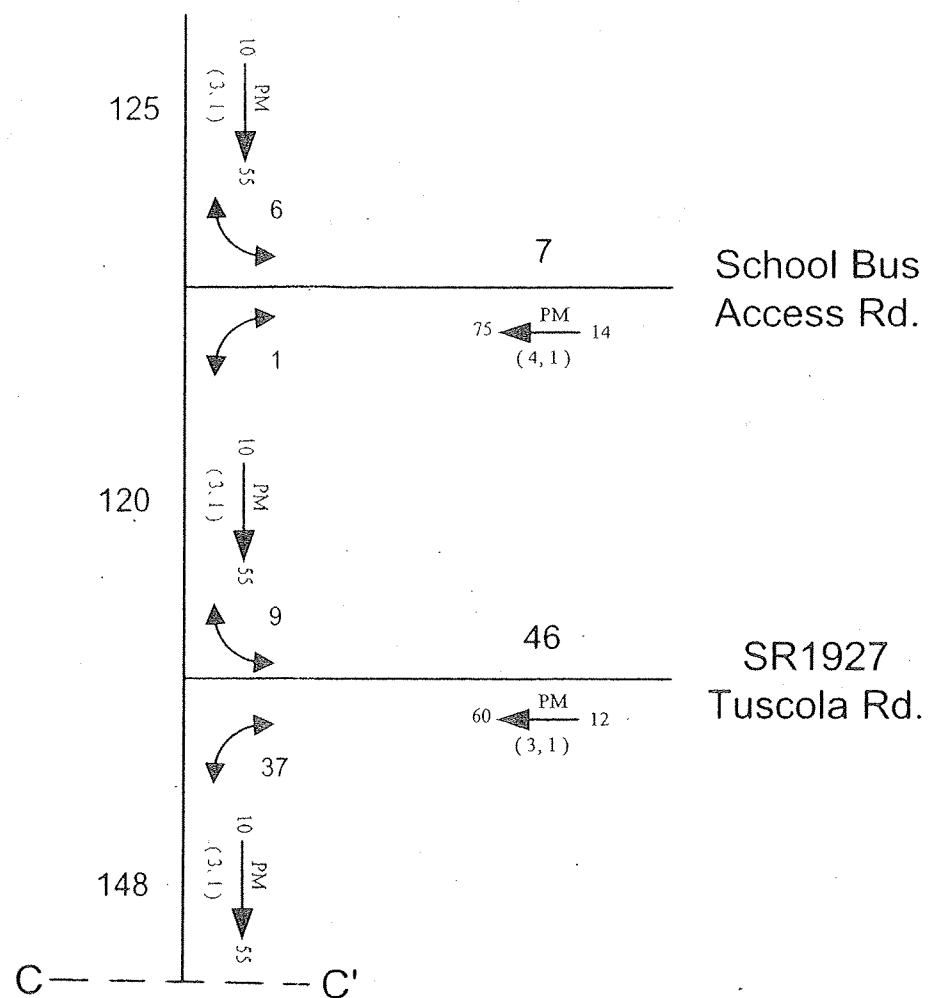
COUNTY: Haywood

DIV.: 14 DATE: Nov. 13, 2006

TIP # R-4047 WBS #34599.1.1



SR1929  
Hospital Dr.



**DRAFT**  
**2030 Estimated AADT**  
**No Build**

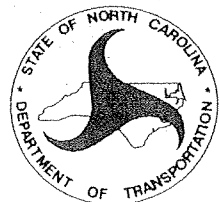
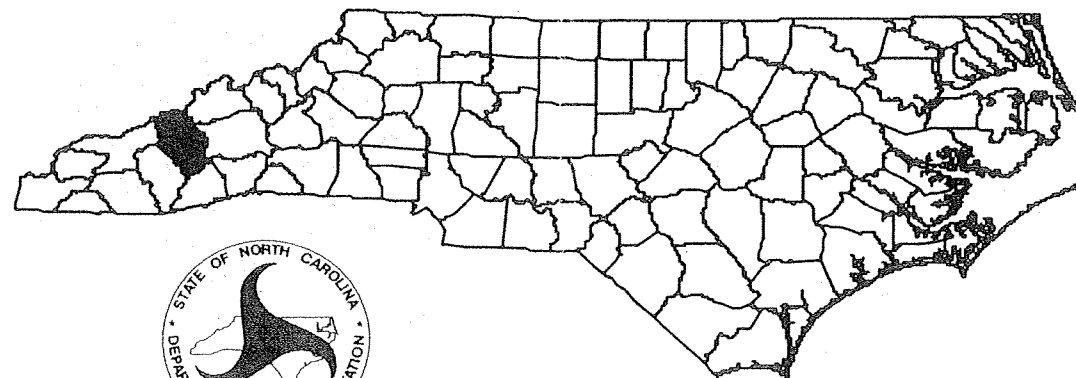
Page 4 of 4

**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
### - MUCH LESS THAN ### VPD  
X MOVEMENT PROHIBITED

DHV  $\xrightarrow[\text{(d,t)}]{\text{PM}}$  D  
DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME  
PM PM PEAK PERIOD  
D DIRECTIONAL SPLIT (%)  
INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK  
(d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

