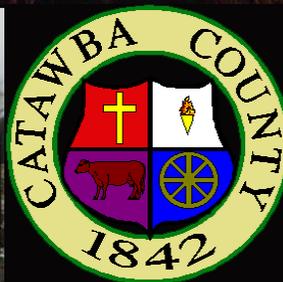
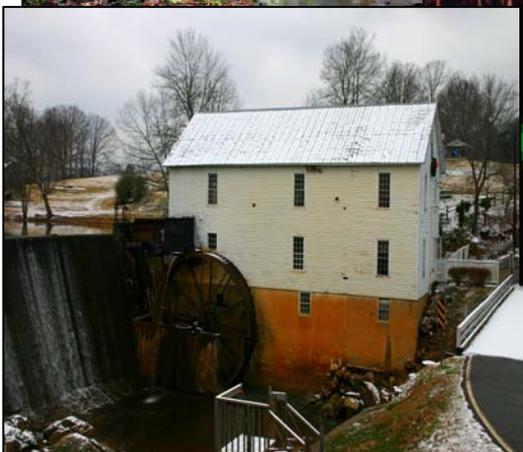
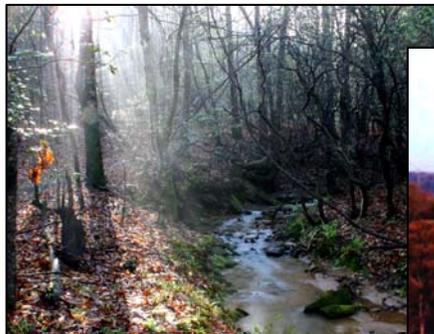




North Carolina Department of  
Transportation  
Transportation Planning Branch  
Mountain Unit

# *Thoroughfare Plan For Catawba County*



July 2007

# CATAWBA COUNTY THOROUGHFARE PLAN

Prepared by:

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In cooperation with:

Catawba County  
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## **Executive Summary**

This report documents the findings of the Catawba County thoroughfare plan study. Recommendations for this study are shown in Figure 1-1 and listed below with a brief description. A more detailed discussion of these recommendations can be found in Chapter 2.

### **Minor Arterials**

- **NC 16 Bypass** - Construction on new location of a 4-lane divided facility from the Town of Lucia in Gaston County to Catawba County. This facility will merge into the existing NC 16 at a location just north of the SR 1895 intersection. This project has been funded for construction and currently listed in the State Transportation Improvement Program (STIP) as project R-2206.
- **NC 16** - Widen the existing 2-lane to a combination of 4-lane divided and 5-lane facility from SR 1895 to Caleb Setzer Road. A part of this project has been funded for construction. This project is listed in the STIP as project R-3100.
- **NC 150** - Widen the existing 2-lane to a 4-lane divided (boulevard type) from Lincoln County to Iredell County. This project is in the STIP (R- 2307) but no funding has been appropriated.
- **NC 127** - Widen the existing 2-lane to a 4-lane divided (boulevard type) from NC 10 to the Jacob Fork River (Hickory-Newton-Conover Urban Area boundary).

### **Major Collectors**

- **Robinson Road Extension** - Extend Robinson Road from a location approximately 1,500 feet north of NC 10 across Rocky Ford Road (SR 2019) and connect to West Maiden Road (SR 2007).

# 1. Introduction

This report documents the findings of a study by the North Carolina Department of Transportation (NCDOT) to update the 1991 Catawba County Thoroughfare Plan. This study was initiated in September of 2000 in response to the request from Catawba County. The study culminated in the adoption of the updated Catawba County Thoroughfare Plan by the County Board of Commissioners on October 25, 2003 and by the North Carolina Board of Transportation on June 3, 2004. The adopted Thoroughfare Plan is shown in Figure 1-1

Thoroughfare planning enables a transportation system to be progressively developed to adequately meet the transportation needs of a community, as land development and traffic volumes increase. Planning for future transportation needs prevents unnecessary costs and impacts to the physical, social, and economic environment. Thoroughfare plan studies are conducted based on the principles outlined in Appendix A.

The purpose of this study was to examine the present and future transportation needs of Catawba County in order to develop an updated thoroughfare plan. The recommendations proposed herein are based on existing roadway conditions and projected growth the County over a twenty-five years planning period. Since actual growth rates and patterns may differ from those anticipated, it may become necessary to update the thoroughfare plan frequently to respond to these changes.

The North Carolina Department of Transportation and Catawba County are jointly responsible for the implementation of the thoroughfare plan. For the planning effort to be effective, the County and State must cooperate in protecting, by various legal means (guidelines set forth in Chapter 5), the right-of-way needed for future roadway improvements. Since transportation needs throughout the State exceed the available funding, local officials should aggressively pursue funding for the County's desired projects.

## **2. Recommended Thoroughfare Plan**

### **Intent of the Thoroughfare Plan**

Transportation is the backbone of a region's economic vitality. Without an adequate transportation system, people can not easily reach their intended destination, goods can not be delivered in a cost effective manner, and investors may look to invest in better served areas. Recent trends such as regional economies; "just in time" delivery, increase automobile ownership, and urban sprawl are taxing existing transportation systems and requiring that more emphasis be placed on planning for our transportation future.

A thoroughfare plan identifies existing and future deficiencies in a transportation system, as well as uncovers the need for new facilities. A county thoroughfare plan also provides a representation of the existing highway system by functional use. This use can be characterized as a part of the arterial road system, the collector road system, or the local road system. A full description of these various systems and their subsystems is given in Appendix A.

This chapter presents the thoroughfare plan recommendations. The goal of this study is to propose a transportation system that will serve the anticipated traffic and land development needs for Catawba County. The primary objective of this plan is to reduce traffic congestion and improve safety by eliminating both existing and projected deficiencies in the County's transportation system. The recommended plan in this study covers only the portion of the County that is outside of the Hickory-Newton-Conover and the Maiden urban areas. Each of these urban areas does have a recommended plan of its own within it's planning area boundary (these urban areas has merged since the adoption of the Catawba County Thoroughfare Plan. See Appendix E for more detail explanation).

### **Thoroughfare Plan Recommendations**

#### Principal Arterial

**US 321** – from Hickory-Newton-Conover planning boundary to Maiden planning boundary

US 321 is a very important corridor both in and outside of Catawba County. This north-south highway is a part of the North Carolina Intrastate System, the Nation Highway System, the Strategic Highway Corridors and the National Truck Network. Regionally, the recently completed freeway section of US 321 in Catawba County provides much needed capacity for the travel flow between the Charlotte and Gastonia Urban Areas to I-40 relieving some pressure on parallel 2- lane highways such as US 16 and US 321 Business. Locally, it relieves congestion on NC 127 in the fast growing Mountain View area. No improvements are needed since this 4-lane divided freeway does have sufficient capacity to handle the projected 2025 traffic of 37,700 vehicles per day (vpd).

### Minor Arterial

**US 321 Business** – Hickory-Newton-Conover MPO boundary to Maiden planning boundary

This minor arterial provides a service for the north-south travel in eastern part of Catawba County. It also provides access to the commercial and residential area in Newton and Maiden. No improvement is need for this 2-lane highway since it does have adequate capacity to handle both existing (8,200 vpd) and projected (11,900 vpd) traffic.

**NC 16** - from Hickory-Newton-Conover planning limit to Lincoln County.

This north-south minor arterial provides multiple travel services for Catawba County. First, it serves as a valuable link for travel between the County and the Charlotte Urban Area allowing for goods and service movements between these areas to operate in an efficient manner. Second, NC 16 serves the rural communities in the southeastern Catawba County by facilitating travel from these areas to the employment and business centers in the major urban centers in the County and the adjacent Counties. This facility currently operates at a level of service C or B with average daily traffic from 7,400 to 9,000 vehicles per day. With the projected 2025 average daily traffic (ADT) between 12,000 to 16,700, this section of NC 16 is expected to deteriorate to a LOS of E to F. Improvements on NC 16 has been scheduled in the State Transportation Improvement Program (STIP). The improvements are divided into two sections. The first section is constructing a bypass paralleling the existing NC 16. This bypass starts at the Town of Lucia in Gaston County and ends at SR 1895 in Catawba County. The cross-section of the bypass is a 4-lane divided with partial control of access. This project is included in the 2002-2008 STIP as project R-2206 and is expected to be completed in 2008. The second section is the widening of NC 16 from SR 1895 to Caleb Setzer Road in Newton. The cross-section of this improvement is a combination of 4-lane divided and 5-lane. This project is included in the 2002-2008 STIP as project R-3100. The estimated cost of project R-2206 and R-3100 is \$44.4 million and 33.7 million, as reported in the 2002-2008 STIP.

