NCDOT TPB
TRANSPORTATION PLANNING BRANCH

Transportation Plan for

Yadkin County

Yadkin County Transportation Plan Technical Report

Prepared by the:

Transportation Planning Branch
North Carolina Department of Transportation

In Cooperation with:

Yadkin County
Northwest Piedmont Rural Planning Organization
The Federal Highway Administration
U.S. Department of Transportation

July, 2005

Scott Walston, P.E.

Acknowledgements

Persons responsible for this report:

Transportation Planning Engineer:	Adam Snipes, EIT
Triangle Planning Unit Head:	Scott Walston, PE
Western Planning Group Manager:	Dan Thomas, PE
Transportation Planning Branch Manager:	Mike Bruff, PE
Engineering Technician:	Jim Neely

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

Introduction

1

An area's transportation system is its lifeline, contributing to its economic prosperity and social well being. The importance of a safe and efficient transportation infrastructure cannot be overstressed. This system provides a means of transporting people and goods from one place to another quickly, conveniently, and safely. A well-planned system will meet the existing travel demands, as well as keep pace with the growth of the region.

Officials of Yadkin County, with assistance from the Northwest Piedmont Rural Planning Organization (RPO), requested that the North Carolina Department of Transportation (NCDOT) Transportation Planning Branch cooperatively develop a Comprehensive Transportation Plan for Yadkin County.

Yadkin County is located in the northwestern part of North Carolina. The geographical location of the county is shown in **Figure 1**.

This report documents the development of the 2004 Yadkin County Comprehensive Transportation Plan (CTP) shown in **Figure 2.** In addition, this report presents recommendations for each mode of transportation.

A comprehensive transportation plan is developed to ensure that the transportation system will be progressively developed, meeting the needs of the county. It will serve as an official guide to providing a well-coordinated, efficient, and economical transportation system utilizing all modes of transportation. This document will be utilized by local officials to ensure that planned transportation facilities reflect the needs of the public, while minimizing the disruption to local residents, businesses, and the environment.

The purpose of this study is to examine present and future transportation needs of the county and develop a Comprehensive Transportation Plan to meet these needs. The

Valuable Information
Term Definitions
More Information on Web
Document Reference

Acronyms

NCDOT – North Carolina Department of Transportation

RPO – Rural Planning Organization

CTP

CTP stands for Comprehensive Transportation Plan. This new format replaces the thoroughfare plan as the official document mutually adopted by the local areas (municipality, MPO, or county) and the Department of Transportation.

plan recommends those improvements that are necessary to provide an efficient transportation system within the 2004-2030 planning period.

Initiative for the implementation of the Transportation Plan rests predominately with the policy boards and citizens of the county. Yadkin County and the North Carolina Department of Transportation share the responsibility for any proposed construction. The needs throughout the state exceed available funding; therefore, it is imperative that the county aggressively pursues funding for desired projects.

The proposed Transportation Plan is based on the projected growth for the county as coordinated with the county officials. It is possible that actual growth patterns will differ from those logically anticipated. As a result, it may be necessary to accelerate or delay the development of some recommendations found on the plan. Some portions of the plan may require revisions in order to accommodate unexpected changes in urban development. The best use of this plan is to make sure that any changes made to one element of the transportation plan are consistent with the other elements.

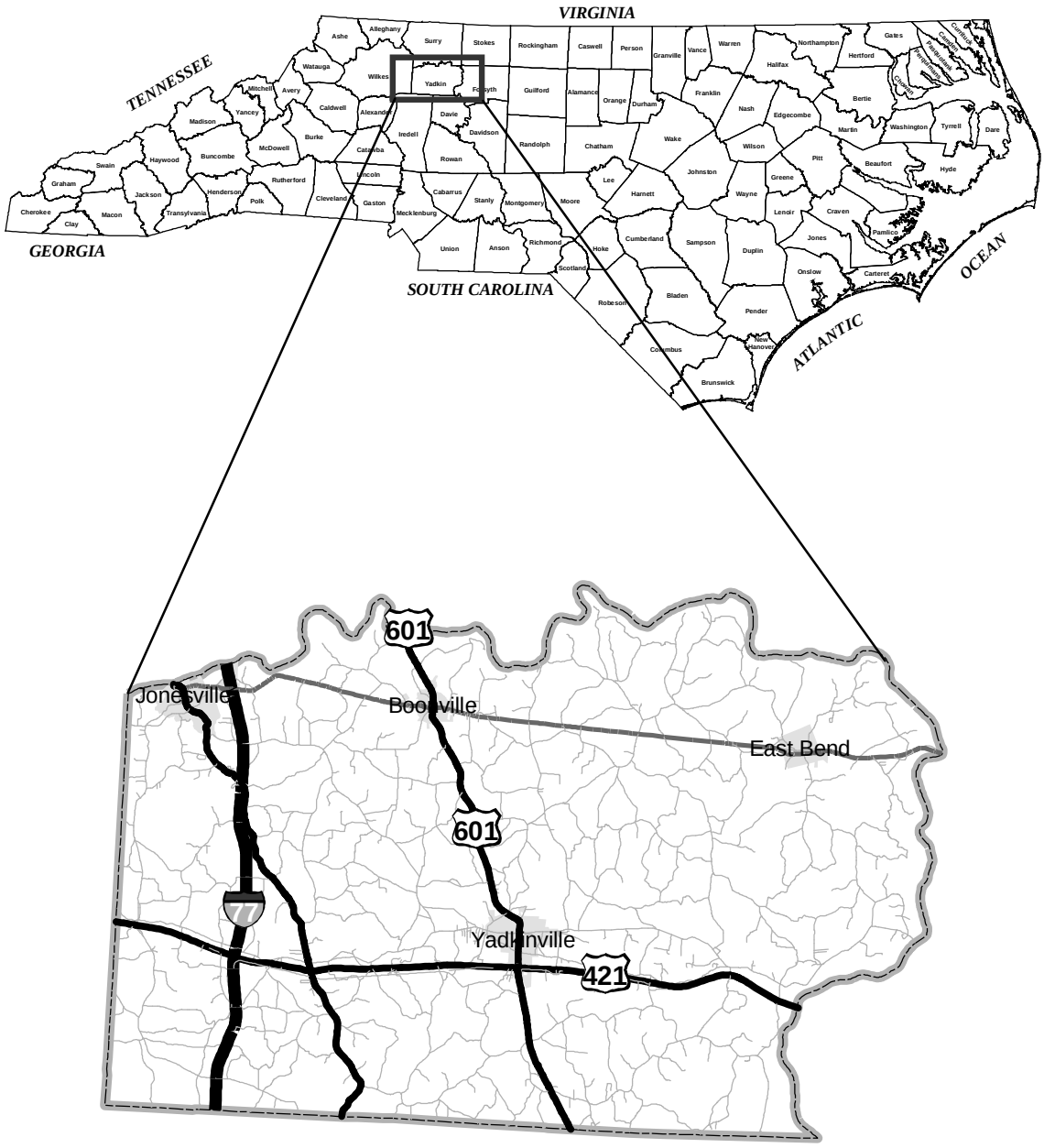


FIGURE 1

GEOGRAPHIC LOCATION

YADKIN COUNTY

NORTH CAROLINA

PREPARED BY:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING BRANCH

IN COOPERATION WITH:

FEDERAL HIGHWAY ADMINISTRATION
NORTHWEST PIEDMONT RPO
YADKIN COUNTY

BASE MAP DATE: June 2003

Adopted by:

Yadkin County
Date: August 16, 2004

NCDOT
Date: February 3, 2005

Endorsed by:

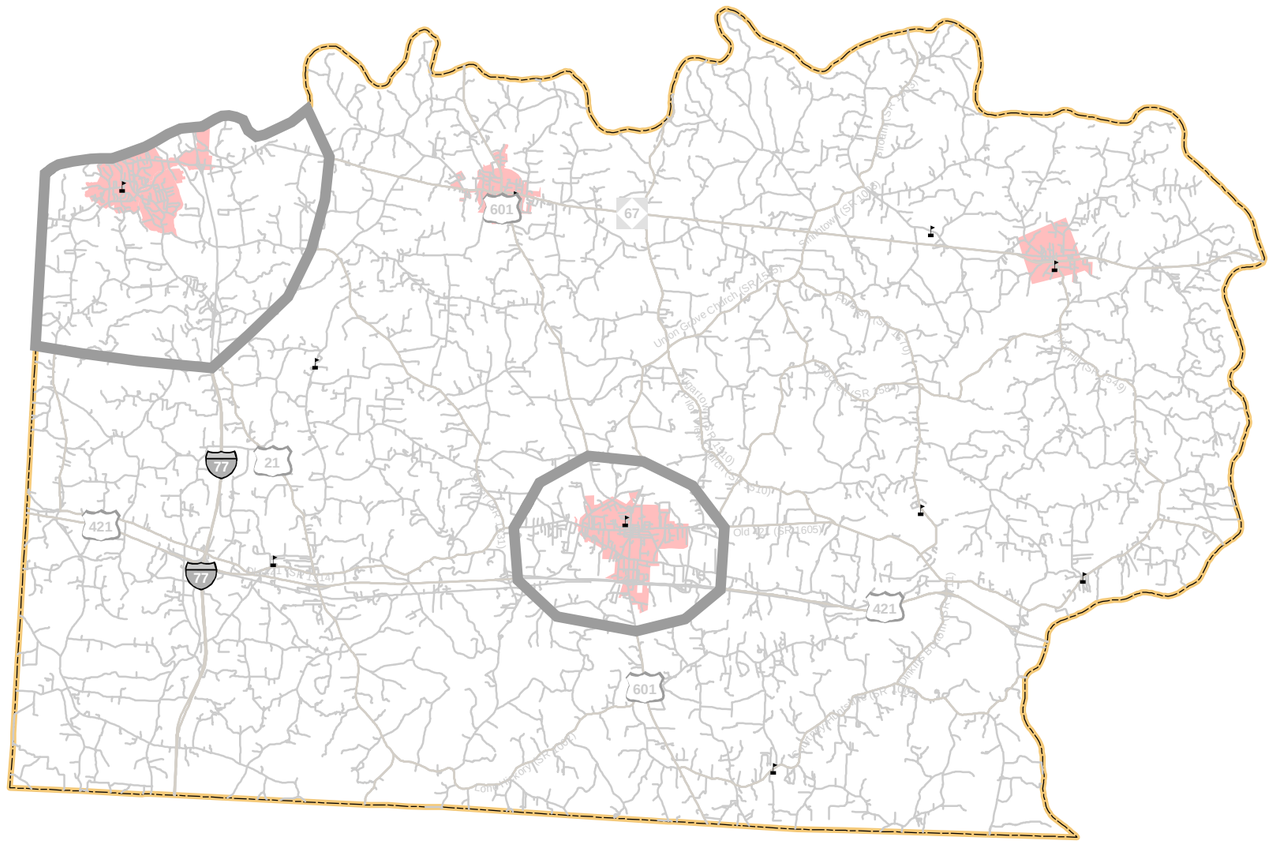
Northwest Piedmont RPO
Date: November 16, 2004

Recommended by:

Transportation Planning Branch
Date: January 12, 2005

NOTES:

Sheet 3 Not-included, no Public Transportation or Rail in Yadkin County.
Format for Sheet 5 Pedestrian map is pending.