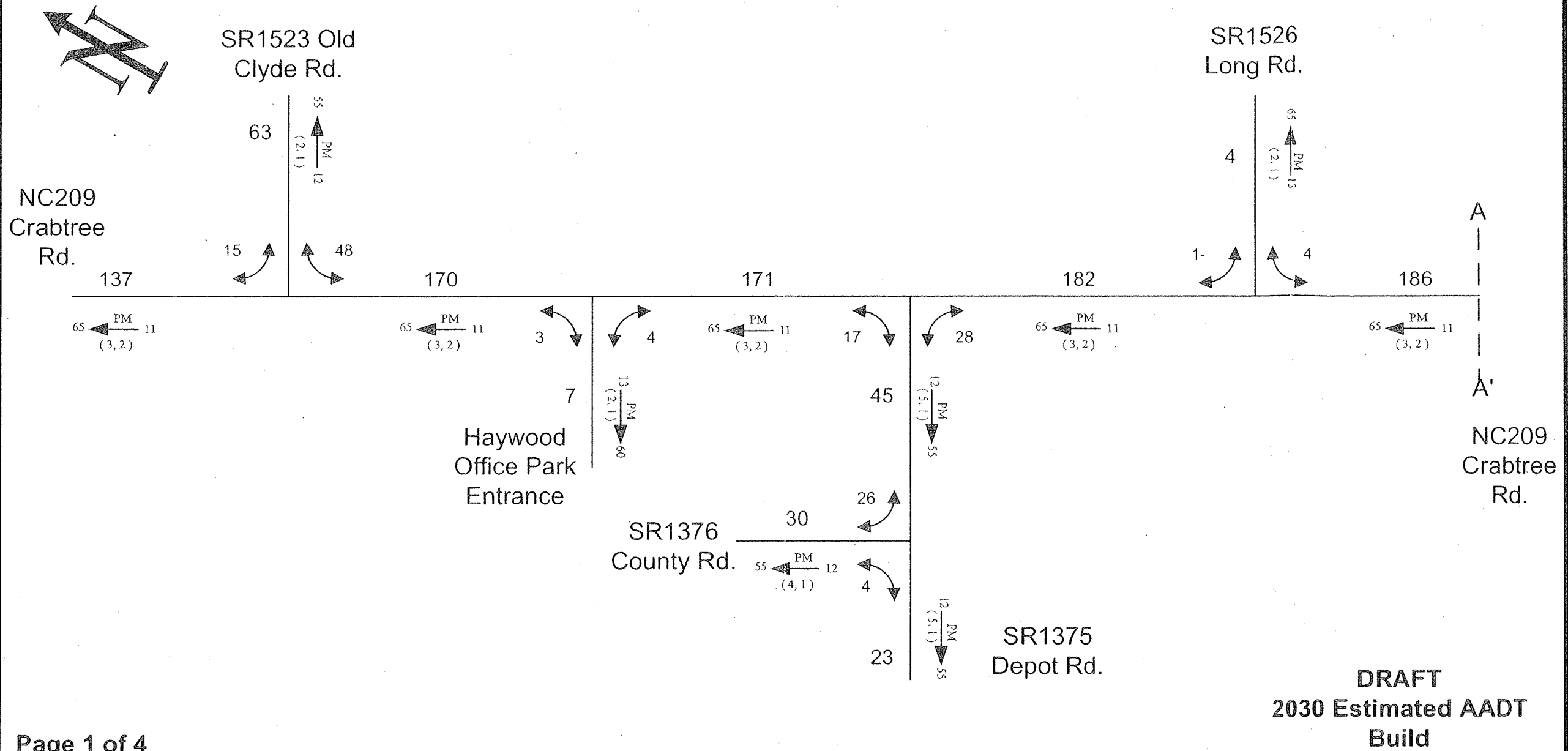
**PROJECT:**

Widen NC209.

**COUNTY:** Haywood

**DIV.:** 14 **DATE:** Nov. 13, 2006

**TIP #** R-4047 **WBS #**34599.1.1



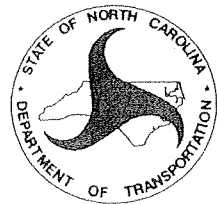
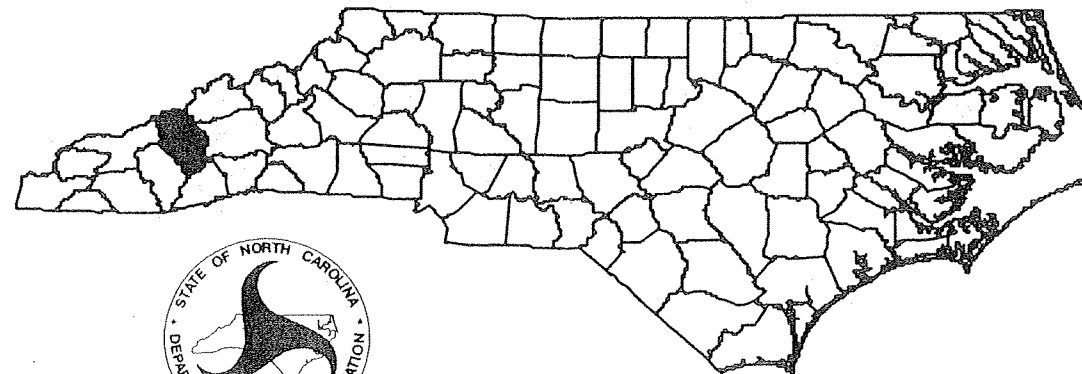
Page 1 of 4

**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
 ### - MUCH LESS THAN ### VPD  
 X MOVEMENT PROHIBITED

DHV  $\xrightarrow[\text{(d,t)}]{\text{PM}}$  D  
 DHV DESIGN HOURLY VOLUME (%) = K30  
 K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME  
 PM PM PEAK PERIOD  
 D DIRECTIONAL SPLIT (%)  
 $\xrightarrow{\hspace{1cm}}$  INDICATES DIRECTION OF D  
 REVERSE FLOW FOR AM PEAK  
 (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