**NC 150** - from Lincoln County to Iredell County - Purpose and Need

- **Project Recommendation:** It is recommended that NC 150 be widened to a 4-lane divided facility from NC 27 in Lincoln County to I-77 in Iredell County. The project limits combine for a total of approximately 22.6 miles. This project is included in the 2002-2008 State Transportation Improvement Program (STIP) as project R-2307, which is currently designated as an unfunded project. The estimated cost of this project is \$96.7 million, as reported in the 2002-2008 STIP.

- **Transportation Demand:** This east-west minor arterial serves the inter-county travel in five counties: Cleveland, Lincoln, Catawba, Iredell and Rowan. Major urban areas served by this facility include Shelby, Lincolnton, Mooresville and Salisbury. The section of NC 150 in Catawba and Iredell Counties also serves the fast growing residential and recreational communities in the Lake Norman area.
- **Roadway Capacity and Deficiencies:** With the Average Daily Traffic (ADT) between 9,600 to 13,000 trips per day, the existing roadway is currently operated at a Level of Service (LOS) B to D. At peak hour, some congestion has been experienced in the vicinity of the intersection at Sherill's Ford Road and NC 16. Without any improvement, the entire section of NC 150 in Catawba County will operate at a LOS F where the ADT is projected to be in the range of 26,000 to 35,000 vpd by the year 2025.

#### NC 127 - from Hickory-Newton-Conover planning boundary to NC 10

In Catawba County, this facility provides travel service for the Hickory-Brookford-Mountain View area. In addition to providing a connection for travel between NC 10 to other major highways such as US 321 and I-40, NC 127 also serves a number of developments along its corridor ranging from major residential in Mountain View and northern Hickory to a mix of commercial and governmental offices in downtown Hickory. The existing cross-section of NC 127 is composed of 3 segments: 2 lanes in northern Hickory north of Cloninger Road, 4-5 lanes between Cloninger Road to Zion Church Road in Brookford, and the segment south of Zion Church Road varies between 2-3 lanes. The majority of NC 127 in Catawba County is inside the planning area of the Hickory-Newton-Conover MPO which extends to the Jacob Forks River. To accommodate the projected traffic growth, the 2-3 lanes segment is recommended in the MPO's thoroughfare plan to be widened to 4-lane divided boulevard cross-section. For the segment in Catawba County south of the MPO, the 2025 projected traffic is 19,100 vpd. It is recommended that this segment be widened to a 4-lane divided boulevard.

#### Major Collectors

**NC 18** - This major collector serves the western most part of Catawba County providing for inter-county traveling between Caldwell, Burke, Catawba and Lincoln Counties. No improvement is need for this 2-lane highway since it does have adequate capacity to handle both existing (3,000 vpd) and projected (4,900 vpd) traffic.

#### NC 10 – Outside of the Hickory-Newton-Conover MPO planning boundary

This highway serves the east-west travel in the County. It runs through a number of small rural communities, collects the traffic and distributes the trips onto the principal and minor arterials. Part of NC 10, from South Fork River to Claremont Road in Newton, lies in the Hickory-Newton-Conover MPO planning area. For more information on this section, see Hickory-Newton-Conover Urban Area Transportation Plan –

Technical Update #1 Report. On the part of NC 10 west of South Fork River (to Lincoln County), capacity problems will be experienced in locations where the highway intersects other major roads such as NC 127 and SR 1008. A left turn lane is recommended for these intersections to relieve the potential congestion. No improvements will be needed for the part of NC 10 east of Claremont Road.

**Startown Road (SR 1005)** – Outside of the Hickory-Newton-Conover MPO planning boundary

This 2-lane major collector serves the north-south travel in the southern part of Catawba County. It terminates at US 70 connecting to the southern end of the proposed Eastside Thoroughfare. The heaviest travel on Startown Road occurs in the vicinity of US 70 inside the Hickory-Newton-Conover MPO where the daily volume reaches 11,000 vpd. Outside of the MPO (the portion that covered in this study), the volume drops to around 6,400 vpd. The trend-line shows that the traffic on this section of Startown Road has been growing at annual rate of 3.8%. However, the effect of the proposed Robinson Road Extension (parallel to Startown Road south of NC 10) will temper the growth rate to a moderate 2% per year which projects the traffic volume to 12,000 vpd in 2025. No improvement is recommended for this road.

#### **Robinson Road (SR 1146) Extension**

Robinson Road is classified as a minor collector serving the north-south travel in central Catawba County. It terminates at NC 10 on the southern end and at US 70 on the northern end connecting to Lenoir-Rhyne Boulevard. This 2-lane road lies entirely inside the Hickory-Newton-Conover MPO. In the vicinity of NC 10, traffic volume on Robinson Road is about 4,600 vpd. The 2025 projection on this road is 11,600 vpd.

The proposed Robinson Road Extension starts from a point approximately 1,500 feet north of NC 10 intersection. From this point, the road extends southward crossing NC 10, paralleling US 321 Freeway connecting to West Maiden Road (SR 2007) at Startown Road (SR 1005). This 2-lane facility was proposed for two reasons; to provide continuity and additional capacity. This route, when complete, will provide an alternate way for traveling between the major shopping area in Hickory and the resort community of Lake Norman via West Maiden Road. This route will also provide needed capacity to serve the traffic that will be generated from the anticipated growth along US 321 freeway west of Startown Road. Without this extension, Startown Road will be overcapacity.

#### Minor Collectors

**West Maiden Road (SR 2007)** – from Maiden Planning boundary to Startown Road (SR 2005)

Locally, this 2-lane minor collector provides connecting service for travel between Maiden and US 321 Freeway via Startown Road. Regionally, it will be a part of the

future road system that provides service between Lake Norman area and the shopping area along US 70 in Hickory. No improvement is recommended for this road.

### Other Minor Collectors

The following minor collectors are roads that will need minor widening for safety reasons. Most of these roads are between 18 to 20 feet in cross section. It is recommended that these roads be widened to the minimum tolerable lane widths when funding is available.

Rhoney Farm Road (SR 1002)  
Buffalo Shoals Road (SR 1003)  
Zion Church Road (SR 1008)  
Old Catawba Road (SR 1722)  
Boggs Road (SR 1727)  
Balls Creek Road (SR 1810)  
Bandys Cross Road (SR 1813)  
Little Mountain Road (SR 1815)  
Sherrills Ford Road (SR 1848)  
East Maiden Road (SR 1855)  
Plateau Road (SR 2036)

### **Bicycle Routes**

Catawba County has been working with NCDOT on establishing a bicycle route mapping and signing plan for the County. The project is shown in the 2000-2006 TIP as E-3812. The Bicycle Plan will be incorporated into the Thoroughfare Plan once it is completed.

### **Public Involvement**

The study to update Catawba County's Thoroughfare Plan was started in response to a request from Catawba County in September of 2000. NCDOT officials met with the Catawba County Director of Planning and Development and his staff on October 4, 2000. This meeting was held to present information on the thoroughfare planning process and to gather input on the transportation needs of the County. The preliminary Thoroughfare Plan Recommendations was presented at the Ball's Creek Small Area Plan meeting on October 1, 2001 and subsequently at the Sherrill's Ford Small Area Plan meeting on October 18, 2001. Likewise, the Planning Board received a presentation on the Plan at its February 25, 2002 meeting. Comments and suggestions from these meetings were evaluated and incorporated accordingly. Public Workshops on the recommended Thoroughfare Plan were held on October 17, 2002 at Startown Elementary School and on October 30, 2002 at Sherrill's Ford Elementary School. Comments were addressed and incorporated accordingly. A Public Hearing on the Plan was held at the Catawba County Planning Board meeting on September 29, 2003 in Newton. After the hearing, the Board recommended forwarding the Plan to the Catawba County Board of Commissioners. The Catawba County Thoroughfare Plan was approved and adopted by the Board of

Commissioners on October 20, 2003. The North Carolina Board of Transportation adopted the Plan on June 3, 2004.

### **3. Catawba County – Population, Land Use and Traffic**

Catawba County is located in the western part of the state in the foothills of the Blue Ridge Mountains (Figure 3-1). The County covers 405 square miles sharing its boundary with five other counties: Alexander and Caldwell to the north, Burke to the west, Lincoln to the south and Iredell to the east. The topography is gently rolling except for land immediately adjacent to streambeds where slopes in excess of 15% may be found.