Adoption Sheet

Yadkin County, North Carolina

Comprehensive Transportation Plan

Plan date: August 12, 2004

Legend

- Schools
- Roads
- Rivers and Streams
- City Boundary
- Planning Area Boundaries
- County Boundary

0 0.5 1 2 3 Miles

Sheet 1 of 5

Base map date: June, 2003

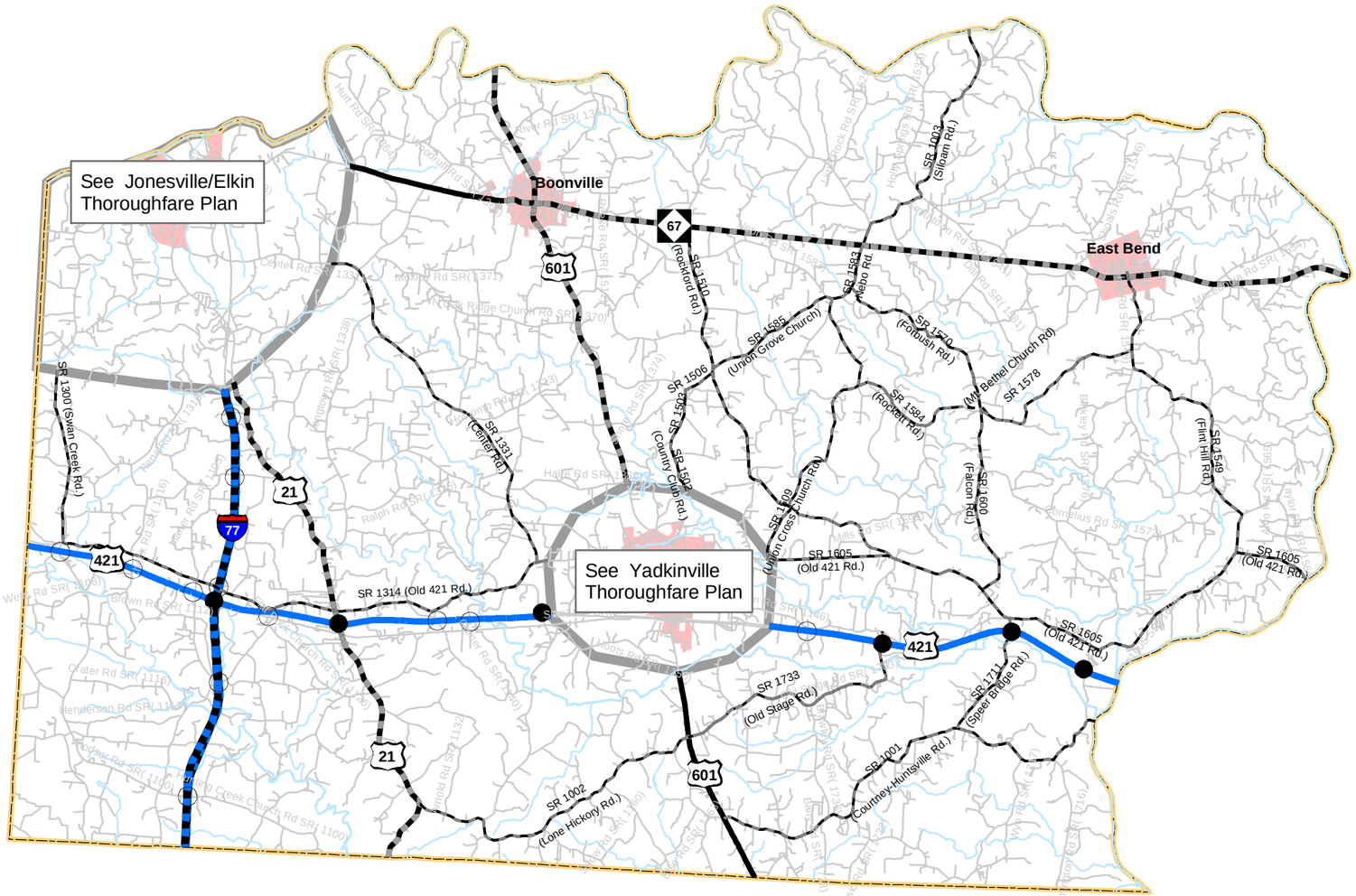
Refer to CTP document for more details

Figure 2, Sheet 1

Highway Map

Yadkin County, North Carolina Comprehensive Transportation Plan

Plan date: August 12, 2004



Freeways
- Existing
- Needs Improvement
- Recommended

Expressways
- Existing
- Needs Improvement
- Recommended

Boulevards
- Existing
- Needs Improvement
- Recommended

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended

- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation

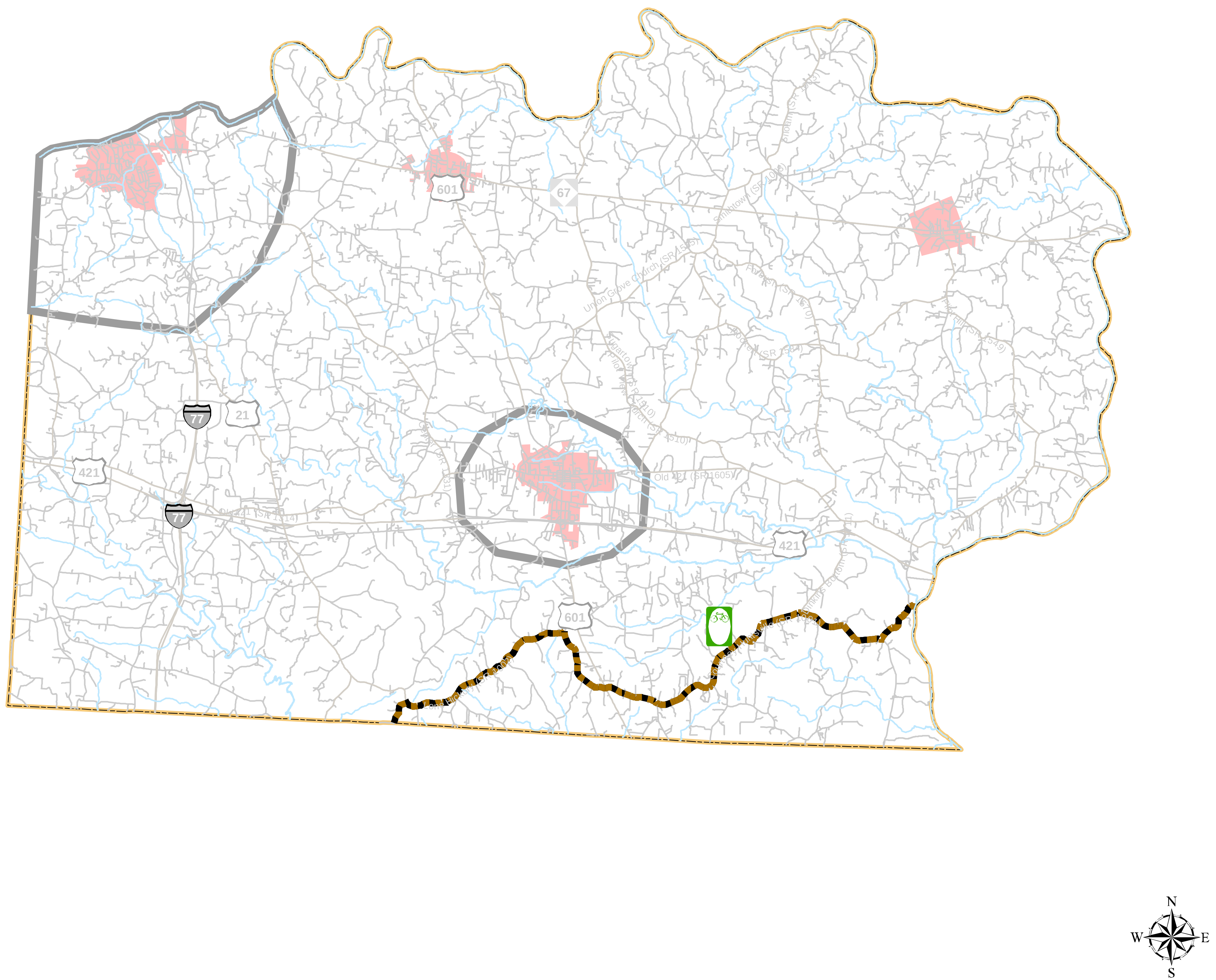
Miles
0 0.5 1 2 3

Sheet 2 of 5

Base map date: June, 2003

Refer to CTP document for more details

Figure 2, Sheet 2



Bicycle Map

Yadkin County

Comprehensive Transportation Plan

Plan date: August 12, 2004

On Road
- Existing
- Needs Improvement
- Recommended

Off Road
- Existing
- Needs Improvement
- Recommended

*Part of North Carolina Bicycle Route #2
"Mountains to the Sea"

Miles: 0 0.5 1 2 3

Sheet 4 of 5

Base map date: June, 2003

Refer to document for more details

Figure 2, Sheet 4

Recommendations

2

This chapter contains recommended improvements based on the ability of the existing system to serve existing and anticipated travel desires as the area continues to grow. The recommended plan represents a system of transportation elements including highways and bicycle facilities, which will serve the anticipated traffic and land development needs for the county. The primary objective of this plan is to reduce traffic congestion and improve safety by eliminating both existing and projected deficiencies in the transportation system.

2.1 Highway Map

The recommended highway element of the comprehensive transportation plan (CTP) for the county is presented on **Figure 2, Sheet 2.** This plan includes roadways within the county that fall into five categories: freeways, expressways, boulevards, other major thoroughfares, and minor thoroughfares. See **Appendix B** for a more detailed description of each category and **Appendix C** for a highway inventory of the recommendations.

Capacity

The number of vehicles that can pass a given point during a specified period under prevailing roadway, traffic, and control conditions. This assumes that there is no influence from downstream traffic operation, such as a backing up of traffic into the analysis point. *(Highway Capacity Manual, 2000)*

The process of determining and evaluating recommendations for those roads in the transportation plan involves many considerations including the goals and objectives of the public in the area, existing roadway properties, identified roadway capacity deficiencies, environmental impacts and existing and anticipated land development. Consideration of these factors led to the cooperative development of several recommended improvements. A description of each recommendation is given below.

2.2 Primary Route Improvements

I-77 Upgrades

- **Project Recommendation:** It is recommended that I-77 be upgraded from a four-lane freeway to a six-lane freeway throughout Yadkin County. The total cost of this project, including construction and right of way, from the Iredell County line to the Surry County line is $49,428,000.
- **Transportation Demand:** The construction of this project is needed to improve north-south highway transportation from Cleveland, Ohio to Columbia, South Carolina. Besides being important on a regional level, I-77 provides citizens of Yadkin County access to Virginia, South Carolina, and the Charlotte Metropolitan area. The traffic on I-77 is expected to increase to 46,900 vehicles per day (vpd) in the southern part of the county and 59,000 vpd in the north.
- **Capacity:** The average annual daily traffic (AADT) for all studied corridors was based on the 2002 AADT volumes. Based on historical AADT records, traffic volumes were projected for the future planning year of 2030. The projected average daily traffic volumes along I-77 range from 46,900 vpd to 59,000 vpd. Based on these projected volumes, there would be capacity deficiencies in the northern part of Yadkin County where traffic volumes are higher. This increase in volume is larger due to traffic coming from US 421 and heading north on I-77. The recommended improvement to six lanes will increase the capacity to maintain an adequate level of service for 2030, and beyond.
- **Safety Issues:** The interchange of I-77 with US 421 is listed among the high collision locations within Yadkin County. If no improvements are made to I-77, the resulting increase in congestion will result in the potential for increased collision rates due to high numbers and close proximity of vehicles in the traffic stream. The recommended improvements to I-77 will provide increased capacity, and greater maneuverability, resulting in safer driving conditions.
- **Social Demands/ Economic Development:** This project will improve interstate travel and access from the north-central states of the Unites States (Michigan, Ohio, etc.) to the southeastern coast of the United States ending in the South Carolina. Improved access to North Carolina should have a positive impact on economic development, and improve automobile transportation.
- **System Linkage:** I-77 is already a part of the nationwide Eisenhower Interstate System. By using I-77 residents of Yadkin County can access cities, such as: Charleston, WV, Cleveland and Akron, Ohio, Charlotte, NC, and Columbia, SC.

- **Relationships to Other Plans:** The recommendation to upgrade I-77 was first included in the 1993 Iredell County Thoroughfare Plan, where traffic volumes were projected to reach 80,800 vpd by 2015. This upgrade was also recommended in the 1997 Statesville Thoroughfare Plan. The 1992 Thoroughfare Plan for the Elkin-Jonesville-Arlington area made no recommendations for improving I-77. The recommendation to upgrade I-77 in Yadkin County is not included in the 2004-2010 Transportation Improvement Program.
- **Modal Relationships:** The proposed improvements to I-77 have been coordinated with the Bicycle Element of the Yadkin County Comprehensive Transportation Plan. No impacts are anticipated to the bicycle recommendations as a result of the I-77 improvements.