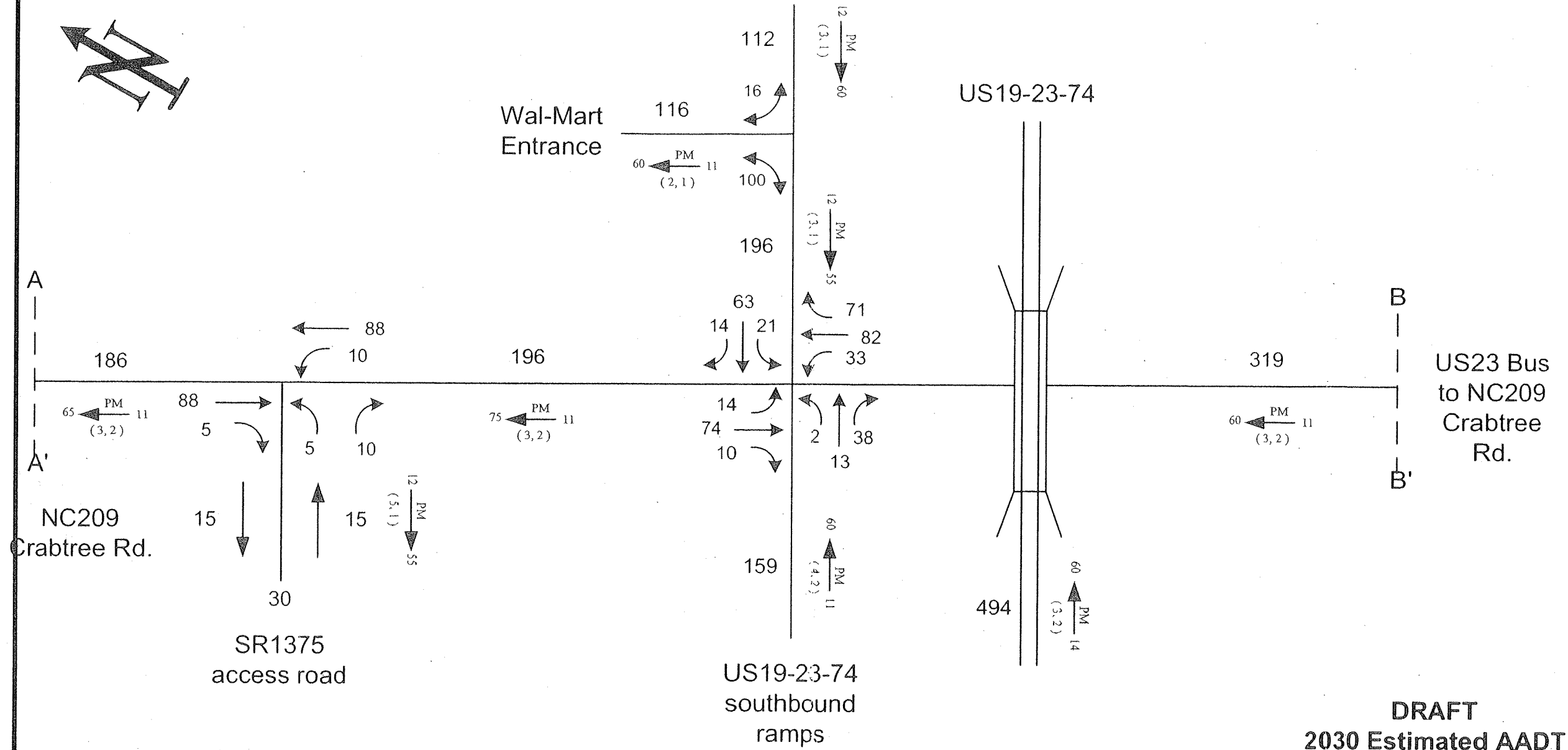
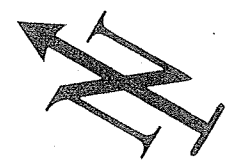
**PROJECT:**

Widen NC209.

**COUNTY:** Haywood

**DIV. :** 14     **DATE:** Nov. 13, 2006

**TIP #** R-4047     **WBS #**34599.1.1

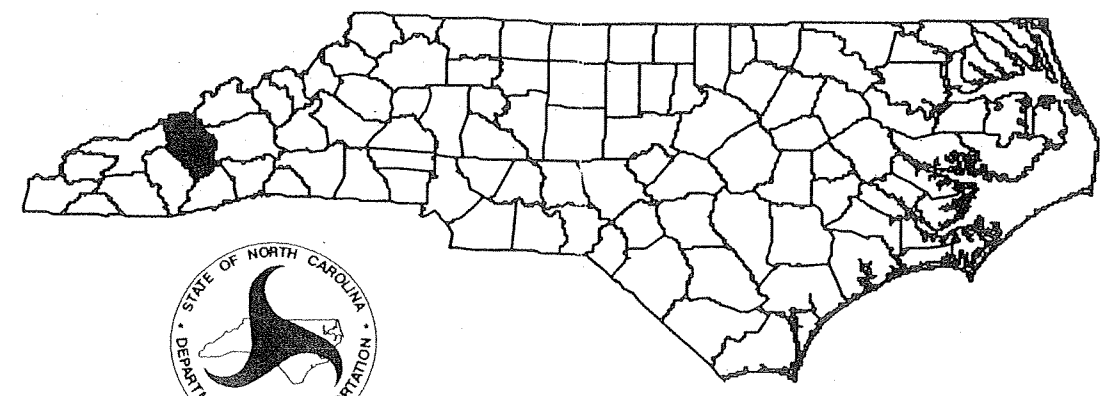


**DRAFT**  
**2030 Estimated AADT**  
**Build**

**LEGEND**

- ### VPD—# OF 100 VEHICLES PER DAY
- ### - MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
  
- DHV  $\xrightarrow{\text{PM}} \text{D}$   
(d,t)
- DHV DESIGN HOURLY VOLUME (%) =  $K_{30}$   
 $K_{30}$  = 30<sup>TH</sup> HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- $\xrightarrow{\text{PM}}$  INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK
- (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**  
 NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