The County Seat is the City of Newton. It is one of the 3 larger cities in the County, with the other two being Hickory and Conover. Other cities and towns in the County are Brookford, Catawba, Claremont, Long View and Maiden. Overall, approximately one-third of the county was considered as urban and this area has been expanded rapidly in the last couple of decades. In 1980, the Hickory-Newton-Conover area was designated as one of fifteen urbanized areas in the State of North Carolina. The Hickory area now ranks 7 of 14 in terms of population among North Carolina's urbanized areas.

Most of the industrial, commercial and business activity in the County is located in the vicinity of the Hickory-Newton-Conover Urban Area. However, some of the major industries are also located in smaller towns scattered throughout the County. As the central county of North Carolina's fourth largest Metropolitan Statistical Area (MSA), Catawba County has successfully diversified and balanced its traditional manufacturing base of furniture, textile, and telecommunications. However, the recent layoff of the employment within these sectors has been a challenge to the manufacturing base that has benefited the County's economy. Comprehensive efforts are being directed at identifying and recruiting new sectors in manufacturing such as biomedical, pharmaceutical, technology and building products, and identifying and recruiting non-manufacturing sectors such as retirement and retail development.

The principal east-west arteries in the County are I-40 and US 70. US 321 is the north-south principal arterial. Other major highways in the County are US 321 Business, NC 127, NC 150, NC 18, NC 16 and NC 10. Southern Railway provides freight service to industries in the area. Private air service is available at the Hickory Regional Airport.

#### **Population Trends**

The magnitude of traffic on a particular roadway section is a function of the size and location of the population it serves. An analysis of the past and present population trends provided the basis for projecting the future population and traffic. Table 3-1 shows the historical and projected population trends for Catawba County through 2025.

Table 3-1  
Historical and Projected Population Trends in Catawba  
County

<b>Year</b>	<b>Population</b>	<b>Change</b>	<b>% Annual Growth Rate</b>
1940	51,653		
1950	61,794	10,141	1.8
1960	73,191	11,397	1.7
1970	90,873	17,682	2.2
1980	105,208	14,335	1.5
1990	118,821	13,613	1.2
2000	142,488	23,667	1.8
2005	149,032	6,544	0.9
2025	185,911	36,879	1.1

During the period spanning 1940 to 1970 Catawba County's population grew at a fast pace, with an average annual growth rate ranging from 1.7% to 2.2%. By 1970, the County's population had increased by 43% to 90,873. During the 1970 to 1990 period, the annual population growth rate leveled off to 1.5% and 1.2 % respectively. The County's population still grew by 27,539 during this period. The combination of migration from other parts of the country, and a good overall economy brought the population growth in the County back up to 1.8% in the 1990-2000 period. The effects of a slow down in the County's traditional industries will somewhat dampen future population growth. Nonetheless, with expectations of continued population growth fueled by migratory inflow, the County's population is still expected to grow at a pace of 1.1% annually during the projected 2005-2025 period.

### **Land Use**

For transportation planning purposes, land uses are grouped into three broad categories: (1) Residential – all land devoted to the housing of the County's population, excluding hotels and motels; (2) Commercial – all land devoted to retail trade, business services, and offices; and (3) Industrial – all land devoted to manufacturing, assembly, warehousing and industrial offices. Mapping of existing land uses are shown in Figure

3-2 and projected 2025 land uses are shown in Figure 3-3.

## **Residential**

Residential land uses comprise the largest percentage of the land area within the County's planning area. Housing density throughout the County's planning area is relatively low, with several exceptions including the Sherrills Ford community along Lake Norman, and the Mountain View community, which is currently located within the Greater Hickory MPO. Aside from these particular areas, housing has clustered in close proximity to major roadways and near the boundaries of the County's municipalities.

Catawba County anticipates similar residential growth patterns within the projected 2025 growth period. Such development is expected to develop at densities ranging from 1 unit per acre to 3 units per acre. However, the availability of physical infrastructure, namely public water and sewer, will greatly impact the rate and density of residential development. A number of large vacant tracts of property are currently available for development. Should water and sewer be provided, these properties could conceivably yield many more homes than initially anticipated. One specific area that may be outside the previously discussed projected residential densities is the Sherrills Ford community, where several large residential developments are in the initial planning stages that include upwards of 2,000 residential dwelling units.

## **Commercial**

Much of the commercial development within Catawba County is located within its municipalities, which are part of the Greater Hickory MPO excluding the Towns of Maiden and Catawba. Commercial development within Catawba County, excluding the Greater Hickory MPO planning area, has occurred mainly along or at the intersections of major roadways. This is most noticeable along the NC 16, NC 150, NC 10, and US 321 corridors. In the east the intersection of NC 16 and NC 150 has recently seen a noticeable amount of new commercial development. The corridors of both roadways have also individually seen much new commercial growth feeding off the new residential development coming into southeastern Catawba County.

The Towns of Maiden and Catawba, which in 2000 were not part of the MPO, each contain large concentrations of commercial development. Much of the commercial development in Maiden is located either along Business US 321 or East Maiden Rd, while commercial development within the Town of Catawba is concentrated along NC 10.

In the central and southwestern portions of Catawba County commercial growth has followed similar patterns. Both US 321 Business and NC 10 have concentrations of commercial development, which has the tendency to coalesce at new interchanges and intersections. The County also anticipates increases in small-scale commercial growth at its defined rural commercial nodes in the southwest portion of the county. Such nodes are defined through the comprehensive planning process and are typically located at

historical commercial intersections, or at future proposed intersections.

Future commercial growth within Catawba County is expected to follow similar trends, as can be observed in Figure 3-3. Such growth is expected to expand along NC 10 in the southwestern portion of the County, as well as along NC 150 in the southeast. Commercial growth is also expected to expand at intersections of major roadways, with the intention of providing convenience goods and services to nearby residential areas. A potential major commercial development along NC 150 at its intersection with Slanting Bridge Rd is currently in its early planning stages. The development is proposed to consist of large commercial and office uses, as well as residential uses (please refer to Figure 3-3).

### **Industrial**

The vast majority of industrial development located within the planning area of Catawba County is located along Business US 321 (see Figure 3-2). In addition to this noticeable concentration, smaller industrial concentrations are present along NC 10. Industrial growth over the planning horizon is anticipated to occur along the US 321 corridor and within the area surrounding I-40 near the Catawba County – Iredell County line; both of which are located within the Greater Hickory MPO. Some large industrial employers are also located within the Town of Maiden which in the year 2000 was not part of the MPO. In Maiden industrial development is concentrated along Business US 321.

Other major industrial locations include Duke Power's Marshall Steam Station and a number of other industries in the southeast. Several large facilities owned by CommScope in the eastern part of the County, and numerous rural industrial uses in the southwestern part of the county.

### **Traffic**

A comparison of 1989 and 2000 annual average daily traffic (ADT) volumes on selected major roads and highways in Catawba County are shown in Figure 3-4. Also shown are projections for the year 2025, assuming no changes to the existing street system is made. These projections were based on historical and anticipated population and economic growth patterns, land-use and traffic growth trends and anticipated automobiles and trucks growth.

Motor vehicle registration for 2000, 1989, 1985, 1982 and 1978 are given in Table 3-2. Both automobile and truck registration suffered a dramatic decline from 1978 to 1982. This decline was the result of the gas crisis of the early eighties. From 1982 to 1985, registrations rebounded to the level that existed in 1978. Automobile and truck registrations have increased steadily since 1985. They are projected to grow at an annual rate of 1.0% and 1.5% respectively between 2000 and 2025.

Table 3-2  
Historical and Projected Autos & Trucks in  
Catawba County

<b>Year</b>	<b>2025</b>	<b>2000</b>	<b>1989</b>	<b>1985</b>	<b>1982</b>	<b>1978</b>
Autos	153,103	119,238	75,828	64,372	58,779	66,659
Trucks	55,397	38,180	28,659	22,205	19,706	21,507

## **4. Analysis of Catawba's Roadway System**

This chapter presents an analysis of the ability of the existing roadway system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies, but also on understanding their cause. Travel deficiencies may be localized and the result of substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be a system deficiency such as a need for a bypass, loop facility, construction of missing links, or additional radials.

Analysis of the roadway system involves examination of the existing travel patterns and identification of existing deficiencies. Roadway capacity and safety analyses are also essential in evaluating the existing transportation system. After a picture of the existing travel conditions has been developed, factors that will impact the future transportation system must be analyzed. These factors include projected population growth, economic development potential and land use trends. This information is used to determine anticipated future deficiencies in the transportation system.