US 21

As the incident management detour route for I-77, US 21 could be heavily burdened in the event of an unexpected detour of traffic off I-77. US 21 also provides a north-south connection for local traffic and for travelers between areas such as Elkin and Statesville. At present this road has deficient lane-widths for the volume that it normally carries (3500 vpd) and is ill prepared for higher volumes if a large amount of traffic is diverted from I-77. To improve safety and capacity it is recommended that US 21 be improved to 12-foot lanes, 2 foot paved shoulders, and median turn-lanes at key intersections. This recommendation is not included in the 2004-2010 Transportation Improvement Program (TIP).

Acronyms

TIP – Transportation Improvement Program

US 601 (Davie County to Southern Yadkinville Planning Boundary)

- **Current Projects:** TIP Project R-3427 is scheduled for construction in Fiscal Year 2005. This project will widen the lanes to 12 feet, install turn lanes, and install a traffic signal at the intersection of US 601 and SR 1001(Courtney-Huntsville Rd.).

More Information on Web

More information about the NCDOT's Transportation Improvement Program and project R-3427 is available at: http://www.ncdot.org/planning/development/TIP/

Figure 3: Example of Proposed Improvements to US 601

US 601 (Northern Yadkinville Planning Boundary to Surry County)

- **Project Recommendation**: It is recommended that the following improvements be made to US 601 from the northern Yadkinville Planning Boundary, north to the Surry County line:
    - Widen travel lanes to 12 feet, and add a 2 foot paved shoulder.
    - Install turn lanes at key intersections
    - Install passing lanes on sections of roadway where there are few existing opportunities to pass.
- **Transportation Demand:** US 601 serves as a primary north-south connector route within Yadkin County, providing access to the municipalities of Yadkinville and Boonville, and to Davie and Surry Counties.
- **Capacity**: Currently US 601 is a two-lane facility, providing capacity levels from 6000 to 9600 vpd. The 2002 AADT volumes range from 3700 to 6100 vpd and the 2030 volumes range from 7300 to 9800 vpd. Without improvement, the current capacity would not be adequate to carry the projected average daily volumes on all locations of US 601.
- **Safety Issues:** This section of US 601 is located in rolling terrain and contains long stretches of highway where there are few passing opportunities. Combined with the volume of trucks and other slow-moving

vehicles, the lack of passing opportunities leads to congestion and increases the risk of collisions. The addition of passing lanes and turn lanes at major intersections will help to increase capacity, maneuverability, and increase travel speed while offering safer driving conditions.

- **Social Demands and Economic Development:** As identified in the Yadkin County Land Use Plan, the US 601 corridor is expected to be a focal point of development in the future. The recommended improvements to US 601, in addition to accommodating the expected traffic increase, may also help to spur additional economic development in this area. Economic development in any portion of the county will increase the tax base, which can be used to improve public services throughout the county, thereby inducing other industries to locate in the county.
- **System Linkage:** Improving the operational efficiency and safety of US 601 is imperative because of its significance in serving intracounty travel, providing a connection between Yadkinville and Boonville, and providing access to Davie and Surry Counties.
- **Relationship to Other Plans:** The improvements for US 601 for this section of roadway correspond with the improvements recommended by the 2002 Surry County Thoroughfare Plan. The plan identified the need to widen the travel lanes on US 601 to 12 feet from the Yadkin County line to NC 268. This recommendation is not part of the 2004-2010 Transportation Improvement Program.

NC 67

NC 67 serves as a primary east-west connector across northern Yadkin County, joining the Elkin-Jonesville area to Boonville to East Bend and continuing on to Forsyth County and Winston-Salem. Currently TIP project R-3415 is in progress, and involves widening the lanes on NC 67 to 12 feet, adding a paved shoulder, and installing turn-lanes from SR 1355 (Messick Road) near Jonesville to US 601 in Boonville. Due to the high truck volumes on this facility, the current lack of paved shoulder, and narrow lanes, this project should be extended to the full length of NC 67 in the county.

The section of NC 67 that connects East Bend to Forsyth County will be carrying projected volumes around 11,000 vehicles per day in the future year of 2030. Coordination with the transportation plans of Forsyth County/Winston-Salem should be considered in future updates to assure that recommendations for NC 67 are consistent. The current Winston-Salem Thoroughfare Plan does not call for the future widening of NC 67, and at this time the projected volumes do not merit the additional lanes in Yadkin County. As travel demand increases, the addition of passing lanes between East Bend and Boonville should be studied.

2.3 Other Recommendations

Widening Projects

The following facilities have been identified as having travel lanes less than 12-feet wide. As travel volumes on these roadways increase, the need may arise to widen these facilities to include lane widths of 12 feet.

- SR 1001 (Courtney-Huntsville Rd.)
- SR 1002 (Lone Hickory Rd.)
- SR 1300 (Swan Creek Rd.)
- SR 1314 (Old 421 Rd.)
- SR 1331 (Center Rd.)
- SR 1502/1503 (Country Club Rd.)
- SR 1509 (Union Cross Church Rd.)
- SR 1510 (Rockford Rd./ Sugartown Rd.)
- SR 1549 (Flint Hill Rd.)
- SR 1570 (Nebo Rd/ Forbush Rd.)
- SR 1579 (Mt. Bethel Church Rd.)
- SR 1583 (Nebo Rd.)
- SR 1595 (Union Cross Church Rd.)
- SR 1600 (Falcon Rd.)
- SR 1605 (Old 421 Rd.)
- SR 1711 (Speer Bridge Rd.)
- SR 1733 (Old Stage Rd.)

Prior to any roadway improvements to roads that are a part of State Bicycle Route #2, the NCDOT Division of Bicycle and Pedestrian Transportation should be consulted on the most appropriate cross-section.
Roads that are part of State Bicycle Route #2 (Mountains to the Sea) seen in **Figure 2, Sheet 4**:

- SR 1001 (Courtney-Huntsville Rd.)
- SR 1002 (Lone Hickory Rd.)
- SR 1165 (Fish Brandon Rd.)

These routes should be widened to two 12-foot lanes, and considered for additional improvements as recommended by the Division of Bicycle and Pedestrian Transportation.

2.4 Intersection Improvements

The following intersections are recommended for improvements related to increasing mobility and continuity within Yadkin County. None of these intersections were identified as high-collision locations.

- **NC 67 and SR 1541 (Smithtown Road)/ SR 1645 (Pride's Road)**
  Realign roadways at the intersection of SR 1541 (Smithtown Rd.)/SR 1645 (Pride's Road) and NC 67 to eliminate the offsetting intersection condition. This improvement will form a single intersection with continuous through movement. Additionally, SR 1541 (Smithtown Rd.)/ SR 1645 (Pride's Rd.) should be realigned to improve horizontal deficiencies and increase sight distances. These improvements will provide increased visibility and greater maneuverability, resulting in safer driving conditions.
- **SR 1003 (Siloam Rd.), SR 1541 (Smithtown Road)/ SR 1533 (Holly Springs Road)**
  Currently these roads intersect in two offset T-intersections (3-legged intersections). These intersections should be realigned to make SR 1003 (Siloam Rd.) the through route at both intersections. SR 1003 (Siloam Rd.) provides a link across the Yadkin River to Surry County and provides a route to Yadkinville by connecting with SR 1570 (Nebo Rd.) at NC 67. These improvements will provide a more direct route from Yadkinville to Surry County by improving maneuverability and a more continuous route.

- A continuous route can be created from Yadkinville to Surry County by altering the configuration of intersections along a combination of SR routes. The following routes can be connected, and when joined together, provide a link from Yadkinville to the intersection of SR 1003 (Siloam Rd.) and NC 67. The following improvements should be made along this route:
  - Realign the intersection of SR 1503 (Country Club Rd.) and SR 1506 (Rockford Rd.) to make the connection between SR 1503 (Country Club Rd.) and SR 1506 (Rockford Rd.) and the continuous traffic movement instead of SR 1503 (Country Club Rd.).
  - Realign the intersection of SR 1506 (Rockford Rd.)/ SR 1585 (Union Grove Church Rd.) and SR 1510 (Sugartown Rd.) to make SR 1506 (Rockford Rd.)/SR 1585 (Union Grove Church Rd.) the through movement.
- In order to improve commuter travel between East Bend and Yadkinville, the intersections of SR 1584 (Rockett Rd.) and SR 1579 (Mt. Bethel Church Rd.) with SR 1570 (Forbush Rd.) should be considered for future realignment to form one four-legged intersection.

2.5 Public Transportation and Rail Map

There is no fixed route Public Transportation or any active, or inactive rail corridors within Yadkin County. Therefore, a map of this element is not included in the CTP.

2.6 Bicycle Map

The NCDOT envisions that all citizens of North Carolina and visitors to the state should be able to walk and bicycle safely and conveniently to their chosen destinations with reasonable access to roadways. Information on events, funding, maps, policies, projects, and processes dealing with these modes of transportation can be accessed at the Division's web site.

The recommended bicycle element of the Comprehensive Transportation Plan for the county is presented in **Figure 2, Sheet 4.** This plan includes on-road facilities and consists of the existing North Carolina Bicycle Route #2 (Mountains to the Sea). The Bushy Mountains section of NC Route #2, which runs from Manteo to Murphy, enters Yadkin county from the east on SR 1001 (Courtney-Hamptonville Rd.), then heads west to SR 1165 (Fish Brandon Rd.) before connecting with SR 1002 (Lone Hickory Rd.), and continuing on into Iredell County.

More Information on Web
More information about the NCDOT Bicycle and Pedestrian division can be found at: http://www.ncdot.org/transit/bicycle/

The process of determining and evaluating recommendations for the bicycle element of the transportation plan involves many considerations including the goals and objectives of the area, existing properties, environmental impacts, and existing and anticipated land development. There are no recommendations at this time.

2.7 Pedestrian Map

The format for the Pedestrian Map is still under development; therefore no map was included.

3. Population, Land Use, and Traffic

3

In order to fulfill the objectives of an adequate thirty-year transportation plan, reliable forecasts of future travel patterns must be achieved. Such forecasts depend on careful analysis of the following items: historic and potential population changes; significant economic trends, character and intensity of land development; and the ability of the existing transportation system to meet existing and future travel demand. Secondary items that influence forecasts include the effects of legal controls such as zoning ordinances and subdivision regulations, availability of public utilities and transportation facilities, and topographic and other physical features of urban areas located within the county.

3.1 Population

Since the volume of traffic on a roadway is related to the size and distribution of the population that it serves, population data is used to aid the development of the transportation plan. Future population estimates typically rely on the observance of past population trends and counts. **Figure 4** presents the population trends for Yadkin County and North Carolina. This data was provided by the North Carolina State Data Center.

Figure 4: Population Growth

Location	1970	1980	1990	2000	2030
North Carolina	5,082,059	5,881,766	6,628,637	8,046,485	12,447,597
Yadkin County	24,599	28,439	30,488	36,348	56,173

Figure 4: Yadkin County Population Growth

3.2 Land Use

Land use refers to the physical patterns of activities and functions within an area. The generation and attraction of trips created by the land use along a particular transportation facility are related to the types of land use adjacent to that facility and the intensity of land use affects the traffic patterns for multi-modal facilities. For example, a shopping center generates larger traffic volumes than a residential area. The spatial distribution of varying land uses is the predominant determinant of when, where, and why congestion occurs. The attraction between different land uses and their association with travel varies with the size, type, intensity, and spatial separation

of each land use. When dealing with transportation planning, land use is divided into the following classifications:

- Residential – All land is devoted to the housing of people, with the exception of hotels and motels.

- Commercial – All land is devoted to retail trade including consumer and business services and their offices; this may be further stratified into retail and special retail classifications. Special retail would include high-traffic establishments, such as fast-food restaurants and service stations; all other commercial establishments would be considered retail.

- Industrial – All land is devoted to the manufacturing, storage, warehousing, and transportation of products.

- Public – All land is devoted to social, religious, educational, cultural, and political activities; this would include the office and service employment establishments.

3.3 Existing Transportation System

An important stage in the development of a transportation plan is the analysis of the existing roadway system and its ability to serve the area's travel desires. Emphasis is placed not only on detecting the existing deficiencies, but also on understanding the causes of these deficiencies. Travel deficiencies may be localized, resulting from problems with inadequate pavement width, intersection geometry, or intersection controls. Travel deficiencies may also result from system problems, such as the need to construct missing travel links, bypass routes, loop facilities, or additional radial routes.

An analysis of the roadway system looks at both current and future travel patterns and identifies existing and anticipated deficiencies. This is usually accomplished through a traffic collision analysis, roadway capacity deficiency analysis, and a system deficiency analysis. This information is used to analyze factors that will impact the future system, including population growth, economic development potential, and land use trends.