**PROJECT:**  
 Widen NC209.

**COUNTY:** Haywood

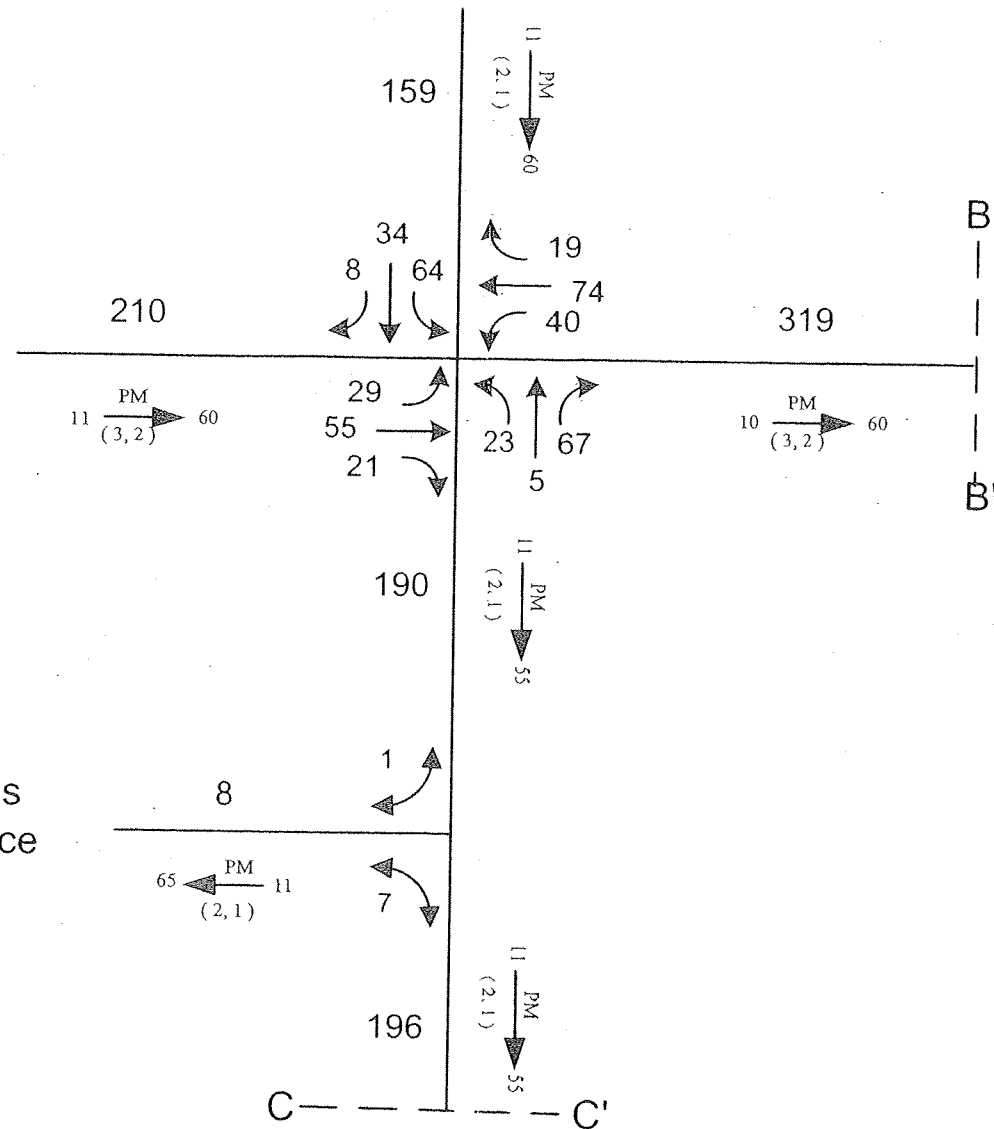
**DIV. :** 14      **DATE:** Nov. 13, 2006

**TIP #** R-4047      **WBS** #34599.1.1



US19-23-74  
northbound ramps

US23 Bus



US23 Bus  
to NC209  
Crabtree  
Rd.

Lowe's  
Entrance

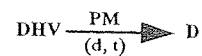
**DRAFT**  
**2030 Estimated AADT**  
**Build**

Page 3 of 4

SR1801 Liner Cove Rd.

**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
### - MUCH LESS THAN ### VPD  
X MOVEMENT PROHIBITED

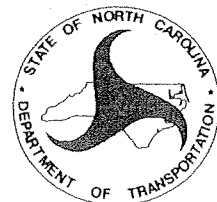
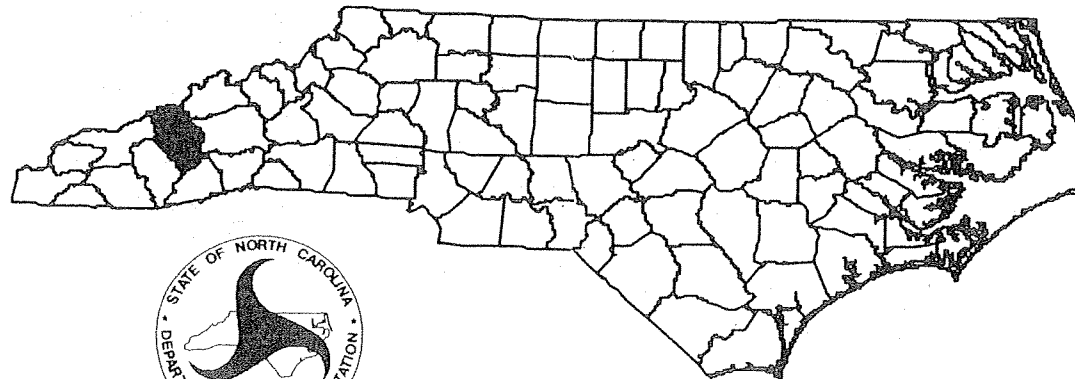


DHV DESIGN HOURLY VOLUME (%) = K30  
K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME

PM PM PEAK PERIOD  
D DIRECTIONAL SPLIT (%)

→ INDICATES DIRECTION OF D  
REVERSE FLOW FOR AM PEAK  
(d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old  
Clyde Road to US19-23-74 interchange.