### **Current Transportation Plans for Catawba County**

#### **Thoroughfare Plans**

A thoroughfare plan is a tool to aid officials in the development of an appropriate transportation system. It is important that the communities within a county and county officials cooperate in the development of their transportation system. Thoroughfare plan development and implementation, jointly undertaken, will help ensure the development of an efficient system for travel throughout the county. The following thoroughfare planning studies have previously been done for Catawba County:

1. Catawba County, plan adopted in 1991\*
2. Hickory-Newton-Conover MPO, plan adopted in 2001
3. Maiden, plan adopted in 1989

\* Thoroughfare plan currently is being updated

#### **Transportation Improvement Program Projects**

The Transportation Improvement Program (TIP) is a seven-year project planning document that lists the major transportation improvement projects planned by the North Carolina Department of Transportation (NCDOT). In addition to roadway projects, the TIP includes funding for bridge replacements, highway safety projects, enhancement projects, environmental mitigation, railroad crossings, bicycle facilities, and public transportation. Listed below are projects identified in the 2002 – 2008 TIP for Catawba County.

##### **1. I-40**

I-3302: SR 1717 (Exit 138) to west of SR 1512 (Exit 146) in Iredell County. Pavement and bridge rehabilitation.

**2. US 321**

R-85: NC 27-150 in Lincolnton to NC 127 in Hickory. Four-lane divided facility on new location.

**3. NC 16**

\*R-2206: South of Lucia in Gaston County to SR 1895 in Catawba County. Four-lane divided facility on new location.

**4. NC 16**

\*R-3100: North of SR 1895 to SR 1800 southeast of Newton. Widen roadway to multi-lane.

**5. Newton-Conover Loop**

U-2404: From NC 16 south of Newton to NC 16 north of Conover. Construct a five-lane curb and gutter facility

**6. Lenoir Rhyne Boulevard Extension.**

U-2306: From Tate Blvd. NE to 8<sup>th</sup> Street NE. Widen to multi-lane. Part on new location and realign 8<sup>th</sup> Street NE to connect with Highland Avenue NE.

**7. East Side Thoroughfare**

\*U-2307: From US 70 to NC 127. Multi-lane facility. Part on new location.

**8. Tate Boulevard Extension**

U-2414: East of SR 1468 (Sweetwater Road) to I-40. Widen SR 1692 to multi-lane, construct a multi-lane connector from SR 1692 to SR 1007 and widen SR 1007 to multi-lane.

**9. Northwest Loop**

\*U-2528: From 33<sup>rd</sup> Street at I-40 to Airport Road at US 321. Multi-lane improvements. Connector on new location and a new interchange at SR 1124 and I-40.

**10. NC 127 and SR 1213**

\*U-2530: Widen NC 127 to multi-lanes from SR 1132 to SR 1008 and upgrade and extend SR 1213. Proposed US 321-NC 127 interchange at SR 1184.

**11. US 321 to NC 127**

\*\*U-3614: Construct a two-lane facility on four-lane right-of-way. Some new locations.

**12. I-40**

\*\*I-906: From SR 1484 (4<sup>th</sup> Avenue) in Conover to SR 1717(Exit 138). Concrete pavement and seven bridge deck rehabilitation.

**13. I-40**

\*\*I-2802: From Burke County line (mile post 120) to SR 1484 (4<sup>th</sup> Avenue). Pavement rehabilitation, bridge and safety improvements.

#### **14. Newton-Conover West Loop**

\*\*U-2529: From SR 1476 (Fairgrove Church Road), NC 10 southwest of Newton to SR 1491 (Section House Road). Widen to multi-lane and construct a multi-lane connector on new location.

#### **15. Hickory North Crosstown Loop**

\*\*U-2531: From NC 127 to NC 16 in Conover. Construct a multi-lane facility on new location.

#### **16. Southern Loop**

\*\*U-2532: From I-40 at SR 1124 to US 321 in Newton. Construct a multi-lane facility on new location.

#### **17. 13<sup>th</sup> Avenue SE Extension**

\*\*U-2535: From sR 1007 (Lenoir Rhyne Boulevard) to SR 1468 (Sweetwater Road). Construct multi-lane on new location.

#### **18. Newton-Conover South Loop**

\*\*U-3450: From NC 10 West to NC 16. Construct a two-lane facility with paved shoulders, part on new location.

#### **19. NC 127**

\*\*U-3603: from SR 1400 (Cloninger Mill Road)to SR 1156 (Richie Road) in Alexander County. Upgrade two-lane facility and provide some five-lane curb and gutter.

#### **20. US 321-NC 127 Connector**

\*\*U-3614: Two lanes on four lanes Right-Of-Way. Some new locations.

#### **21. Bridge Projects**

B-4456: I-40 – Replace bridge #49

B-4061: Hagan Creek. SR 1727 – Replace bridge #90

B-4457: Clark Creek. SR 2012 – Replace bridge #120

B-4458: South Fork Catawba River. SR 2019 – Replace bridge #95

B-2813: Jacobs Fork Creek. SR 1008 – Replace bridge #54.

B-4059: Anthony Creek. SR 1156 – Replace bridge #79.

B-2940: Clark Creek. SR 1165 – Replace bridge #82.

B-4060: Creek. SR 1486 – Replace bridge #17.

B-3822: Creek. SR 1706 – Replace bridge #8.

B-2941: McLin Creek. SR 1722 – Replace bridge #94.

B-4061: Hagan Creek. SR 1727 – Replace bridge #90.

B-4062: Pinch Gut Creek. SR 1880 – Replace bridge #127 with Culvert.

B-3132: NC 127. Main Avenue – Replace deck bridge #75

\* Project listed in TIP, but only partially funded

\*\* Project listed in TIP, but no funds have been assigned.

## Existing Travel Patterns and Deficiencies

### Traffic Demand

For the purposes of a thoroughfare plan study, roads that are functionally classified are principally the ones studied. Appendix A provides an explanation of functional classification. Travel demand on these facilities is measured in the form of average daily traffic counts. Traffic counts are periodically taken by the NCDOT throughout the state, including many locations in Catawba County. The 2000 average daily traffic (ADT) for Catawba County's thoroughfare plan roads is shown in Figure 3-4 and listed in Appendix B, Table B-1.

### Width and Alignment Deficiencies

NCDOT's roadway design standards establish criteria for minimum pavement widths, dependent on the type of facility, the design speed, and the current and design year ADT. These criteria call for 12-foot lanes for all highways with design speeds greater than 50 miles per hour (mph) and design year ADT greater than 2,000 vehicles per day (vpd). However, roads with lower speeds and ADT are designed with lane widths as narrow as 10 feet. In addition to criteria for designing new facilities, there are standards for minimum tolerable lane widths on existing roads. These minimum tolerable lane widths are summarized below in Table 4-1.

**Table 4-1**

<b>Minimum Tolerable Lane Widths</b>			
Average Daily Traffic (vpd)	Principle Arterials (ft)	Minor Arterials (ft)	Collectors (ft)
Over 2000	11	11	11
400 - 2000	-	10	10
100 - 400	-	10	9
Below 100	-	-	9

There are a number of roads in Catawba County that have substandard widths. Due to the substantial cost of upgrading all secondary roads to standard 12-foot lanes, narrower widths may have to be tolerated until sufficient funds are available for improvements. The roads identified as part of the Catawba County's Thoroughfare Plan study that have substandard widths and, based on the volume of traffic on the road, are recommended to be widened to 12-foot lanes are listed below.

- Rhoney Farm Road (SR 1002)
- Buffalo Shoals Road (SR 1003)
- Zion Church Road (SR 1008)
- Old Catawba Road (SR 1722)
- Boggs Road (SR 1727)
- Balls Creek Road (SR 1810)
- Bandys Cross Road (SR 1813)
- Little Mountain Road (SR 1815)

- Sherrills Ford Road (SR 1848)
- East Maiden Road (SR 1855)
- Plateau Road (SR 2036)

Capacity Analysis of the Existing System (Area outside of the Hickory-Newton-Conover and Maiden Planning limit)

The adequacy of the existing roadway system is evaluated by comparison of traffic volumes to the ability of the roads to move traffic freely at a desirable speed. The ability of a facility to move traffic freely, safely, and efficiently with minimum delay is controlled primarily by the type and spacing of traffic control measures. Thus, the ability of a road to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by applying other traffic engineering strategies.