3.4 Traffic Collision Analysis

Traffic collisions or "crashes" are often used as an indicator for locating congestion problems. While often the result of drivers or vehicle performance, collisions may also be a result of the physical characteristics of the roadway. Roadway conditions and obstructions, traffic conditions, and weather may all lead to a collision. While some collisions are the fault of the driver, others may be prevented with physical design changes or traffic control changes such as the installations of stop signs or traffic signals.

Collision data for the period from January 1999 to December 2001 was studied as part of the development for this report. The collision analysis considered both collision frequency and severity. Collision frequency is the total number of reported collisions, while collision severity is the collision rate based upon injuries and property damage incurred. These two factors helped to determine the high collision intersections within the county that are summarized in **Figure 5.**

Figure 5:
Intersections with 15 or more collisions in a Three Year Period
(By Collision Type)
(Jan. 1999-Dec. 2001)

Intersection	Angle	Rear-End	Side-Swipe	Left-Turn	Head-On	Run-Off Road	Other	Total	Severity
US 421 and I-77		2	3			2	10	17	3.47
US 421 and SR 1125 (Asbury Church. Rd.)*	2	12		2	1			18	7.64

Figure 5: High Collision Locations within Yadkin County

*This intersection will be converted to an overpass (no ramps) with the widening of US 421.

The NCDOT is actively involved with investigating and improving many of these intersections. While the scope of this study does not include areas within the Extra-Territorial Jurisdictions of the municipalities within the county, it should be noted that there are several high-accident locations on US 601 between US 421 and SR 1605 (Main St.) in Yadkinville. This section is a 4-lane undivided section, serving a primarily highway business area, including gas stations, fast-food restaurants, and convenience stores. It is recommended that this area of US 601 be studied further to address the safety and congestion problems on this roadway. To request a more detailed analysis for any of the locations listed in **Figure 5**, or other intersections of concern, the county should contact the Division 11 Traffic Engineer. Contact information for the Division 11 Traffic Engineer is included in **Appendix A**.

3.5 Existing Capacity Deficiencies

Roadway capacity deficiencies occur wherever the travel demand volume of a roadway is close to or more than the capacity of that roadway. Travel demand volume is the total number of travelers that wish to use a roadway on a daily basis. The existing travel demand volumes for the county are based upon traffic count data taken annually by the NCDOT Traffic Surveys Unit. Volume to Capacity ratios have been calculated for the 2003 plan year and are shown in **Figure 6**. The projected 2030 travel demand volume to capacity ratios, which are based upon historic and anticipated population, economic growth patterns, and land use trends, are shown in **Figure 7**.

Traffic Count Data

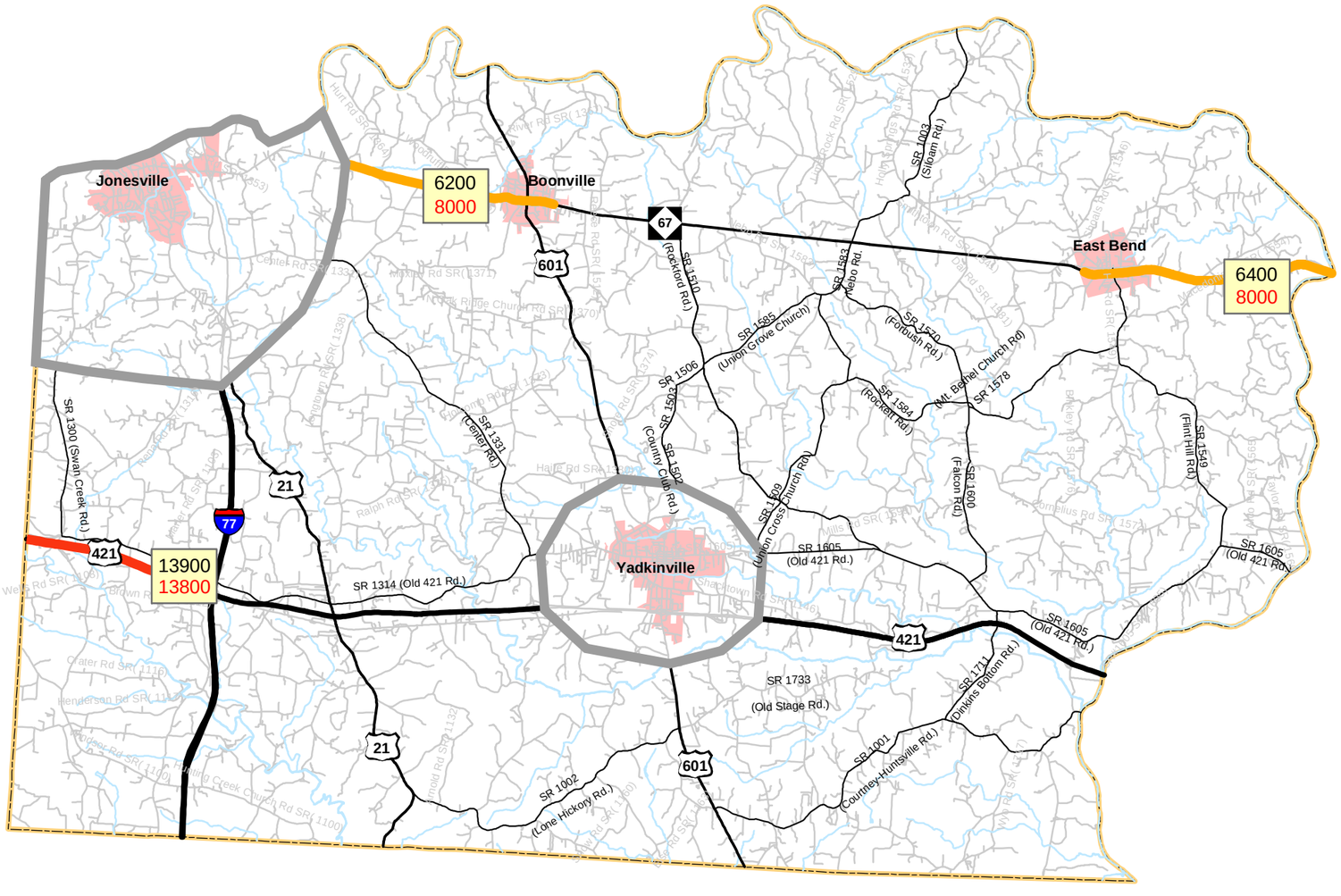
Traffic count data can be found at: http://www.ncdot.org/planning/statewide/traffic_survey/

Figure 6: 2003 Capacity Deficiencies

Yadkin County

Comprehensive Transportation Plan

Plan date: August 12, 2004



Legend

- Near Capacity
- Over Capacity
- Streams and Rivers
- City Boundaries
- Planning Area Boundaries
- Yadkin County Boundary

6200
8000
2003 Average Daily Volume
Current Roadway Capacity

N W E S

0 0.5 1 2 3 Miles

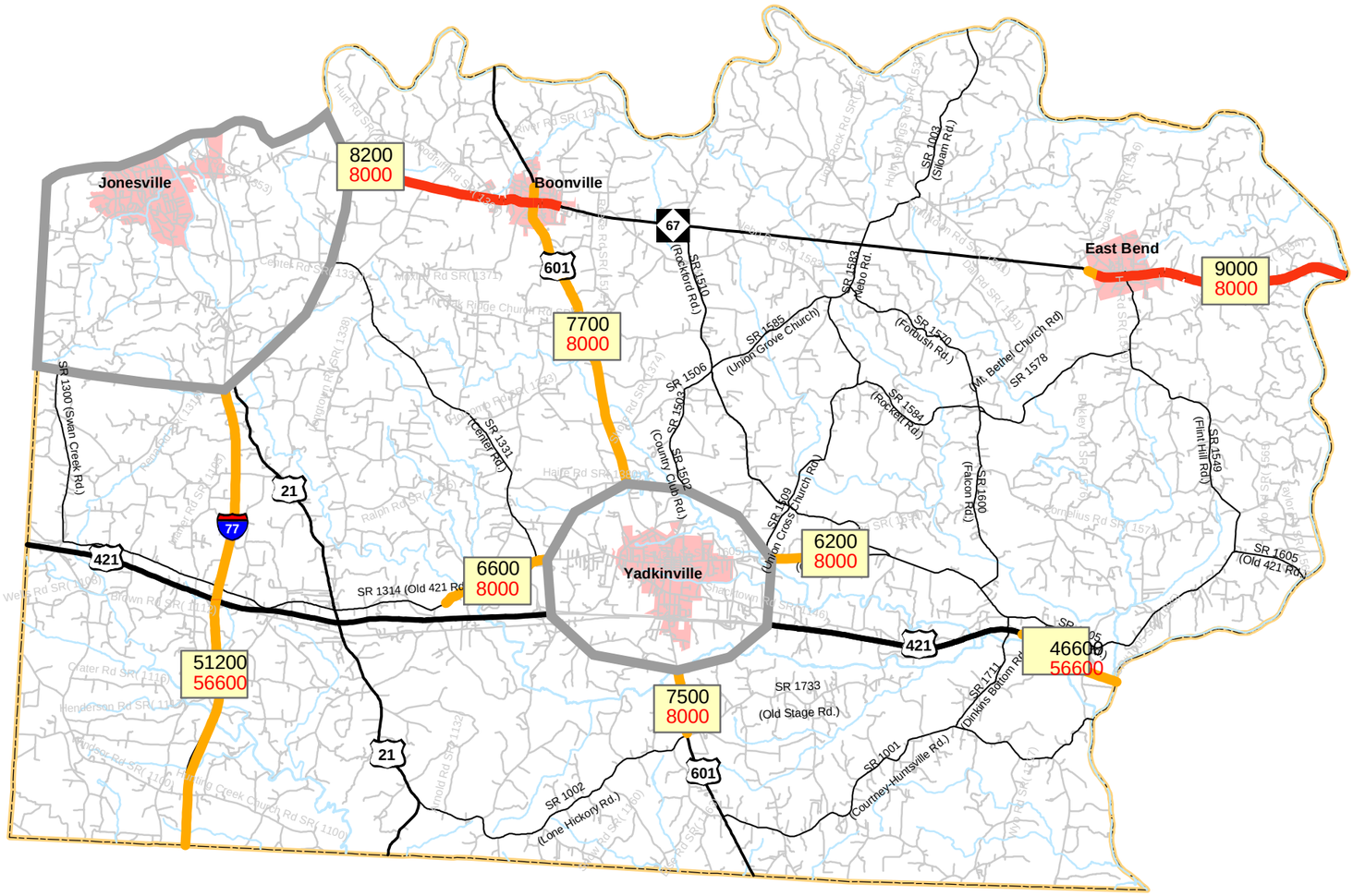
Base map date: June, 2003

Figure 7: 2030 Capacity Deficiencies Without Improvements

Yadkin County

Comprehensive Transportation Plan

Plan date: August 12, 2004



Legend

- Near Capacity
- Over Capacity
- Streams and Rivers
- CityBoundaries
- Planning Area Boundaries
- YadkinCountyBoundary

46600
56600
2030 Average Daily Volume
Roadway Capacity
Without Improvements

Miles
0 0.5 1 2 3

Base map date: June, 2003

Capacity is the maximum number of vehicles that can pass over a given section of roadway during a given time period under prevailing roadway and traffic conditions while still maintaining a service level that is acceptable to drivers. Many factors contribute to the capacity of a roadway, including:

- Geometry of the road, including number of lanes, horizontal and vertical alignment, and proximity of perceived obstructions to safe travel along the road;
- Typical users of the road, such as commuters, recreational travelers, and truck traffic;
- Access control, including streets and driveways, or lack thereof, along the roadway;
- Development of the road, including residential, commercial, and industrial developments;
- Number of traffic signals along the route;
- Peaking characteristics of the traffic on the road;
- Characteristics of side-roads feeding into the road; and
- Directional split of traffic or the percentages of vehicles traveling in each direction along a road at any given time.