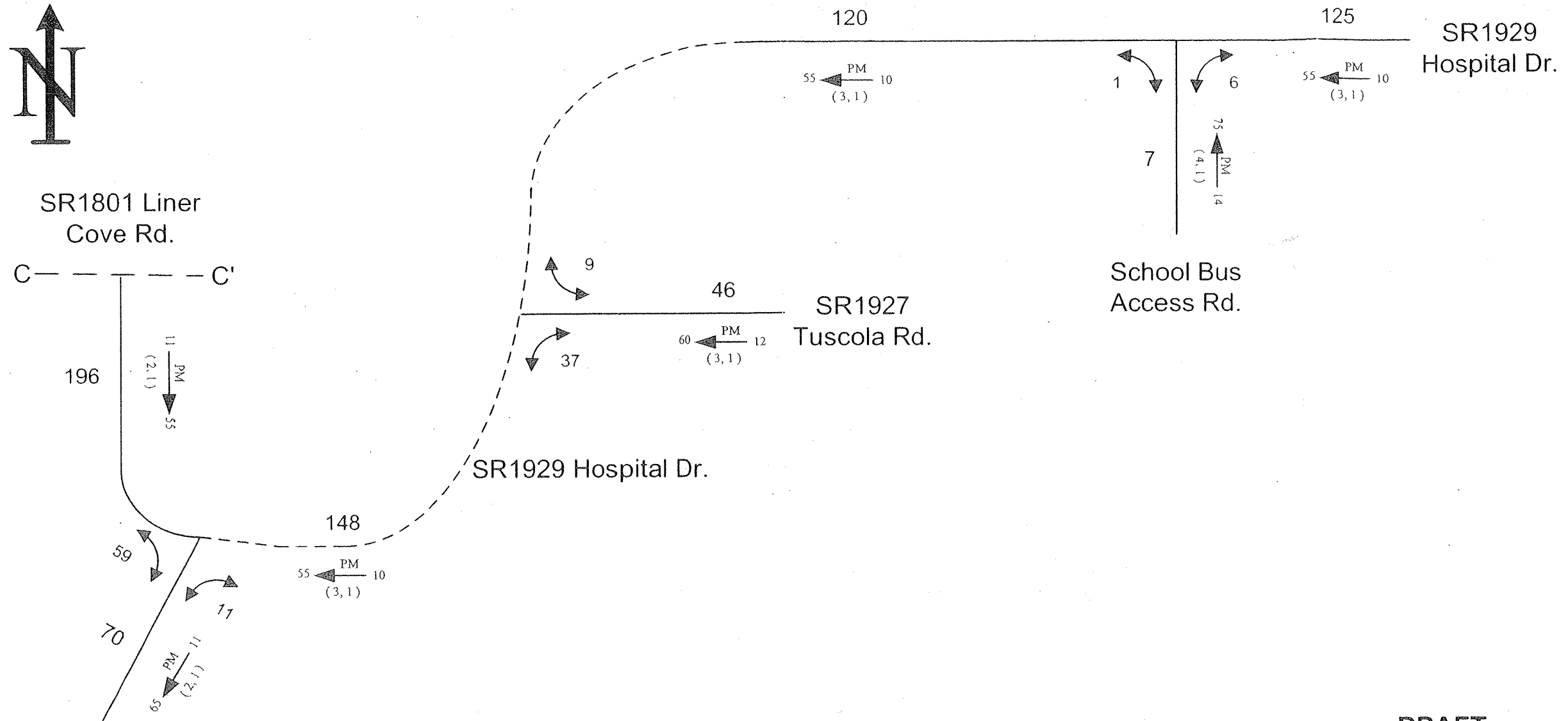
**PROJECT:**

Widen NC209.

**COUNTY:** Haywood

**DIV.:** 14 **DATE:** Nov. 13, 2006

**TIP #** R-4047 **WBS** #34599.1.1



SR1801 Liner Cove Rd.

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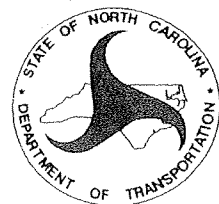
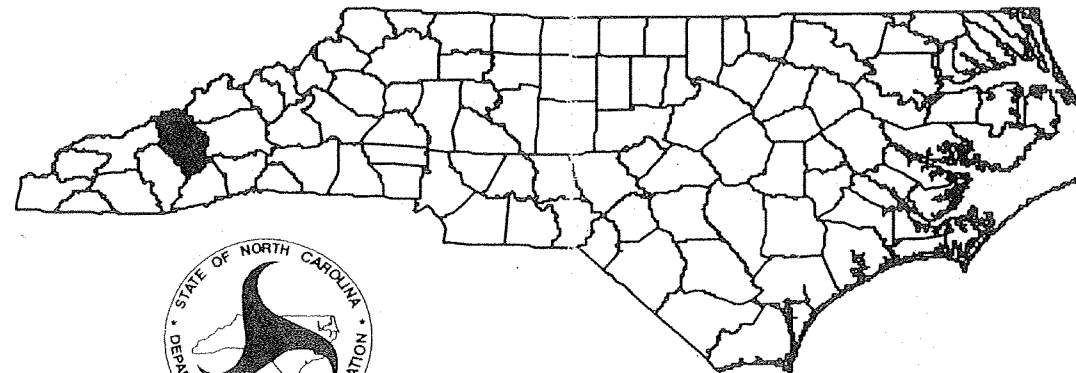
**DRAFT**  
2030 Estimated AADT  
Build

**LEGEND**

### VPD---# OF 100 VEHICLES PER DAY  
 ### - MUCH LESS THAN ### VPD  
 X MOVEMENT PROHIBITED

DHV  $\xrightarrow{\text{PM}} \text{D}$   
 (d,t)  
 DHV DESIGN HOURLY VOLUME (%) = K30  
 K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME  
 PM PM PEAK PERIOD  
 D DIRECTIONAL SPLIT (%)  
 $\xrightarrow{\text{PM}}$  INDICATES DIRECTION OF D  
 REVERSE FLOW FOR AM PEAK  
 (d,t) DUALS, TT-ST'S (%)

Prepared by Paul S. Schroeder, Ph.D., P.E.