Capacity is the maximum number of vehicles which have a “reasonable expectation” of passing over a given section of roadway, during a given time period under prevailing roadway and traffic conditions. Roadway capacities and average daily traffic for facilities in Catawba County are shown in Figure 3-4 and listed in Appendix B, Table B-1. Currently, the following facility in Catawba County is nearing capacity:

- NC 150: From SR 1848 (Sherrills Ford Road) to Iredell County

The relationship of traffic volumes to the capacity of the road determines the level of service (LOS) provided. Six levels of service have been defined, with letter designations from A to F. LOS A represents the best operating conditions and LOS F represents the worst.

The definitions of levels of service are general and conceptual in nature. Levels of service for interrupted flow, or signalized facilities, vary widely in terms of both the users perception of service quality and the operational variables used to describe them. The 1995 Highway Capacity Manual contains more detailed descriptions of the levels of service as defined for each facility type. The six levels of service, whose definitions follow, are illustrated in Figure 4-1.

## Levels of Service

### **LOS A**

Describes primarily free flow conditions. Motorists experience high levels of physical and psychological comfort. The effects of minor incidents of breakdown are easily absorbed. Even at the maximum density, the average spacing between vehicles is about 528 feet, or 26 car lengths.

### **LOS B**

Represents reasonably free flow conditions. The ability to maneuver within the traffic stream is only slightly restricted. The lowest average spacing between vehicles is about 330 feet, or 18 car lengths.

### **LOS C**

Provides for stable operations, but flows approach the range in which small increases will cause substantial deterioration in service. Freedom to maneuver is noticeably restricted. Minor incidents may still be absorbed, but the local decline in service will be great. Queues may be expected to form behind any significant blockage. Minimum average spacings are in the range of 220 feet, or 11 car lengths.

### **LOS D**

Borders on unstable flow. Density begins to deteriorate somewhat more quickly with increasing flow. Small increases in flow can cause substantial deterioration in service. Freedom to maneuver is severely limited, and drivers experience drastically reduced comfort levels. Minor incidents can be expected to create substantial queuing. At the limit, vehicles are spaced at about 165 feet, or 9 car lengths.

### **LOS E**

Describes operation at capacity. Operations at this level are extremely unstable, because there are virtually no usable gaps in the traffic stream. Any disruption to the traffic stream, such as a vehicle entering from a ramp, or changing lanes, requires the following vehicles to give way to admit the vehicle. This establishes a disruption wave that propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing. Vehicles are spaced at approximately 6 car lengths, leaving little room to maneuver.

### **LOS F**

Describes forced or breakdown flow. Such conditions generally exist within queues forming behind breakdown points.

**Figure 4-1**  
**Levels of Service**

**Back of Figure 4-1**

Traffic Crashes

Traffic crash statistics can often be used as an indicator for locating congestion problems. Traffic crash records can also be reviewed to identify problem locations or deficiencies such as substandard design, inadequate signing, ineffective parking, or poor sight distance. Crash patterns identified from analysis of crash data can lead to improvements that will reduce the number of crashes.

The NCDOT Traffic Engineering and Safety Systems Branch periodically reviews crash data statewide to identify areas where crash rates may be reduced as a result of roadway improvements. The Highway Safety Improvement Program identifies the highest crash intersections so that they may be studied further. In order to be included in the program, each location must meet one of several warrants, or minimum criteria. For intersections, the categories of warrants are front impact crash rate (Warrant I-1), previous year crash rate (Warrant I-2), severity index levels (Warrant I-3), night crash rate without streetlights (Warrant I-4), and chronic intersection locations (Warrant I-5).

Intersection Warrants	Types of Crashes
Warrant I-1 (Frontal Impact)	Angle Left / Right Turn Same Road Left / Right Turn Different Road Head On
Warrant I-2 (Last Year Crashes)	Previous year crash rate
Warrant I-3 (Frequency with a Severity Index Minimum)	Severity index levels
Warrant I-4 (Night Crashed Without Streetlights)	Night crashes
Warrant I-5 (Chronic Intersection Locations)	Rear End Crashes Ran Off Road Crashes Crossing Pattern Crashes Right Turn Other Modes (Includes pedestrian, bicycle, moped crashes)

In addition to intersections, roadway sections are also evaluated for high crash frequency. Like intersections, these sections of roadway must meet one of several warrants, or minimum criteria to be included in the Highway Safety Improvement Program. These warrants are given below.

Section Warrants	Types of Crashes
Warrant S-1	Ran off road during wet condition crashes
Warrant S-2	Ran off road crashes
Warrant S-3	Wet condition crashes
Warrant S-4	Non-Intersection night crashes without streetlights

Crash data is given by type in order to identify any trends that may be correctable through roadway or intersection improvements. Table 4-2 gives a summary of the intersections in Catawba County with the highest crash rates (area outside of the Hickory-Newton-Conover and Maiden Planning limit). Figure 4-2 shows the location of those intersections. For each intersection, the total number of crashes is given as well as the crash type. The criterion used to identify these locations includes 10 or more crashes within 150 feet of an intersection over a one-year period, between January 1999 and December 2000.

To request a more detailed crash analysis for any of the following intersections or other intersections of concern, the appropriate Regional Traffic Engineer, which is High Country & Foothills Region for Catawba County, should be contacted.

High Country & Foothills Region (Serves Divisions 11 and 12)  
 Regional Traffic Engineer  
 PO Box 47, Shelby, 28151-0047 (Mail)  
 1710 East Marion Street, Shelby, 28150 (Delivery)  
 (704) 480-9034

**Table 4-2**

<b>Catawba County Highest Crash Intersections</b>				
<b>Location Number</b>	<b>Intersection</b>	<b>Type of Reported Crashes</b>		<b>Total</b>
1	NC 16/NC 150	6	Angle	17
		6	Rear End, Slow or Stop	
		2	Left Turn, Same Roadway	
		1	Backing Up	
		1	Left Turn, Different Roadways	
		1	Parked Motor Vehicle	
2	NC 10/NC 127	7	Rear End, Slow or Stop	16
		6	Left Turn, Same Roadway	
		2	Angle	
		1	Fixed Object	
3	NC 150 / SR 1844	5	Left Turn, Same Roadway	15
		3	Angle	
		3	Rear End, Slow Or Stop	
		2	Fixed Object	
		1	Left Turn, Different Roadways	
		1	Right Turn, Same Roadway	
4	NC 16 / SR 1810	4	Left Turn, Same Roadway	13
		4	Rear End, Slow or Stop	
		2	Left Turn, Different Roadways	
		1	Angle	
		1	Animal	
		1	Fixed Object	

Existing Bridge Conditions

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or deficiency in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, and most importantly, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons, it is imperative that bridges be constructed to the same design standards as the system of which they are a part.

Congress enacted the National Bridge Inspection Program Standards on April 27, 1971, implementing the Federal Highway Act of 1968. These standards require that “all structures designed as bridges located on any of the Federal-Aid Highway Systems be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years.” The NCDOT Bridge Maintenance Unit, with assistance from various consultants, inspects all bridges on the State Highway System.

The Transportation Improvement Program (TIP) development process for bridge projects involves consideration of several evaluation methods in order to prioritize needed improvements. A

sufficiency index is used to determine whether a bridge is sufficient to remain in service, or to what extent it is deficient. The index is a percentage in which 100 percent represents an entirely sufficient bridge and zero represents an entirely insufficient or deficient bridge. Factors evaluated in calculating the index are listed below.

- structural adequacy and safety
- serviceability and functional obsolescence
- essentiality for public use
- type of structure
- traffic safety features

A bridge is considered deficient if it is either structurally deficient or functionally obsolete. Bridges in the functionally obsolete category have below average ratings in approach roadway alignment, under clearance, deck geometry, waterway adequacy, or structural condition. Structurally deficient bridges have below average ratings in deck superstructure, substructure, overall structural conditions, or waterway adequacy. A bridge must be classified as deficient before it is eligible for Federal Bridge Replacement Funds. The sufficiency rating must be less than 50 to qualify for replacement or less than 80 to qualify for rehabilitation under federal funding.

In addition to the sufficiency index, further analysis is performed using the Level of Service Analysis and Prioritization (LOSAP) program. This program ranks bridges by deficiency points, which are calculated based on maintaining desired levels of service. The levels of service for lane and shoulder width, vertical clearance, and load capacity vary with roadway functional classification and average daily traffic. Another tool for prioritizing bridge improvements is the Optimum Bridge Budget Forecasting and Allocation System (OPBRIDGE). This program determines the optimum improvement action and time for each bridge in a network given certain level of service goals and funding constraints.

The output from each of these evaluation methods, along with input from NCDOT Bridge Maintenance personnel and local communities, is used to prioritize bridge projects. Bridges with the highest priority are replaced as federal and state funds become available.