Capacity

The number of vehicles that can pass a given point during a specified period under prevailing roadway, traffic, and control conditions. This assumes that there is no influence from downstream traffic operation, such as a backing up of traffic into the analysis point.
(Highway Capacity Manual, 2000)

The relationship of travel demand volume to roadway capacity determines the level-of-service (LOS) of a roadway. Six distinct levels-of-service are possible, with letter designations ranging from LOS A, which represents the best operating conditions, to LOS F, which represents the worst operating conditions. LOS D indicates "practical capacity" of a roadway, or the capacity at which the public begins to express dissatisfaction. The six levels of service are illustrated in **Figure 8**.

Figure 8: Level of Service Descriptions

Design requirements for roadways vary according to the desired capacity and level-of-service. Recommended improvements and overall design of the Transportation Plan were based upon achieving a minimum LOS D on existing facilities and a LOS C on new facilities.

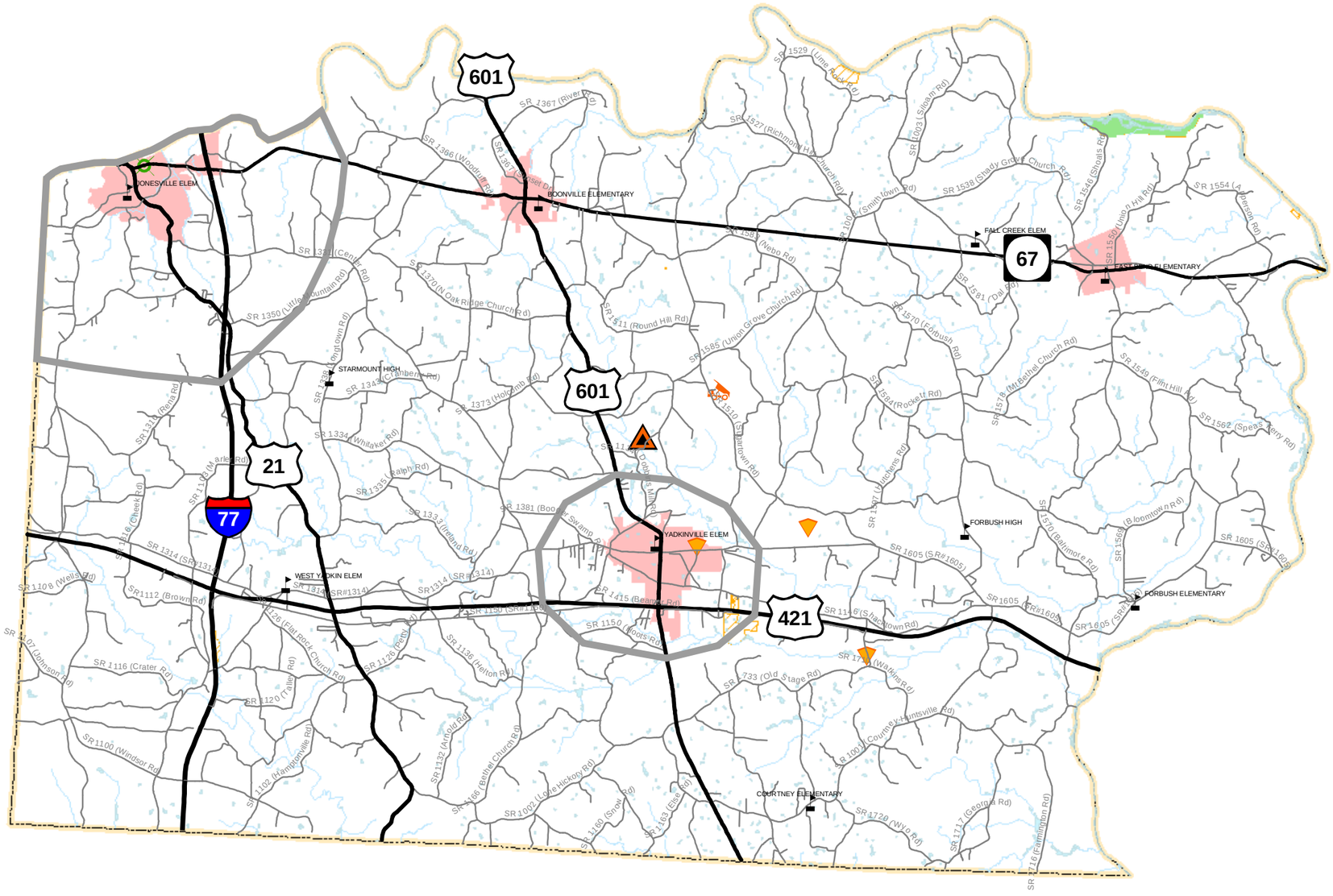
3.6 Environmental Screening

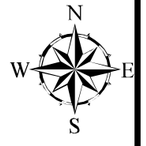
In recent years, the environmental considerations associated with transportation construction have come to the forefront of the planning process. Section 102 of the National Environmental Policy Act (NEPA) requires the completion of an Environmental Impact Statement (EIS) for projects that have a significant impact on the environment. The EIS includes impacts on wetlands, wildlife, water quality, historic properties, and public lands. While this report does not cover the environmental concerns in as much detail as an EIS would, consideration for many of these factors was incorporated in to the development of the Comprehensive Transportation Plan. These factors were also incorporated into the recommended improvements. Environmental features found in the county are shown in **Figure 9**.

Figure 9
Environmental Data

Yadkin County Comprehensive Transportation Plan

Plan Date: August 12, 2004





Legend

- Schools
- Hazardous Disposal Sites
- Discharge Sites
- Ambient Water Monitor Site
- Solid Waste
- National Wetlands Inv. (Line)
- National Wetland Inv. (Area)
- Pilot Mountain State Park
- State Owned Complexes
- City Boundary
- Yadkin County
- Planning Area Boundary

0 1 2 3 Miles

Base map date: June, 2003

3.6.1 Wetlands

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

The National Wetlands Inventory showed several wetlands throughout the county. See **Figure 9** for more information.

3.6.2 Threatened and Endangered Species

The Threatened and Endangered Species Act of 1973 allows the U. S. Fish and Wildlife Service to impose measures on the Department of Transportation to mitigate the environmental impacts of a transportation project on endangered animal and plant species, as well as critical wildlife habitats. Locating any rare species that exist within the county during this early planning stage will help to avoid or minimize impacts. A preliminary review of the Federally Listed Threatened and Endangered Species in the county was completed to determine what effects, if any, the recommended improvements may have on wildlife. Mapping from the N.C. Department of Environment and Natural Resources revealed occurrences of threatened or endangered plant and/or animal species in the county, which are summarized in **Figure 10**. These species are not impacted by any recommendations found in the Comprehensive Transportation Plan.

Figure 10
Threatened or Endangered Species within the County

Species	Common Name	Major Group	Status*	
			NC	Federal
Moxostoma robustum	Robust redhorse	Fish	SR	FSC
Alasmidonta varicosa	Brook Floater	Mollusk	E	SC
Creeper	Strophitus	Mollusk	T	-

Figure 10: Threatened or Endangered Species

* See appendix E for definitions and further information.

3.6.3 Historic Sites

Section 106 of the National Historic Preservation Act requires the Department of Transportation to identify historic properties listed in, as well as eligible for, the National Register of Historic Places (NRHP). The NCDOT must consider the impacts of transportation projects on these properties and consult with the Federal Advisory Council on Historic Preservation. N.C. General Statute 121-12(a) requires the NCDOT to identify historic properties listed on the National Register, but not necessarily those that are eligible to be listed. The NCDOT must consider the impacts and consult with the N.C. Historical Commission, but is not bound by their recommendations.

The location of historic sites within the county was investigated to determine any possible impacts resulting from the recommended improvements. This investigation identified the following properties listed on the NRHP:

- Davis Brothers Store (East Bend)
- Donnaha Site (Archaeology) (East Bend vicinity)
- Durrett-Jarratt House (Enon Vicinity)
- Glenwood (Enon vicinity)
- Richmond Hill Law School (Rockford vicinity)
- Second Yadkin County Jail (Yadkinville)
- The White House (Sofley House) (Huntsville)

None of the locations are impacted by the recommendation presented in this plan.

3.6.4 Archaeological Sites

The location of recorded archaeological sites was researched to determine the possible impacts of proposed roadway projects. This initial investigation identified one site within Yadkin County. The Donnaha Archeological Site is located along the Yadkin River, and is being studied by Wake Forest University.

However, archaeological sites are often difficult to identify without actual field excavation. As a result, possible sites may not be identified during the initial planning process; therefore, each proposed project should be evaluated individually prior to construction.

3.6.5 Educational Facilities

The location of educational facilities in the county was considered during the development of the transportation plan. No proposed facilities or improvements shall displace any school or other educational facility.

4. Public Involvement

4.1 Overview

Since the passage of the Federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the emphasis on public involvement in transportation has taken on a new role. Although public participation has been an element of long range transportation planning in the past, these regulations call for a much more proactive approach. The NCDOT's Transportation Planning Branch has a long history of making public involvement a key element in the development of any long-range transportation plan, no matter the size of the city and/or county. This chapter is designed to provide an overview of the public involvement elements implemented into the development of the transportation plan for the county.

4.2 Study Initiation

The Yadkin County Transportation Plan study was requested on April 1, 2003 by way of a letter from the Northwest Piedmont RPO. The Transportation Planning Branch met with the County Planning Board on July 8, 2003 to identify the primary transportation concerns and to define the scope of the study.

4.3 Public Meetings

One public drop-in session was held during the development of Yadkin County Transportation Plan on February 24, 2004. This meeting was held in the County Commissioners meeting room in Yadkinville. The Northwest Piedmont RPO distributed flyers and other forms of advertising for this meeting, however there was no public attendance.

4.4 Public Hearings

August 2, 2004

An informational meeting was held in the Yadkin County Board of Commissioners meeting room during the Commissioners meeting. The purpose of this meeting was to discuss the findings from the study including deficiencies, improvements, and recommendations and the new comprehensive transportation plan format. One suggestion was made by Commissioner Myers to include SR 1733 (Old Stage Rd.) on the list of minor thoroughfares to be widened to 12 foot lanes. There were no other concerns, and copies of the proposed CTP were left for review.

August 16, 2004

A public hearing was held in the Yadkin County Board of Commissioners meeting room during the commissioners meeting. A new set of maps was presented to the Board, including the change requested by Commissioner Myers. The Commissioners had no further concerns, and opened the floor to questions from those in the audience. There was one question fielded from the audience about the widening of US 421 to six lanes. The questioner was informed that I-77 was recommended to be widened to six lanes, not US 421. There were no other questions. The Board adopted the Transportation Plan by a vote of 5-0.

5. Conclusion

5

Yadkin County is a growing community that will require improvements to their transportation systems over the next thirty years. It is the responsibility of the County to take the initiative for the implementation of the Comprehensive Transportation Plan. It is imperative that the local area aggressively pursues funding for desired projects. Questions regarding funding, projects, planning, and modes of transportation should be addressed to the appropriate branch within NCDOT. **Appendix A** includes contact information for these Branches. If changes are required for any element of the Comprehensive Transportation Plan, then all other elements must be reviewed for resulting impacts.

Appendix A: DOT Contacts

North Carolina Department of Transportation

Customer Service Office
1-877-DOT4YOU
(1-877-368-4968)

Secretary of Transportation
1501 Mail Service Center
Raleigh, NC 27699-1501
(919) 733-2520

Board of Transportation Member
Contact Information for the current Board of Transportation member may be accessed from the NCDOT homepage on the Internet at:
http://www.ncdot.org/board/ or by calling 1-800-DOT4YOU.