**LOCATION:**

NC209 Crabtree Road from SR1523 Old Clyde Road to US19-23-74 interchange.

**PROJECT:**

Widen NC209.

**COUNTY:** Haywood

**DIV.:** 14 **DATE:** Nov. 13, 2006

**TIP #** R-4047 **WBS #** 34599.1.1



**APPENDIX F  
(NCDOT CAPACITY  
ANALYSIS GUIDELINES)**

# NCDOT Congestion Management CAPACITY ANALYSIS GUIDELINES

## TIP Project Traffic Analyses

The values and information below serve as standard practices and default input values for traffic analysis reports as they relate to TIP Projects. Changes or deviations from these standards are allowed, but should be discussed, justified and documented. Failure to properly justify and document changes and deviations may result in the analysis being returned for changes, corrections and justification without a detailed review and the additional analysis will be performed at the consultant's expense. A meeting regarding a scope of study is encouraged where significant deviations from standard practice are anticipated. They are also encouraged before scope is agreed to when contracting with other Branches of the Department.

By reviewing reports, plans, and submittals, the North Carolina Department of Transportation (NCDOT) in no way relieves the Team / PEF of possible claims or additional work resulting from errors or omissions. The reviews and comments by NCDOT are cursory in nature and do not involve in-depth analysis and design review.

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### General

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When submitting a traffic analysis for a TIP Project, all available documentation that would prove beneficial in review of said analyses should be included in the submittal. This includes but is not limited to, available plans, traffic forecast used in the analysis, appropriate software printouts, any assumptions used in the analysis, etc. Information regarding existing conditions should be provided where applicable.

All submittals must be in latest version of the software that NCDOT is utilizing.

When performing analyses for Build Conditions providing an adequate overall level of service alone is not sufficient. Items such as volume to capacity ratio, queuing, and intersection movement level of service should be evaluated and addressed.

Documentation should be provided to justify any change in default values.

When new developments or schools are located along a TIP Project, coordination with the Access Management Group and Municipal and School Transportation Assistance Group is required, accordingly.

For median divided facilities, the Department's Median Crossover Guidelines should be used. Any median openings not adhering to these guidelines will require a design exception. These guidelines are provided on our webpage.

Before beginning a review, the corridor should be checked to see if it is a Strategic Highway Corridor. If so, the vision for the corridor should be maintained. Interim

measures, such as signalized intersections on expressways for identified interchange locations, may be required due to scoping limitations for a specific project.

Where feasible alternate intersection treatments should be evaluated, including various treatments of median U-turns as described in the memorandum from the State Highway Administrator dated January 6, 2006 on the Implementation of Directional Crossover with Median U-turns.

## **Signalized Intersections**

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### Coordinated Signal Systems

- When analyzing multiple signalized intersections, the default should be to analyze as a coordinated signal system. If the analysis procedure indicates that coordination is not recommended that information should be included in submittals.
- For coordinated signals, under recall, the usual condition will specify none for minor streets or movements, and the coordinated phase should be the main street through movement, typically phases 2+6.
- Cycle lengths for individual intersections in coordinated systems should be equal; double or half cycles can be used with justification if the minimum cycle lengths are accommodated.
- For existing conditions, the existing system cycle length should be used where known.

### General Information

- For analysis of future improvements, when protected left-turns are used, use protected only phasing not protected / permitted phasing. This analysis will identify the maximum queuing storage necessary in the event that protected-only phasing is necessary. In the design of the traffic signal, the use of protected/permitted phasing may be allowed.
- When analyzing existing signalized intersections, only use a leading phase sequence for protective/permitted phasing left turn movements, to prevent the yellow trap. Lagging operation is allowed for protective left turn movements only.
- Check for the possibility of using overlapping right-turn phasing where appropriate.
- For analysis of future operations, Right-Turn-On-Red (RTOR) operation should not be included. In the design of the traffic signal RTOR may be allowed. Exceptions will require justification and approval. To provide for a proper comparison, do not use RTOR for existing conditions.
- If an intersection is not anticipated to be signalized as part of the T.I. P. Project but may warrant signalization by the design year, both signalized and unsignalized analyses should be performed to ensure adequate laneage and storage is provided for both signalized and unsignalized operations in the future. The recommended storage lane lengths should reflect the maximum queue from both analyses. Signal recommendations should be obtained from the Regional Traffic Engineer (RTE).
- Due to uncertainty in determining between Rural and Urban conditions and predicting future land use, a PHF of 0.90 should be used, which is a median value between the 0.88 for Rural and the 0.92 for Urban conditions listed in the 2000

HCM. If field traffic counts have been acquired, the resulting PHFs should be used for existing conditions.

- Use the AADT, K (DHV), % Trucks, and D (directional split) provided by the Transportation Branch’s forecast. Percent trucks used in the analysis should be the total of TTST and Duals divided by two.
- Where appropriate pedestrians should be considered and accommodated. This can include but is not limited to pedestrian phases, adequate pedestrian clearance, and potential conflicts with phasing, such as overlapping phases.