All bridges in Catawba County have been analyzed, rated, and inventoried. Table 4-3 shows all structurally deficient bridges and Table 4-4 shows all functionally obsolete bridges that are outside the Hickory-Newton-Conover and Maiden planning limit . The locations of those bridges are shown in Figure 4-3.

**Table 4-3**

<b>Structurally Deficient Bridges in Catawba County</b>			
Bridge No.	Facility Carried	Water Source	Rating
90*	SR 1727 (Boggs Road)	Hagan Creek	19.5
73	SR 1002 (Rhoney Farm Road)	Creek	33.5

Notes: \* Denotes the bridge is in the current Transportation Improvement Program.

**Table 4-4**

<b>Functionally Obsolete Bridges in Catawba County</b>			
Bridge No.	Facility Carried	Water Source	Rating
99	NC 150	Seaboard Coastline RR	71.2
154	SR 1813 (Bandy's Cross Road)	Balls Creek	78.4
160	SR 1832 (Kale Road)	Balls Creek	68.8
276	SR 1833 (Long Island Road)	Southern RR	77.6
278	SR 1848 (Sherill's Ford Road)	P&N Access RR	76.4

Notes: \* Denotes the bridge is in the current Transportation Improvement Program.

### **Forecasted Travel Patterns and Deficiencies**

#### Future Travel Demand

Future travel demand can be forecasted by looking at past traffic trends and calculating the average annual growth rates for specific routes. Using historical traffic trends, along with projected land use and projected population growth, future travel demand can be estimated and future transportation deficiencies can be identified. For this thoroughfare plan study average daily traffic (ADT) counts since 1978 were used in a linear regression analysis to estimate ADT for the planning year 2025. The projected 2025 ADT for Catawba County's Thoroughfare Plan roads are shown in Figure 3-4 and listed in Appendix B, Table B-1.

#### Capacity Deficient Corridors

Capacity deficient corridors are identified using the volume to capacity ratio (V/C), which is the projected traffic over the practical capacity of the facility for a given level of service (LOS). For this analysis, capacity is based on LOS E. A V/C ratio greater than one indicates the volume of traffic on the road exceeds its capacity and the facility should be considered for improvement. Based on this analysis, the roads in Catawba County listed below are anticipated to be over capacity by the planning year 2025.

- NC 150: From NC 16 to Iredell County.
- NC 16: From Hickory-Newton-Conover MPO planning limit to SR 1003.
- NC 127: From Hickory-Newton-Conover MPO planning limit to NC 10.

NC 150 and NC 16 are scheduled for improvements in the 2002-2008 Transportation Improvement Program (TIP). Refer to Chapter 2 for recommendations. Widening these facilities will increase their traffic carrying ability and alleviate traffic congestion. The existing and recommended capacities, right-of-way, and cross sections for Catawba County's functionally classified roads are given in Appendix B, Table B-1.

#### Roads Approaching Capacity

Roads in the planning area that are expected to be near capacity within the planning period are listed below:

- US 321B: From Hickory-Newton-Conover MPO planning boundary to Maiden planning boundary.
- NC 16: From SR 1003 to SR 1895.
- NC 10: From Hickory-Newton-Conover MPO planning boundary to SR 1002.
- Startown Road from Hickory-Newton-Conover MPO planning boundary to Maiden planning boundary.

Refer to Chapter 2 for recommendations. Widening these facilities will increase their traffic carrying ability and alleviate traffic congestion. The existing and recommended capacities, right-of-way, and cross sections for Catawba County's Thoroughfare Plan roads are given in Appendix B, Table B-1.

### System Deficiencies

System deficiencies result in areas that lack a cohesive, continuous, and complimentary major road network. More simply put, a system deficiency exists when drivers must go out of their way to get to their desired destination, or when the route is not cohesive or continuous. For Catawba County, no system deficiencies were identified that warrant improvements.

### Intersection Deficiencies

Ineffective intersection design or control can contribute to poor traffic flow, increased traffic accidents, and driver irritation. Most of the major traffic intersections in Catawba County are located within the municipalities. The intersection of NC 10 and SR 1008 suffers from operational deficiency due to the inadequate left turn storage. The County should cooperatively work with the Department of Transportation, Division 12 to improve safety and efficiency at this location. An analysis of Catawba County's roadway system did not reveal any other intersection deficiencies.

**Figure 4-2**  
**High Crash Locations**

**Back of Figure 4-2**

**Figure 4-3**

**Structurally Deficient and Functionally Obsolete Bridge Locations**

**Back of Figure 4-3**

## **Consideration of Environmental Factors**

In recent years, environmental considerations associated with highway improvements or construction have come to the forefront of the planning process. The legislation that dictates the necessary procedures regarding environmental impacts is the National Environmental Policy Act. Section 102 of this act requires the execution of an environmental impact statement (EIS) for road projects that have a significant impact on the environment. An EIS includes an evaluation of a project's impact on wetlands, water quality, historic properties, wildlife and public lands.

Although the technical report for the thoroughfare plan is not intended to cover environmental concerns in as much detail as an EIS, preliminary research on environmental factors is generally done at the thoroughfare planning stage.

### Wetlands

In general terms, wetlands are lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The single feature that most wetlands share is soil or substrata that is at least periodically saturated with or covered by water. Water creates severe physiological problems for all plants and animals except those that are adapted for life in it or in saturated soil.

Wetlands are crucial ecosystems in our environment. They help regulate and maintain the hydrology of our rivers, lakes and streams by slowly storing and releasing floodwaters. They help maintain the quality of our water by storing nutrients, reducing sediment loads and reducing erosion. They are also critical to fish and wildlife populations. Wetlands provide an important habitat for about one third of the plant and animal species that are federally listed as threatened or endangered.

The impacts to wetlands can be evaluated using the National Wetlands Inventory Mapping, available from the U. S. Fish and Wildlife Service. Wetland impacts will be avoided or minimized to the greatest extent possible while preserving the integrity of the thoroughfare plan. Figure 4-4 shows the wetland locations in Catawba County.

### Threatened and Endangered Species

A preliminary review of Federally Listed Threatened and Endangered Species within Catawba County was done to determine the effect new corridors could have on wildlife. Threatened or endangered species were identified using mapping from the North Carolina Department of Environment, Health and Natural Resources.

The Threatened and Endangered Species Act of 1973 allows the U. S. Fish and Wildlife Service to impose measures for mitigation of the environmental impacts of a road project on endangered plants and animals and critical wildlife habitats. By locating rare species in the planning stage of road construction, avoidance or minimization of these impacts is possible.

Table 4-5 lists all threatened and endangered species in Catawba County. The locations are depicted on Figure 4-5 as national heritage sites. A detailed field investigation is recommended prior to construction of any highway project or roadway improvement.

**Table 4-5**

**Endangered Species, Threatened Species, Federal Species of Concern, and Candidate Species, Catawba County, North Carolina**

<b>Common Name</b>	<b>Scientific name</b>	<b>Federal Status</b>	<b>Record Status</b>
<b>Vertebrate:</b>			
<a href="#">Bald eagle</a>	<i>Haliaeetus leucocephalus</i>	T	Current
Southern Appalachian eastern woodrat	<i>Neotoma floridana haematoresia</i>	FSC	Current
<b>Invertebrate:</b>			
Catawba crayfish ostracod	<i>Dactylocythere isabelae</i>	FSC	Current
<b>Vascular Plant:</b>			
<a href="#">Dwarf-flowered heartleaf</a>	<i>Hexastylis naniflora</i>	T	Current
Sweet pinesap	<i>Monotropsis odorata</i>	FSC	Current
<b>Nonvascular plant:</b>			

**Lichen:**

**Definitions of Federal Status Codes:**

E = endangered. A taxon “in danger of extinction throughout all or a significant portion of its range.”

T = threatened. A taxon “likely to become endangered within the foreseeable future throughout all or a significant portion of its range.”

P = proposed. A taxon proposed for official listing as endangered or threatened.

C = candidate. A taxon under consideration for official listing for which there is sufficient information to support listing. (Formerly “C1” candidate species.)

FSC = federal species of concern. A species under consideration for listing, for which there is insufficient information to support listing at this time. These species may or may not be listed in the future, and many of these species were formerly recognized as “C2” candidate species.

T(S/A) = threatened due to similarity of appearance. 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.

EXP = experimental population. A taxon listed as experimental (either essential or nonessential). Experimental, nonessential populations of endangered species (e.g., red wolf) are treated as threatened species on public land, for consultation purposes, and as species proposed for listing on private land.