Highway Division 11

Division Engineer
Contact the Division Engineer with general questions concerning NCDOT activities within Division 11.
P.O. Box 250
North Wilkesboro, NC 28659
(336)-667-9111

Division Construction Engineer
Contact the Division Construction Engineer for information concerning major roadway improvements under construction.
P.O. Box 250
North Wilkesboro, NC 28659
(336)-903-9117

Division Traffic Engineer
Contact the Division Traffic Engineer for information concerning high-collision locations.
P.O. Box 250
North Wilkesboro, NC 28659
(336)-903-9129

District Engineer
Contact the District Engineer for information regarding Driveway Permits, Right of Way Encroachments, and Development Reviews.
P.O. Box 558
Elkin ,NC 28621
(336) 835-4241

County Maintenance Engineer
Contact the County Maintenance Engineer with any maintenance activities, such as drainage, repaving, dead animals, or roadway conditions.
1636 Shacktown Rd.
Yadkinville, NC 27055
(336) 667-2242

Centralized Personnel

Transportation Planning Branch
Contact the Transportation Planning Branch with long-range planning questions.
1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705

Secondary Roads Office
Contact the Secondary Roads office for information regarding the Industrial Access Funds Program, information about paving priorities, or how to get a road added to the state Maint. system.
1535 Mail Service Center
Raleigh, NC 27699-1535
(919) 733-3520

Program Development Branch
Contact the Program Development Branch for information about current TIP projects, or the current Roadway Official Corridor Maps.
1534 Mail Service Center
Raleigh, NC 27699-1534
(919) 733-2039

Geographic Information Systems Unit (GIS)
Contact GIS to order County Road maps and for other available maps. Online ordering available at: http://www.ncdot.org/planning/statewide/gis/
3401 Carl Sandburg Ct
Raleigh, NC 27610
(919) 212-6000

Appendix B: Comprehensive Transportation Plan Definitions

Highway Map Category Definitions

- Freeways[X]
  - Functional purpose – high mobility, high volume, high speed
  - Posted speed – 55 mph or greater
  - X section – minimum four lanes with continuous median
  - Multi-modal elements – High Occupancy Vehicles/High Occupancy Transit lanes, busways, truck lanes, park-and-ride facilities at/near interchanges, adjacent shared use paths (separate from roadway and outside ROW)
  - Type of access control – full control of access
  - Access management – interchange spacing (urban – one mile; non-urban – three miles); at interchanges on the intersecting roadway , full control of access for 1,000' or for 350' plus 650' island or median; use of frontage roads, rear service roads
  - Intersecting facilities – interchange or grade separation (no signals or at-grade intersections)
  - Driveways – not allowed
- Expressways[X]
  - Functional purpose – high mobility, high volume, medium-high speed
  - posted speed – 45 to 60 mph
  - X section – minimum four lanes with median
  - Multi-modal elements – High Occupancy Vehicle lanes, busways, very wide paved shoulders (rural), shared use paths (separate from roadway but within ROW)
  - Type of access control –limited or partial control of access;
  - Access management – minimum interchange/intersection spacing 2000'; median breaks only at intersections with minor roadways or to permit U-turns; use of frontage roads, rear service roads; driveways limited in location and number; use of acceleration/deceleration or right turning lanes
  - Intersecting facilities – interchange; at-grade intersection for minor roadways; right-in/right-out and/or left-over or grade separation (no signalization for through traffic);
  - Driveways – right-in/right-out only; direct driveway access via service roads or other alternate connections

- Boulevards
  - Functional purpose – moderate mobility; moderate access, moderate volume, medium speed
  - Posted speed – 30 to 55 mph
  - X section – two or more lanes with median (median breaks allowed for U-turns per *Driveway Manual*
  - Multi-modal elements – bus stops, bike lanes (urban) or wide paved shoulders (rural), sidewalks (urban - local government option)
  - Type of access control – limited control of access, partial control of access, or no control of access
  - Access management – two lane facilities may have medians with crossovers, medians with turning pockets or turning lanes; use of acceleration/deceleration or right turning lanes is optional; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
  - Intersecting facilities – at grade intersections and driveways; interchanges at special locations with high volumes
  - Driveways – primarily right-in/right-out, some right-in/right-out in combination with median leftovers; major driveways may be full movement when access is not possible using an alternate roadway.

- Other Major Thoroughfares –
  - Functional purpose – balanced mobility and access, moderate volume, low to medium speed
  - Posted speed – 25 to 55 mph
  - X section – four or more lanes without median
  - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
  - Type of access control – no control of access
  - Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
  - Intersecting facilities – intersections and driveways
  - Driveways – full movement on two lane with center turn lane as permitted by the *Driveway Manual*

- Minor Thoroughfares –
  - Functional purpose – balanced mobility and access, moderate volume, low to medium speed
  - Posted speed – 25 to 45 mph
  - X section – ultimately three lanes (no more than one lane per direction) or less without median;
  - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
  - ROW – no control of access
  - Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
  - Intersecting facilities – intersections and driveways
  - Driveways – full movement on two lane with center turn lane as permitted by the *Driveway Manual*

Other Definitions

- Existing – Roadway facilities that are not recommended to be improved.
- Needs Improvement – Roadway facilities that need to be improved for capacity, safety, or system continuity. The improvement to the facility may be widening, other operational strategies, increasing the level of access control along the facility, or a combination of improvements and strategies. "**Needs improvement" does not refer to the maintenance needs of existing facilities.**
- Recommended – Roadway facilities on new location that are needed in the future.
- Interchange – Through movement on intersecting roads is separated by a structure. Turning movement area accommodated by on/off ramps and loops.
- Grade Separation – Through movement on intersecting roads is separated by a structure. There is no direct access between the facilities.
- Full Control of Access – Connections to a facility provided only via ramps at interchanges. No private driveway connections allowed.
- Limited Control of Access – Connections to a facility provided only via ramps at interchanges (major crossings) and at-grade intersections (minor crossings and service roads). No private driveway connections allowed.
- Partial Control of Access – Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways. Private driveway connections shall be defined as a maximum of one connection per parcel. One connection is defined as one ingress and one egress point. These may be combined to form a two-way driveway (most common) or separated to allow for better traffic flow through the parcel. The use of shared or consolidated connections is highly encouraged.
- No Control of Access – Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways.

Bicycle Map

Category Definitions

- On Road-Existing – Conditions for bicycling on the highway facility are adequate to safely accommodate cyclists.
- On Road-Needs Improvement – At the systems level, it is desirable for the highway facility to accommodate bicycle transportation; however, highway improvements are necessary to create safe travel conditions for the cyclists.
- On Road-Recommended – At the systems level, it is desirable for a recommended highway facility to accommodate bicycle transportation. The highway should be designed and built to safely accommodate cyclists.
- Off Road-Existing – A facility that accommodates bicycle transportation (may also accommodate pedestrians, i.e. a greenway) and is physically separated from a highway facility usually on a separate right-of-way.
- Off Road-Needs Improvement – A facility that accommodates bicycle transportation (may also accommodate pedestrians, e.g. greenways) and is physically separated from a highway facility usually on a separate right-of-way that will not adequately serve future bicycle needs. Improvements may include but are not limited to: widening, paving (not re-paving), improved horizontal or vertical alignment.
- Off Road-Recommended – A facility needed to accommodate bicycle transportation (may also accommodate pedestrians, e.g. greenways) and is physically separated from a highway facility usually on a separate right-of-way. This may also include greenway segments that do not necessarily serve a transportation function but intersect recommended facilities on the highway map or public transportation and rail map.

[X]Every effort will be made to ensure that all facilities identified by the Strategic Highway Corridor Map will be a Freeway or Expressway on the Comprehensive Transportation Plan.

Blank

Facility & Section	DIST	2002 CONDITIONS RDWY	ROW	NUMBER OF LANES	CURRENT CAPACITY	2002 AADT	2030 CONDITIONS RDWY	ROW	NUMBER OF LANES	PROPOSED CAPACITY	2030 AADT	Rec. Cross Section
	MI	FT	FT		(VPD)	(VPD)	FT	FT		(VPD)	(VPD)	
I-77												
Iredell Co. toUS 421	4.71	48	350	4	56600	26000	72	ADQ	6	87400	46900	L
US 421to US 21	5.20	48	300	4	56600	31000	72	ADQ	6	87400	54300	L
US 21 to NC 67	2.91	48	260	4	56600	32000	72	ADQ	6	87400	57300	L
NC 67 to Surry Co.	0.91	48	290	4	56600	33000	72	ADQ	6	87400	59000	L
US 21												
Iredell Co.toSR 1002	1.25	20	60	2	6000	3000	24	ADQ	2	9600	5100	K
SR 1002toSR 1171	3.48	22	60	2	6800	3100	24	ADQ	2	9600	4100	K
SR 1171toSR 1314	0.66	36	60	3	9600	2800	36	ADQ	2	9600	4100	H
SR 1314toSR 1103	2.94	22	60	2	6800	1500	24	ADQ	2	9600	5100	K
SR 1103toSR 1347	1.45	21	60	2	6800	3500	24	ADQ	2	9600	5300	K
SR 1347tol to77	1.66	20	100	2	6000	3500	24	ADQ	2	9600	5300	K
US 421												
Forsyth Co. to SR 1711	2.30	48	240	4	56600	22000	48	ADQ	4	56600	54600	A
SR 1711 to SR 1710	2.49	48	275	4	56600	19000	48	ADQ	4	56600	47200	A
SR 1710 to US 601	3.73	48	275	4	56600	18000	48	ADQ	4	56600	44700	A
US 601 to US 21	6.48	48	295	4	56600	18000	48	ADQ	4	56600	44700	A
US 21 to I-77	2.37	48	295	4	56600	16000	48	ADQ	4	56600	39700	A
I-77 to Wilkes Co.	3.83	24	250	2	9600	13000	48	ADQ	4	56600	32300	A
US 601												
Davie Co. to SR 1002	1.28	20	80	2	6000	3900	24	ADQ	2	11000	7400	K[1]
SR 1002 to PAB Yadkinville	3.63	20	80	2	6000	6100	24	ADQ	2	11000	9400	K[1]
PAB Yadkinville to SCL Boonville	4.03	22	60	2	6800	5700	24	ADQ	2	11000	9800	K[1]
SCL Boonville to NC 67	0.50	29	60	2	8800	6100	29	ADQ	2	9600	9400	K
NC 67 to SR 1367	0.30	38	100	2	9600	5000	38	ADQ	2	9600	7500	I
SR 1367 to NCL Boonville	0.54	20	100	2	6000	4400	24	ADQ	2	9600	7400	K
NCL Boonville to Surry Co.	2.05	20	100	2	6000	3700	24	ADQ	2	11000	7300	K[1]
NC 67												
Jonesville PABto SR 1366	2.52	20	80	2	6000	6200	24	ADQ	2	11000	10800	K
SR 1366 to US 601	0.78	36	80	2	8000	7100	36	ADQ	2	9600	9300	I
US 601 to Transou Ave.	0.30	40	60	2	8800	7600	40	ADQ	2	9600	6800	I
Transou Ave. to ECL Boonville	0.40	20	100	2	6000	7600	24	ADQ	2	9600	6800	K
ECL Boonville to SR 1510	2.25	20	100	2	6000	4800	24	ADQ	2	11000	5700	K[1]
SR 1510 to WCL East Bend	7.76	20	100	2	6000	4200	24	ADQ	2	11000	4700	K[1]
WCL East Bend toSR 1548	0.38	22	100	2	6800	6500	24	ADQ	2	9600	7200	K
SR 1548 to High St.	0.60	36	100	3	9600	6800	36	ADQ	3	9600	8800	H
High St. ECL East Bend	0.67	22	100	2	6800	6800	24	ADQ	2	9600	8800	K
ECL East Bend to Forsyth Co.	3.62	20	100	2	6000	7100	24	ADQ	2	11000	10600	K[1]