Signal Timing and Phasing

- Total Lost Time – 5.0 sec/phase for most intersections, and increase clearance as needed for large cross sections such as a single point urban interchanges (SPUI).
- For existing traffic use yellow = 5 sec., red = 2 sec or existing timings. For analysis purposes, rounding up to the nearest second is preferred.
- For future No-Build and Build traffic use yellow = 5 sec., red = 2 sec. Clearance times using NCDOT criteria may also be used. If design plans are available, the clearance calculation spreadsheets provided by the Signals and Geometrics Section is acceptable. The calculation for these clearance times shall be included and the spreadsheets may be found on our website.
- The minimum initial green time for all protected left turn movements and all side street movements is 7 seconds.
- The minimum initial green time for the main street through movements is dependent on the speed limit and policy provided in the NCDOT Signals and Geometrics Design Manual. For 35 mph or less, use 10 seconds; for 36-45 mph use 12 seconds, for 46 mph or higher use 14 seconds.
- All cycle lengths should be rounded to the nearest 5 seconds.
- Phasing should remain consistent for all time periods. As an example, if split phasing is used for the AM peak, it must be used for the PM peak. Changing the phasing sequence such as altering left-turn phasing from leading left to lagging left is dependent on the traffic signal controller equipment.
- Laneage should be identical for all time periods for the same alternative.
- Intersections with combination through/left-turn lanes should have a split phase left-turn treatment for that approach. This is not a recommended geometric configuration, try to avoid if at all possible.

<b>Recommended minimum cycle lengths by phase</b>	
<b>Number of Phases</b>	<b>Minimum Recommended (seconds)</b>
2	60
3	90
4	110
5	110
6	140
8	140
Note: Maximum recommended cycle length is 180, but certain circumstances may warrant cycle lengths up to 240 seconds.	

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## Left Turn Treatment

Use protected left turn treatment not protected/permitted when (a) dual left turn lanes are present, (b) when left-turn lanes are crossing 3 or more opposing through lanes of traffic, or (c) when a condition is satisfied in the table below:

Number of Opposing Lanes (Through and Right)	Condition
1	Left Turn Volume * Opposing Volume > 50,000
2	Left Turn Volume * Opposing Volume > 90,000
3 or more	Left Turn Volume * Opposing Volume > 110,000

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## Additional Guidelines

The use of field values may be used in lieu of these standard values where conditions are not likely to change from the current operation.

- Full storage for queue lengths should be rounded up to the nearest 25 feet with a minimum of 100' for both right-turn and left-turn lanes.
- Ideal Saturated Flow Rate = 1900 vphpl
- The Plan Review Group will provide traffic breakout spreadsheets provided by the Transportation Planning Branch to assist in the conversion of forecasted AADT to Peak Hour Volumes. If this spreadsheet is not used, justification should be provided for any alternate method chosen. This spreadsheet is available on our website. The Plan Review Group will also provide an interpolation spreadsheet to determine intermediate year traffic volumes.
- The Intersection Analysis Utility (IAU) spreadsheet should be used only when traffic forecast volumes are displayed with two-way arrows. The Intersection Analysis Utility for Directional Data (IAU\_directional) spreadsheet should be used only when traffic forecast volumes are displayed with one-way arrows.
- AM and PM Peak hour analysis should be performed for all reports; explanation should be provided for alternate time periods or to not perform an analysis for the AM or PM peak. The requirement to review other key analysis periods, such as a seasonal peak, lunch peak, or weekend peak, should be discussed with NCDOT prior to completion of the traffic analysis.
- System analysis software (such as Synchro) should be used for arterials and multiple signalized intersections. Analyses for roundabouts should use aaSIDRA. For unsignalized intersections, analysis based on HCM procedures should be used.

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## Synchro and SimTraffic

To facilitate review of the traffic analysis, electronic copies of the Synchro data file should be submitted along with the appropriate printouts.

The values stated previously should be correctly applied to the Synchro capacity analyses. Provided below are additional methodologies and inputs in Synchro that should be incorporated into the analyses.

- If there are existing protected/permitted left-turn treatments, lead/lag optimization should be fixed for lead operation for the respective phases.
- Any approaches or movements whose queue length are flagged by a “#” or a “m” should be reviewed for improvements given there may be serious delay and queuing problems for this approach or in the vicinity. These problems will need to be addressed in order for the intersection to operate properly. In these cases, it is recommended the Synchro output should be compared to the SimTraffic output and /or other analysis tools such as CORSIM, VISSIM, or the Red Time Formula. Red Time Formula should only be used for protected phasing when operations are under capacity.
- When creating a Synchro output report, the ‘Intersection: Lanes, Volumes, and Timings’ report will provide all necessary information for review. The data selection “Actuated Green Times” is not necessary information for our review.
- SimTraffic should be utilized to aid in verifying geometry, determining storage lengths and spotting other trouble areas. A SimTraffic queue analysis report should be included for review.
- Networks should be seeded for a period long enough to traverse the network including stops prior to recording. We typically use 10 minutes as a default seed time for the network. Also, the simulation should record for the entire one (1) hour period.
- When evaluating facilities with U-turns, the U-turns should be modeled both as left-turns to obtain an estimation of level of service and as U-turns in SimTraffic to compare to the left-turn level of service and to help determine operations and required storage.

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## Highway Capacity Software (HCS2000)

### General HCS Guidelines

- Due to uncertainty in determining between Rural and Urban conditions and predicting future land use, a PHF of 0.90 should be used, which is a median value between the 0.88 for Rural and the 0.92 for Urban conditions listed in the 2000 HCM.
- Provide output by means of the formatted report.
- Enter  $f_p = 1.00$ , unless in a tourist area, then use 0.95.
- Appropriate terrain should be used depending on location.

- Use the AADT, K (DHV), % Trucks, and D (directional split) provided by the Transportation Branch's forecast. Percent trucks used in the analysis should be the total of TTST and Duals divided by two.
- When U-turns are present, they should be modeled as left-turns to obtain a level of service estimation. This should be compared to a simulation of the U-turns to determine operations and required laneage and storage.