**Definitions of “Record Status” qualifiers:**

Current – the species has been observed in the county within the last 50 years.

Historic – the species was last observed in the county more than 50 years ago.

Obscure – the date and/or location of observation is uncertain.

Incidental/migrant – the species was observed outside of its normal range or habitat.

Probable/potential – the species is considered likely to occur in this county based on the proximity of known records (in adjacent counties), the presence of potentially suitable habitat, or both.

Historic Sites

The locations of historic sites in Catawba County were investigated to determine the possible impacts of the various projects studied. The federal government has issued guidelines requiring all state transportation departments to make special efforts to preserve historic sites. In addition, the State of North Carolina has issued its own guidelines for the preservation of historic sites. These two pieces of legislation are described below.

**National Historic Preservation Act** – Section 106 of this act requires state departments of transportation to identify historic properties listed in the National Register of Historic Places and properties eligible to be listed. State departments of transportation must consider the impacts of

**Figure 4-4**  
**Wetlands Locations**

**Back of Figure 4-4**

its road projects on these properties and consult with the Federal Advisory Council on Historic Preservation.

**NC General Statute 121-12(a)** – This statute requires the NCDOT to identify historic properties listed on the National Register, but not necessarily those eligible to be listed. NCDOT must consider impacts and consult with the North Carolina Historical Commission, but is not bound by their recommendations.

Table 4-6 lists all Historic Sites in Catawba County. The location of these Sites is depicted in Figure 4-6. All reasonable efforts will be made to minimize the impact to identified historic sites and natural settings when widening existing roadways or constructing new facilities. Care should be taken to make certain that all historic sites and natural settings are preserved. Therefore, a more detailed study should be done in regard to local historic sites prior to construction of any project.

**Table 4-6**  
**Historic Sites in Catawba County \***

<b>Name</b>	<b>Location</b>
<b>Anthony, Abraham, Farm</b> (added 1990 – <b>District</b> - #90000738)	W side of SR 1008, 0.5 mi. S of jct. With SR 2021, Blackburn
<b>Baker Farm</b> (added 1990 – <b>District</b> - #90000857)	NC 127 N of jct. With SR 1132, Baker Mountain
<b>Balls Creek Campground</b> (added 1990 – <b>District</b> - #90000662)	W side of SR 1003, 0.1 mi. S of SR 1943, Bandy’s Crossroads
<b>Bandy Farms Historic District</b> (added 1990 – <b>District</b> - #90000663)	E side of SR 1003, 0.5-0.85 mi. S of SR 1813 jct., Bandy’s Crossroads
<b>Bolick Historic District</b> (added 1990 – <b>District</b> - #90001032)	First Ave. S. between US 64/70 and 12 <sup>th</sup> St., Conover
<b>Bost—Burris House</b> (added 1990 – <b>Building</b> - #90001033)	Jct. Of SR 1149 and SR 1154, Newton
<b>Bunker Hill Covered Bridge **</b> (added 1970 – <b>Structure</b> - #70000446)	2 mi. E of Claremont on U.S. 70, Claremont
<b>Catawba County Courthouse **</b> (added 1979 – <b>Building</b> - #79001690)	S. Main, W.A, S. College, and W. 1 <sup>st</sup> Sts., Newton
<b>Catawba Historic District</b> (added 1986 – <b>District</b> - #86000893)	Roughly bounded by Second Ave. NE, Third and Second Sts. SE, Second Ave. SW and NC 10, and Second St. SW, Catawba
<b>Claremont High School Historic District</b> (added 1986 – <b>District</b> - #86003357)	Roughly bounded by Fifth and Third Aves., Third St., Second Ave. and N. Center St., Hickory

<b>Elliott-Carnegie Library</b> (added 1985 – <b>Building</b> - #85000584)	415 – 1 <sup>st</sup> Ave. NW, Hickory
<b>First Presbyterian Church</b> (added 1985 – <b>Building</b> - #85000585)	2 <sup>nd</sup> St. and 3 <sup>rd</sup> Ave. NW, Hickory
<b>Foil—Cline House</b> (added 1990 – <b>Building</b> - #90001034)	406 S. Main Ave., Newton
<b>Geitner, Clement, House</b> (added 1985 – <b>Building</b> - #85000703)	436 Main Ave. NW, Hickory
<b>Grace Reformed Church</b> (added 1990 – <b>Building</b> - #90001035)	201—211 S. Main Ave., Newton
<b>Grace Union Church and Cemetery District</b> (added 1990 – <b>District</b> - #90000739)	Jct. Of SR 1008 and SR 2030, Blackburn
<b>Hickory Municipal Building</b> (added 2000 – <b>Building</b> - #00000119)	30 Third St., SW, Hickory
<b>Highland School</b> (added 1990 – <b>Building</b> - #90000824)	1017 10 <sup>th</sup> Ave. NE., Hickory
<b>Houck’s Chapel</b> (added 1985 – <b>Building</b> - #85000587)	9 <sup>th</sup> Ave. and 17 <sup>th</sup> St. NW, Hickory
<b>Huffman, George, Farm</b> (added 1990 – <b>District</b> - #90000861)	SR 1479, SE of jct. With Tate Blvd., Conover
<b>Keever—Cansler Farm</b> (added 1990 – <b>District</b> - #90000740)	E side of SR 2024, 0.05 mi. N of jct. With SR 2026, Blackburn
<b>Kenworth Historic District</b> (added 1985 – <b>District</b> - #85001054)	Roughly bounded by 2 <sup>nd</sup> Ave., 5 <sup>th</sup> St. and 3 <sup>rd</sup> Ave. Dr. SE, Hickory
<b>Lentz, John A., House</b> (added 1985 – <b>Building</b> - #85000588)	321 9 <sup>th</sup> St. NW, Hickory
<b>Long, McCorkle and Murray Houses</b> (added 1990 – <b>District</b> - #90001371)	1310—1326 N. Main Ave., Newton
<b>Memorial Reformed Church</b> (added 1990 – <b>Building</b> - #90000865)	201 E. Main St., Maiden
<b>Miller—Cansler House</b> (added 1990 – <b>Building</b> - #90000741)	N side of SR 2007, 0.5 mi. E of jct. With SR 1005, Maiden
<b>Moore, Alexander, Farm</b> (added 1990 – <b>District</b> - #90000664)	SR 2646 0.5 mi. NW of SR 1004 jct., Catawba
<b>Moretz, John Alfred, House</b> (added 1985 – <b>Building</b> - #85000589)	1437 – 6 <sup>th</sup> St. Circle NW, Hickory

<b>Munday House</b> ** (added 1975 – <b>Building</b> - #75001246)	Address Restricted, Denver
<b>Murray’s Mill Historic District</b> (added 1979 – <b>District</b> - #79001689)	SE of Catawba, Catawba
<b>Neill—Turner—Lester House</b> (added 1990 – <b>Building</b> - #90000742)	N side of SR 1836, 0.25 mi. NE of jct. With SR 1837, Sherrills Ford
<b>North Main Avenue Historic District</b> (added 1986 – <b>District</b> - #86001147)	Roughly bounded by W. Ninth St., N. Main Ave., W. Fourth and W. Sixth Sts., N. Deal Ave., and W. Eighth St., Newton
<b>Oakwood Historic District</b> (added 1986 – <b>District</b> - #86000687)	Roughly bounded by Oakwood Cemetery and Fourth Ave. NW, Fourth St. NW, Second Ave. NW, and Sixth St. NW, Hickory
<b>Perkins House</b> (added 1974 – <b>Building</b> - #74001336)	N of Catawba off I-40, Newton
<b>Piedmont Wagon Company</b> (added 1985 – <b>Building</b> - #85000592)	Main Ave. NW, Hickory
<b>Powell-Trollinger Lime Kilns</b> ** (added 1974 – <b>Structure</b> - #74001337)	S of Catawba, Catawba
<b>Propst House</b> (added 1973 – <b>Building</b> - #73001312)	Shuford Memorial Garden, Hickory
<b>Propst, David F., House</b> (added 1990 – <b>Building</b> - #90000864)	Jct. Of SR 1810 and SR 1878, Maiden
<b>Reinhardt, Franklin D., and Harren-Hood Farms</b> (added 1990 – <b>District</b> - #90000863)	SR 2013 NW of jct. With SR 2012, Maiden
<b>Reinhardt, William Pinckney, House</b> (added 1990 – <b>Building</b> - #90001111)	Jct. Of SR 2012 and SR 2013, Maiden
<b>Rock Barn Farm</b> (added 1990 – <b>Building</b> - #90001036) Also known as <b>Hoke—Roseman Farm</b>	W side of SR 1709, .4 mi. N of jct. With SR 1715, Claremont
<b>Rudisill-Wilson House</b> (added 1973 – <b>Building</b> - #73001315)	
<b>Second Street Place Southwest Historic District</b> (added 1986 – <b>District</b> - #85001790)	Roughly bounded by Main Ave. Pl., Second Ave. Pl. and First Ave. SW, Hickory
<b>Self—Trott—Bickett House</b> (added 1990 – <b>Building</b> - #90001037)	331 S. College Ave., Newton
<b>Sharpe—Gentry Farm</b> (added 1990 – <b>District</b> - #90000859) Also known as <b>Sharpe,John O.,Farm</b>	Jct. Of NC 10 and SR 1137, Propst Crossroads