Facility & Section	DIST	2002 CONDITIONS RDWY	ROW	NUMBER OF LANES	CURRENT CAPACITY	2002 AADT	2030 CONDITIONS RDWY	ROW	NUMBER OF LANES	PROPOSED CAPACITY	2030 AADT	Rec. Cross Section
	MI	FT	FT		(VPD)	(VPD)	FT	FT		(VPD)	(VPD)	
SR 1001 (Courtney Huntsville Rd.)												
US 601 to SR 1725	1.19	23	50	2	8000	2200	ADQ	ADQ	2	8000	2900	K^2
SR 1725 to SR 1711	4.42	19	50	2	6000	1600	ADQ	ADQ	2	8000	2100	K^2
SR 1711 to SR 1716	2.06	19	50	2	6000	1200	ADQ	ADQ	2	8000	1600	K^2
SR 1716 to Forsyth Co.	1.20	19	50	2	6000	1600	ADQ	ADQ	2	8000	2200	K^2
SR 1002 (Lone Hickory Rd.)												
US 601 to SR 1159	3.49	20	Maintained	2	6000	2200	ADQ	ADQ	2	8000	2900	K^2
SR 1159 to US 21	2.78	20	Maintained	2	6000	1200	ADQ	ADQ	2	8000	1700	K^2
SR 1003 (Siloam Rd.)												
Surry Co. to SR 1541	3.71	20	60	2	6000	1100	ADQ	ADQ	2	8000	1400	K
SR 1541 to SR 1527	1.12	18	60	2	5600	1400	ADQ	ADQ	2	8000	1900	K
SR 1527 to NC 67	0.45	18	60	2	5600	2600	ADQ	ADQ	2	8000	3500	K
SR 1165 (Joyner Rd.)												
SR 1002 to Iredell Co.	0.60	20	60	2	6000	650	ADQ	ADQ	2	8000	750	K^2
SR 1165 (Fish Brandon Rd.)												
US 601 to SR 1002	1.80	18	60	2	5600	700	ADQ	ADQ	2	8000	800	K^2
SR 1300 (Swan Creek Rd.)												
Jonesville PAB to SR 1314	3.28	20	Maintained	2	6000	2000	ADQ	ADQ	2	8000	2700	K
SR 1314 (Old 421 Rd.)												
Yadkinville PAB to SR 1331	0.20	22	Maintained	2	6800	4900	ADQ	ADQ	2	8000	6600	K
SR 1331 to US 21	4.25	20	Maintained	2	6000	2300	ADQ	ADQ	2	8000	3000	K
US 21 to SR 1103	2.78	18	Maintained	2	5600	2600	ADQ	ADQ	2	8000	3500	K
SR 1103 to SR 1300	2.67	18	Maintained	2	5600	1000	ADQ	ADQ	2	8000	1400	K
SR 1300 to Wilkes Co.	0.68	18	Maintained	2	5600	800	ADQ	ADQ	2	8000	1000	K
SR 1331 (Center Rd.)												
SR 1314 to SR 1381	0.85	18	Maintained	2	5600	1900	ADQ	ADQ	2	8000	2500	K
SR 1381 to SR 1368	2.61	18	Maintained	2	5600	2700	ADQ	ADQ	2	8000	3600	K
SR 1368 to Jonesville PAB	4.05	18	Maintained	2	5600	2900	ADQ	ADQ	2	8000	3900	K

Facility & Section	DIST	2002 CONDITIONS RDWY	ROW	NUMBER OF	CURRENT CAPACITY	2002 AADT	2030 CONDITIONS RDWY	ROW	NUMBER OF	PROPOSED CAPACITY	2030 AADT	Rec. Cross
	MI	FT	FT	LANES	(VPD)	(VPD)	FT	FT	LANES	(VPD)	(VPD)	Section
SR 1502 (Country Club Rd.)												
Yadkinville PAB to SR 1503	1.04	20	60	2	6000	2200	ADQ	ADQ	2	8000	3000	K
SR 1503 (Country Club Rd.)												
SR 1502 to SR 1506	1.03	20	60	2	6000	1400	ADQ	ADQ	2	8000	1800	K
SR 1506 (Rockford Rd.)												
SR 1503 to SR 1510	0.60	20	60	2	6000	2200	ADQ	ADQ	2	8000	3000	K
SR 1509 (Union Cross Church Rd.)												
SR 1605 to SR 1510	1.10	18	Maintained	2	5600	1900	ADQ	ADQ	2	8000	2500	K
SR 1510 to SR 1584	2.50	18	Maintained	2	5600	1400	ADQ	ADQ	2	8000	1800	K
SR 1510 (Rockford Rd.)												
NC 67 to SR 1506	2.86	20	60	2	6000	1500	ADQ	ADQ	2	8000	2000	K
SR 1510 (Sugartown Rd.)												
SR 1506 to SR 1509	3.20	20	60	2	6000	1100	ADQ	ADQ	2	8000	1400	K
SR 1510 (Pilot View Church Rd.)												
SR 1509 to SR 1599	1.40	18	60	2	5600	1100	ADQ	ADQ	2	8000	1400	K
SR 1599 to SR 1605	1.00	20	60	2	6000	1400	ADQ	ADQ	2	8000	1800	K
SR 1549 (Flint Hill Rd.)												
SR 1605 to SR 1562	2.69	18	Maintained	2	5600	2600	ADQ	ADQ	2	8000	3500	K
SR 1562 to SCL East Bend	3.31	18	Maintained	2	5600	2200	ADQ	ADQ	2	8000	3000	K
SCL East Bend to NC 67	0.35	18	Maintained	2	5600	4000	ADQ	ADQ	2	8000	4600	K
SR 1570 (Nebo Rd.)												
NC 67 to SR 1583	0.85	20	Maintained	2	6000	2900	ADQ	ADQ	2	8000	3800	K
SR 1570 (Forbush Rd.)												
SR 1583 to SR 1600	4.90	20	Maintained	2	6000	1200	ADQ	ADQ	2	8000	1500	K
SR 1578 (Mt. Bethel Church Rd.)												
SR 1579 to SR 1549	2.80	18	60	2	5600	750	ADQ	ADQ	2	8000	1000	K
SR 1579 (Mt. Bethel Church Rd.)												
SR 1570 to SR 1578	0.80	18	60	2	5600	650	ADQ	ADQ	2	8000	800	K
SR 1583 (Nebo Rd.)												
SR 1585 to SR 1570	0.60	20	60	2	6000	2900	ADQ	ADQ	2	8000	3800	K

Facility & Section	DIST	2002 CONDITIONS RDWY	ROW	NUMBER OF LANES	CURRENT CAPACITY	2002 AADT	2030 CONDITIONS RDWY	ROW	NUMBER OF LANES	PROPOSED CAPACITY	2030 AADT	Rec. Cross Section
	MI	FT	FT		(VPD)	(VPD)	FT	FT		(VPD)	(VPD)	
SR 1584 (Rockett Rd.)												
SR 1509 to SR 1595	0.50	18	var.	2	5600	1400	ADQ	ADQ	2	8000	1800	K
SR 1595 to SR 1570	1.90	18	var.	2	5600	650	ADQ	ADQ	2	8000	800	K
SR 1585 (Union Grove Church Rd.)												
SR 1583 to SR 1510	2.60	20	var.	2	6000	1900	ADQ	ADQ	2	8000	2500	K
SR 1595 (Union Cross Church Rd.)												
SR 1583 to SR 1584	1.80	19	Maintained	2	5800	1400	ADQ	ADQ	2	8000	1800	K
SR 1600 (Falcon Rd.)												
SR 1570 to SR 1637	2.60	20	var.	2	6000	2700	ADQ	ADQ	2	8000	3600	K
SR 1637 to SR 1605	0.10	36	var.	2	9600	2700	ADQ	ADQ	3	9600	3600	H
SR 1605 (Old 421 Rd.)												
Forsyth Co. to SR 1549	1.47	22	Maintained	2	6800	4300	ADQ	ADQ	2	8000	4800	K
SR 1549 to SR 1146	5.30	22	Maintained	2	6800	2200	ADQ	ADQ	2	8000	3000	K
SR 1146 to SR 1637	0.50	22	Maintained	2	6800	2200	ADQ	ADQ	2	8000	3000	K
SR 1637 to End Turn Lanes	0.48	32	Maintained	3	9600	3600	ADQ	ADQ	3	9600	4400	H
End Turn Lanes to SR 1510	1.62	22	Maintained	2	6800	3300	ADQ	ADQ	2	8000	4100	K
SR 1510 to Yadkinville PAB	2.35	20	Maintained	2	6000	2200	ADQ	ADQ	2	8000	3000	K
SR 1711 (Speer Bridge Rd.)												
SR 1605 to SR 1001	2.50	20	60	2	6000	1600	ADQ	ADQ	2	8000	2100	K

[1]Includes construction of passing lanes, capacity is 9600 without.

[2] Paved shoulders should be considered to accommodate bicycle traffic..

*Maintained Right of Way would be the width that DOT has been maintaining on a specific road for a period of time. Example" Ditch to Ditch".
Information provided by NCDOT Division 11 Right of Way Unit.

Appendix D

TYPICAL HIGHWAY CROSS SECTIONS

Cross section requirements for highways vary according to the desired capacity and level of service to be provided. Universal standards in the design of highways are not practical. Each street section must be individually analyzed and its cross section requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way. Typical cross section recommendations are shown starting on page D-5. These cross sections are typical for facilities on new location and where right-of-way constraints are not critical. For widening projects and urban projects with limited right-of-way, special cross sections should be developed that meet the needs of the project.

The recommended typical cross sections shown in Appendix D were derived on the basis of projected traffic, existing capacities, desirable levels of service, and available right-of-way.

On all existing and proposed highways delineated on the Transportation plan, adequate right-of-way should be protected or acquired for the ultimate cross sections. Ultimate desirable cross sections for each of the highways are listed in Appendix C. Recommendations for "ultimate" cross sections are provided for the following:

1. Highways which may require widening after the current planning period
2. Highways which are borderline adequate and accelerated traffic growth could render them deficient
3. Highways where an urban curb and gutter cross section may be locally desirable because of urban development or redevelopment.

A - Four Lanes Divided with Median – Freeway/Expressway

Typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 46 ft, but a wider median is desirable.

B - Seven Lanes - Curb & Gutter

This cross section is not recommended for new projects. When the conditions warrant six lanes, cross section "D" should be recommended. Cross section "B" should be used only in special situations such as when widening from a five-lane section and right-of-way is limited. Even in these situations, consideration should be given to converting the center turn lane to a median so that cross section "D" is the final cross section.

C - Five Lanes - Curb & Gutter

Typical for major thoroughfares, this cross section is desirable where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

D - Six Lanes Divided with Raised Median - Curb & Gutter
E - Four Lanes Divided with Raised Median - Curb and Gutter

These cross sections are typically used on Expressways and Boulevards where left turns and intersection streets are not as frequent. Left turns would be restricted to a few selected intersections. The 16-ft median is the minimum recommended for an urban boulevard type cross section. In most instances, monolithic construction should be utilized due to greater cost effectiveness, ease and speed of placement, and reduced future maintenance requirements. In special cases, grassed or landscaped medians result in greatly increased maintenance costs and an increase danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

F - Four Lanes Divided – Expressway/Boulevard, Grass Median

Recommended for urban boulevards or expressways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 ft is recommended with 30 ft being desirable.

G - Four Lanes - Curb & Gutter

This cross section is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections. This cross section should be used only if the above criteria is met. If right-of-way is not restricted, future strip development could take place and the inner lanes could become de facto left turn lanes.

H - Three Lanes - Curb & Gutter

In urban environments, thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section “H”.

I - Two Lanes - C&G, Parking both sides
J - Two Lanes - C&G, Parking one side

Cross section “I” and “J” are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions.

Cross section "I" would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

K - Two Lanes - Paved Shoulder

This cross section is used in rural areas or for staged construction of a wider multi-lane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time. For areas that are growing and future widening will be necessary, the full right-of-way of 100-ft should be required. In some instances, local ordinances may not allow the full 100-ft. In those cases, 70 ft should be preserved with the understanding that the full 100-ft will be preserved by use of building setbacks and future street line ordinances.

L - Six Lanes Divided with Grass Median – Freeway/Expressway

Cross section "L" is typical for controlled access freeways/expressways. The 46 ft grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Right-of-way requirements would typically vary upward from 228 ft depending upon cut and fill requirements.

M - Eight Lanes Divided with Raised Median - Curb & Gutter

This cross section may be recommended for expressways/boulevards going through major urban areas or for routes projected to carry very high volumes of traffic.