#### HCS Unsignalized Analysis

- Median storage should be zero as a standard unless there is sufficient width to provide adequate storage. Do not enter a storage exceeding one vehicle. No median storage should be used for TWLTL's.
- Enter appropriate information from upstream (per direction) signalized intersections.
- Do not provide an overall level of service (LOS) for unsignalized intersections. According to the 2000 *HIGHWAY CAPACITY MANUAL*, LOS for an unsignalized intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole.

#### HCS Freeway Analysis

- Use the Base Free Flow Speed unless measured flow speeds are available. Base Free Flow Speed for an ideal freeway segment is 70 mph for urban conditions or 75 mph for rural conditions. However, this can be limited by design constraints. Therefore, this should be compared to the design speed of the facility and adjustments made to these inputs, as appropriate.

#### HCS Weaving Analysis

- The Weaving Section Analysis applies to weaving segments up to 2,500 feet maximum.
- Enter the Freeway Free Flow Speed (use the design speed or the posted speed plus 5 mph). Note: typical freeway situations have free-flow speeds of 65mph, collector-distributor (C-D) facilities are 45mph. The analyst can also use the base free flow speed to obtain an estimated free flow speed.
- Check Weaving Area Limitations to ensure that none of the limitations specified are exceeded. Where any limits are exceeded, consult the appropriate notes near the bottom of the output. These situations should be eliminated where feasible and addressed in the included report.

#### HCS Ramp Analysis

- For Freeway Free Flow Speed use the design speed or the posted speed plus 5 mph. Note: typical freeway situations = 65mph. You can also use the base free flow speed to obtain an estimated free flow speed.
- Typical Free Flow Speed for Ramps = 45 mph, and for Loops = 25 mph. These can be adjusted as needed based upon designs if that information is available.
- Enter appropriate information for any adjacent ramps that exist within 6,000 feet of an analyzed on-ramp or within 1,400 feet of an analyzed off-ramp.
- If analysis indicates an LOS F and the freeway is not over capacity, extending the ramp acceleration/deceleration lengths could improve the LOS.

- If the freeway operation is the limiting factor, a failure year and the required number of lanes for adequate level of service should be provided.

### HCS Multilane Analysis

- This methodology does not address highways that have one of the following categories: Signal spacing of 2.0 miles or less, significant presence of on street parking, heavily used bus stops, significant pedestrian activity. Facilities falling under one or more of these categories may be analyzed evaluated with the methodology of Urban Streets (HCS Arterials or Synchro Arterials)
- If no information is available for access points per mile, use 12 for rural sections and 25 for urban sections. If there is potential for rural section to become urban by design year, use 25. This includes right-side only access points. For a one-way roadway it is appropriate to include intersections and driveways on both sides of the roadway. Existing and proposed driveways and intersections may be used where known for specific conditions.
- Use the base Free Flow Speed unless measured flow speeds are available. For Multilane Highways, Base Free Flow Speed may be estimated by increasing the speed limit by 7 mph for 40 and 45 mph, and increasing the speed limit by 5 mph for 50 and 55 mph.

### HCS Two-Lane Highway Analysis

- This methodology does not address two-lane highways with signalized intersections. Two-lane highways in urban and suburban areas with multiple signalized intersections at spacings of 2.0 miles or less can be evaluated with the methodology of Urban Streets (HCS Arterials or Synchro Arterials)
- Enter 100% no passing zones.
- If no information is available for access points per mile, use 12 for rural sections and 25 for urban sections. If there is potential for rural section to become urban by design year, use 25. This includes access points on both sides of the roadway segment. Existing and proposed driveways and intersections may be used where known for specific conditions.
- Use the Base Free Flow Speed unless measured flow speeds are available. For Two-Lane Highways, Base Free Flow Speed may be estimated by increasing the speed limit by 7 mph for 40 and 45 mph, and increasing the speed limit by 5 mph for 50 and 55 mph.

### HCS Arterial Analysis

- Free Flow Speed may be estimated by the speed limit or default values found in the 2000 *HIGHWAY CAPACITY MANUAL*.
- Used when Urban Street criteria are met.

### HCS Signalized Analysis

- Enter Right-turn-on-red (RTOR) as 0.
- Unless you have progressed movements use Arrival Type = 3.
- Enter Unit Extension (normally 3 seconds).
- Enter Start-up Lost Time (normally 2 seconds).



- Enter the Phasing Design. (use 5.0 seconds of yellow time and 2.0 seconds of red time).
- Note that HCS Signalized analysis is recommended only for isolated intersections and even in these cases, it is recommended an optimization software package is used to provide the recommended signal timing.

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## aaSidra

### General aaSidra Guidelines

- When creating an aaSidra output report, the S7 and S15 reports will provide all necessary information for review.
- For proposed roundabouts a minimum lane width of 13 feet should be used.
- For proposed one-lane roundabouts a minimum of 120 feet should be used for the inscribed diameter (88-foot island diameter and 16 foot circulating road width). For proposed two-lane roundabouts a minimum of 148 feet should be used for the inscribed diameter (88-foot island diameter and 30 foot circulating road width).
- If the roundabout operation is a limiting factor, a failure year should be provided. This can be determined by calculating a variable Flow Scale run for the intersection.

### References

The *POLICY ON STREET AND DRIVEWAY ACCESS TO NORTH CAROLINA HIGHWAYS* is the dictating standard related to all aspects of development access for the State of North Carolina. All pertinent standards found within this document shall be implemented during the analysis to provide for the safe, efficient, consistent treatment of the traveling public.

Most signal standards can be found in the *TRAFFIC MANAGEMENT SYSTEMS UNIT DESIGN MANUAL*.

Congestion Management Website:

<http://www.ncdot.org/doh/preconstruct/traffic/congestion/CM/default.html>