<b>Sherrill, Miles Alexander, House</b> (added 1990 – <b>Building</b> - #90000665)	W side of SR 1849, 0.1 mi. S of SR 1848 jct., Sherrills Ford
<b>Shuford House</b> (added 1973 – <b>Building</b> - #73001313)	542 2 <sup>nd</sup> St. NE., Hickory
<b>Shuford—Hoover House</b> (added 1990 – <b>Building</b> - #90000743)	E side of SR 1008, 0.05 mi. S of jct. With SR 10, Blackburn
<b>St. Paul’s Church and Cemetery</b> ** (added 1971 – <b>Building</b> - #71000573)	Jct. Of SR 1149 and SR 1164, Newton
<b>St. Paul’s Reformed Church</b> (added 1990 – <b>Building</b> - #90000860)	Jct. Of SR 1151 and SR 1005, Startown
<b>Terrell Historic District</b> (added 1986 – <b>District</b> - #86001685)	NC 150 and SR 1848, Terrell
<b>Warlick—Huffman Farm</b> (added 1990 – <b>District</b> - #90000862)	SR 1116 NW of jct. With NC 10, Propst Crossroads
<b>Weidner Rock House</b> (added 1973 – <b>Building</b> - #73001314)	S of Hickory on SR 1142, Hickory
<b>Wesley’s Chapel Arbor and Cemetery</b> (added 1990 – <b>District</b> - #90000744)	W side of SR 2033, 0.4 mi. S of jct. With SR 10, Blackburn
<b>Wilfong—Wilson Farm</b> (added 1990 – <b>District</b> - #90000858)	SR 1145, SW of jct. With SR 1146, Startown
<b>Yoder’s Mills Historic District</b> ** (added 1980 – <b>District</b> - #80002806)	Address Restricted, Hickory

\* From National Register of Historic Place

## **5. Implementation of the Thoroughfare Plan**

Once the thoroughfare plan has been developed and adopted, implementation is one of the most important aspects of the transportation plan. Unless implementation is an integral part of this process, the effort and expense associated with developing the plan will be lost. There are several tools available for use by the County to assist in the implementation of the thoroughfare plan. They are described in detail in this chapter.

### **State-County Adoption of the Thoroughfare Plan**

Catawba County and the North Carolina Department of Transportation (NCDOT) have mutually approved the thoroughfare plan shown in Figure 1-1. The mutually adopted plan now serves as a guide for the NCDOT in the development of the transportation system for the county. The approval of this plan by the County also enables standard road regulations and land use controls to be used effectively in the implementation of this plan.

### **Subdivision Controls**

Subdivision regulations require every subdivider to submit to the County Subdivision Review Board a plan of any proposed subdivision. It also requires that subdivisions be constructed to meet certain standards. Through this process, it is possible to require the subdivision streets to conform to the thoroughfare plan and to reserve or protect necessary right-of-way for proposed roads. The construction of subdivision streets to adequate standards reduces maintenance costs and simplifies the transfer of streets to the State Highway System. Appendix D outlines the recommended subdivision design standards as they pertain to road construction.

### **Land Use Controls**

Land use regulations are an important tool in that they regulate future land development and minimize undesirable development along roadways. The land use regulatory system can improve highway safety by requiring sufficient setbacks to provide for adequate sight distances and by requiring off-street parking.

### **Development Reviews**

The District Engineer's office and the Traffic Engineering Branch of NCDOT review driveway access to any state-maintained road. In addition, any development expected to generate large volumes of traffic (e.g., shopping centers, fast food restaurants, or large industries) should be comprehensively studied by the Traffic Engineering Branch, the Project Development and Environmental Analysis Branch, and/or the Roadway Design Unit of NCDOT. If reviewed at an early stage, it is often possible to significantly improve the development's accessibility while preserving the integrity of the thoroughfare plan.

## **Funding Sources**

### County Construction Account

The County Construction Account is used to allocate funding to pave unimproved roads, widen roadways, stabilize dirt roads, make minor alignment improvements, and even construct short connectors when appropriate. These improvements are implemented on a priority basis that is developed through the NCDOT Division Offices. The appropriate Division Engineer's Office should be contacted for more information on the County Construction Account. The office address for Division Twelve, which includes Catawba County, is given below. For more specific contact information for the division office or any other NCDOT personnel, the Customer Service Office can be contacted toll free at 1-877-DOT-4YOU or by visiting the website at [www.dot.state.nc.us](http://www.dot.state.nc.us).

Division Engineer's Office (Division 12)  
N.C. Department of Transportation  
1710 E. Marion St. (US 74 Business)  
Shelby, 28151-0047  
(704) 480-9020

### Transportation Improvement Program

North Carolina's Transportation Improvement Program (TIP) is a document that lists all major transportation projects, and their funding sources, planned by the NCDOT for a seven-year period. Every two years, when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added. In addition to highway construction and widening, TIP funds are available for bridge replacement, highway safety projects, enhancement projects, environmental mitigation, railroad crossings, bicycle facilities, and public transportation.

During biannual TIP public hearings, municipalities, local citizens groups, and other interested parties request projects to be included in the TIP. The group requesting a particular project(s) should submit to the NCDOT Board of Transportation Member from the county's respective division the following: a letter with a prioritized summary of requested projects, TIP candidate project request forms, and project location maps with a description of each project. Refer to Appendix F for an example of a TIP project request packet. The Board of Transportation reviews all of the project requests from each area of the state. Based on the technical feasibility, need, and available funding, the board decides which projects will be included in the TIP.

### Industrial Access Funds

If certain economic conditions are met, Industrial Access Funds are available for construction of access roads for industries that plan to develop property that does not have access to any state-maintained road. The NCDOT Secondary Roads Office should be contacted for information on Industrial Access Funds.

### Small Urban Funds

Small Urban Funds are annual discretionary funds that are distributed to municipalities for qualifying projects. A given municipality may receive funding for multiple projects, but there is a maximum of one million dollars per year per division. Requests for Small Urban Fund assistance should be directed to the Division Engineer.

### The North Carolina Highway Trust Fund Law

The Highway Trust Fund Law was established in 1989 as a plan with four major goals for North Carolina's roads and highways. These goals are:

1. To complete the remaining 1,716 miles of four lane construction on the 3,600 mile North Carolina Intrastate System.
2. To construct a multilane connector in Asheville and portions of multilane loops in Charlotte, Durham, Greensboro, Raleigh, Wilmington, and Winston-Salem.
3. To supplement the secondary roads appropriation in order to pave, by 1999, 10,000 miles of unpaved secondary roads carrying 50 or more vehicles per day, and all other unpaved secondary roads by 2006.
4. To supplement the Powell Bill Program.

A portion of this bill, which will benefit Catawba County over the thirty-year planning period, is the paving of most, if not all, of its unpaved roads on the state-maintained system. The Program Development Branch of NCDOT should be contacted for information on the Highway Trust Fund Law.

### **Implementation Recommendations**

The following table gives recommendations for the most suitable funding sources and methods of implementation for the major project proposals of the Catawba County Thoroughfare Plan.

**Table 5-1**

<b>Funding Sources and Recommended Methods of Implementation</b>								
<b>Projects</b>	<b>Funding Sources</b>				<b>Methods of Implementation</b>			
	Local Funds	TIP Funds	Indust. Access	Small Urban	T-fare Plan	Subdiv. Ord.	Zoning Ord.	Develop. Review
NC 16 (New Location) (TIP #R-2206)		X			X		X	X
NC 16 Widening (TIP # 3100)		X			X		X	X
NC 150 Widening (TIP #R-2307)		X			X		X	X
NC 127 Widening		X			X		X	X
Robinson Rd Extension		X			X	X	X	X