General

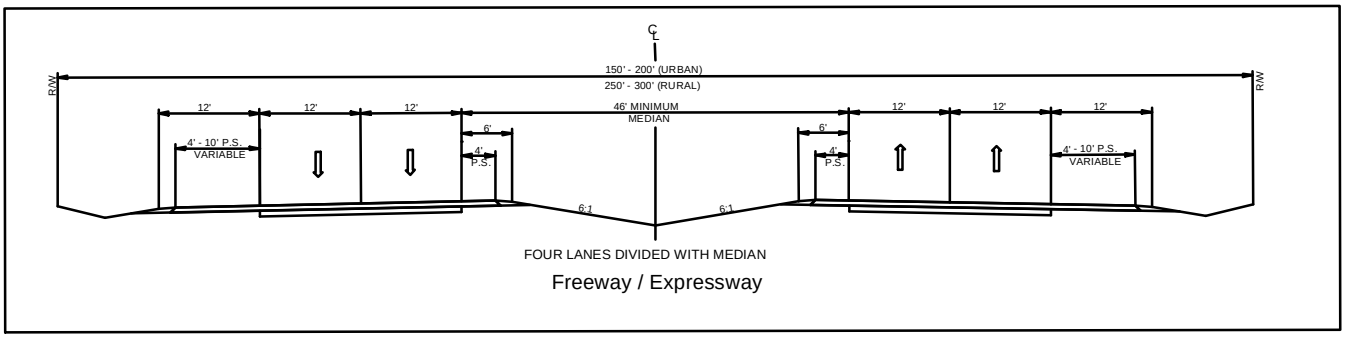
The urban curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

The right-of-ways shown for the typical cross sections are the minimum right-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

APPENDIX D:

TYPICAL HIGHWAY CROSS SECTIONS

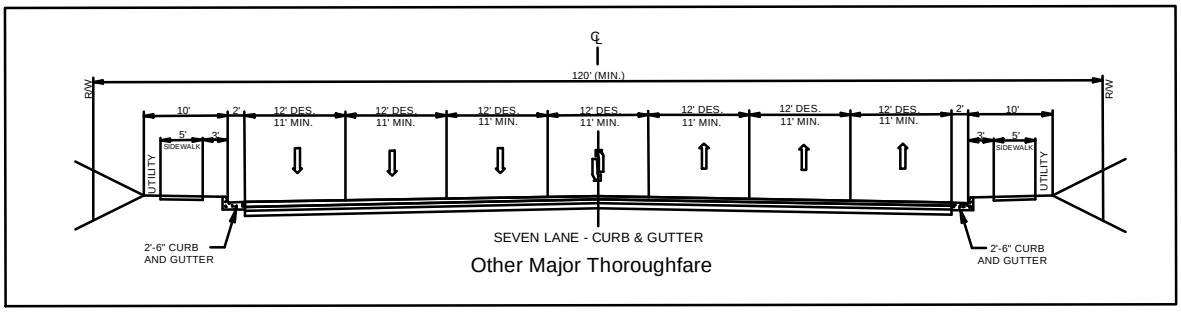
A



FOUR LANES DIVIDED WITH MEDIAN

Freeway / Expressway

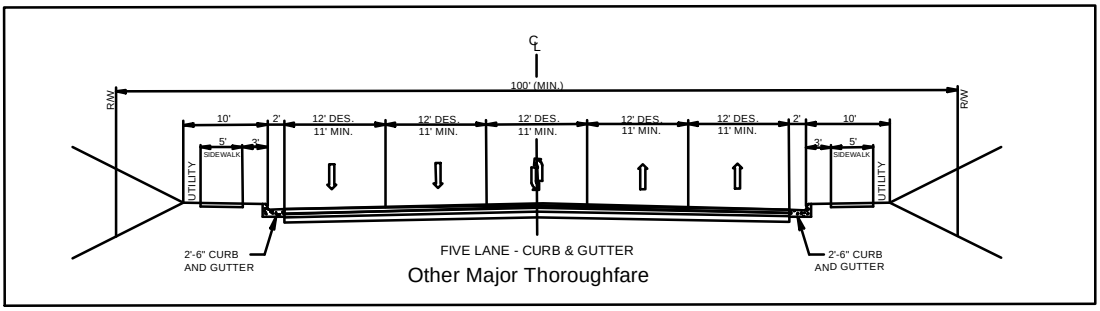
B



SEVEN LANE - CURB & GUTTER

Other Major Thoroughfare

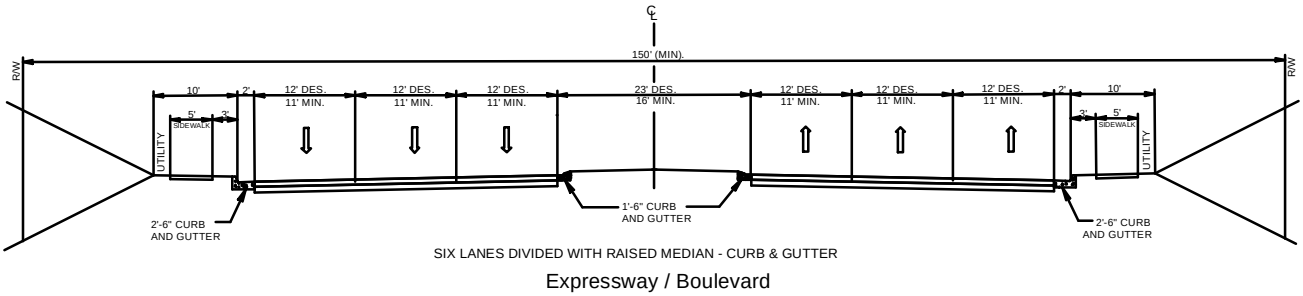
C



FIVE LANE - CURB & GUTTER

Other Major Thoroughfare

D



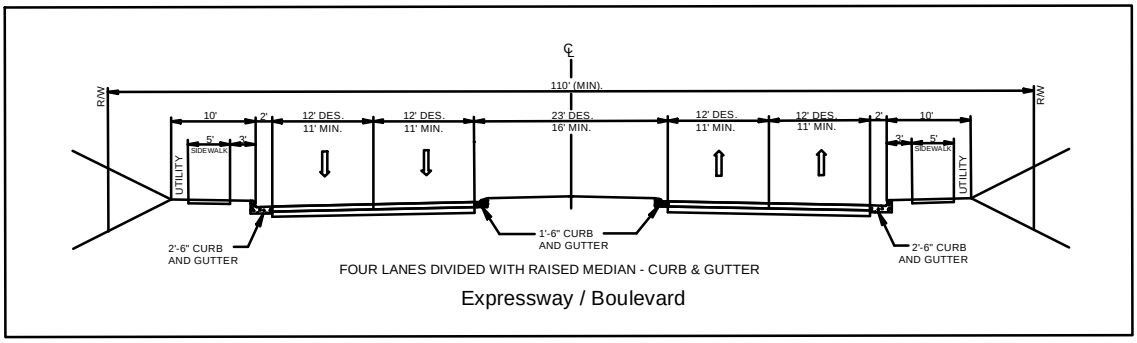
SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

Expressway / Boulevard

APPENDIX D:

TYPICAL HIGHWAY CROSS SECTIONS

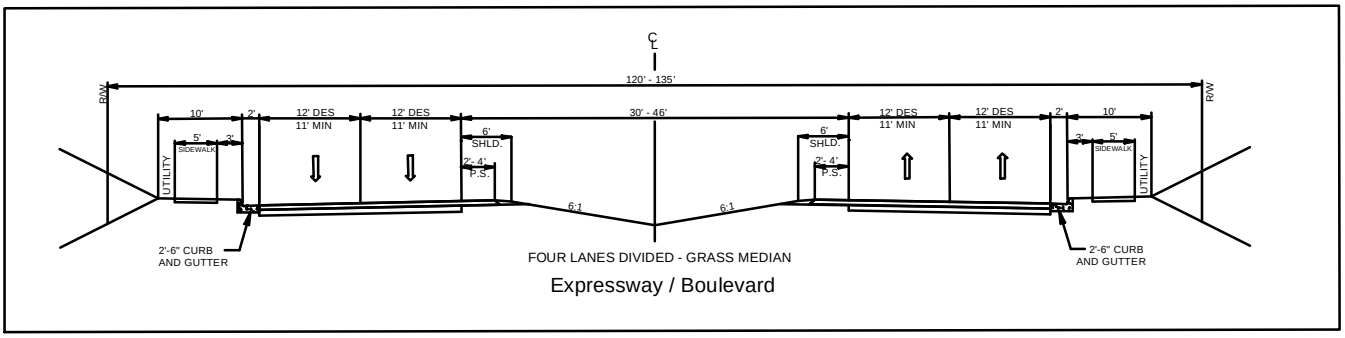
E



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

Expressway / Boulevard

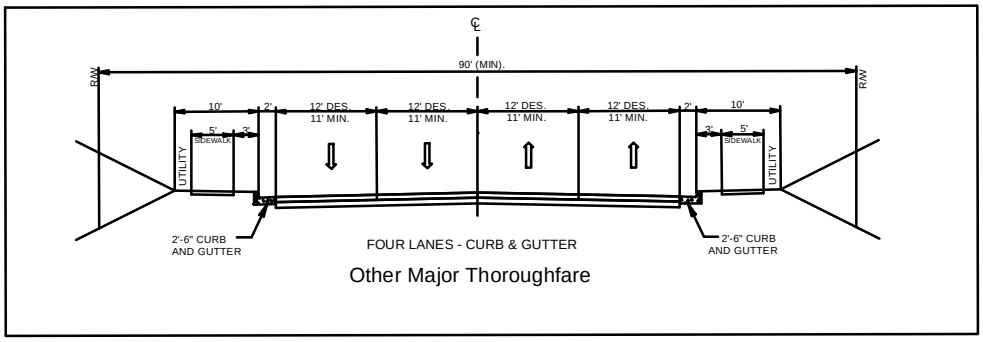
F



FOUR LANES DIVIDED - GRASS MEDIAN

Expressway / Boulevard

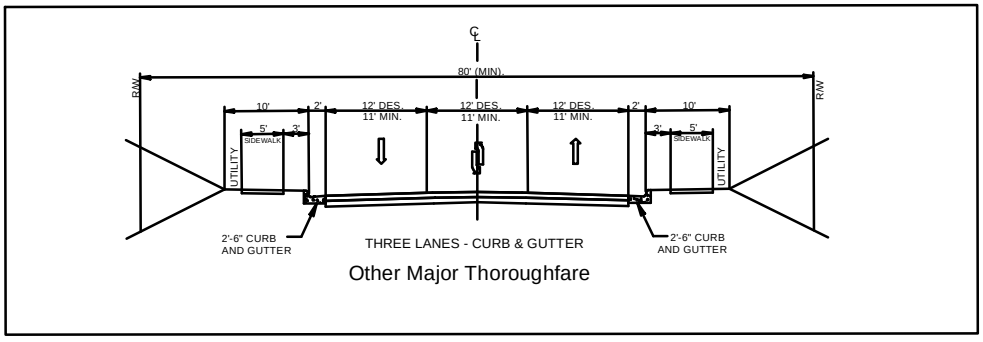
G



FOUR LANES - CURB & GUTTER

Other Major Thoroughfare

H



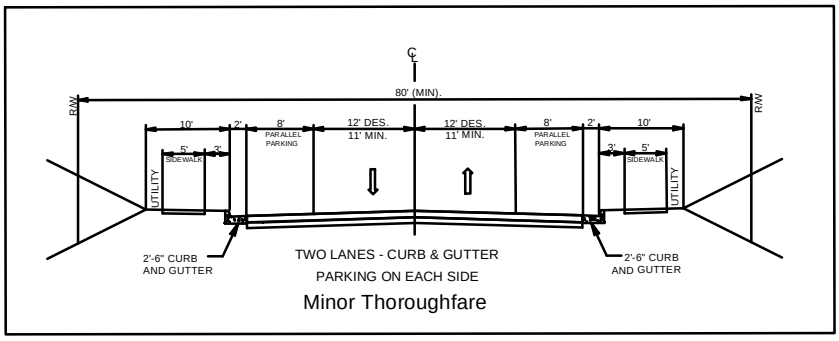
THREE LANES - CURB & GUTTER

Other Major Thoroughfare

APPENDIX D:

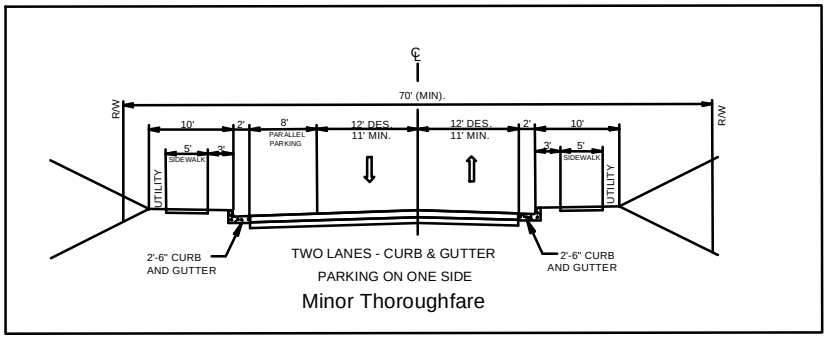
TYPICAL HIGHWAY CROSS SECTIONS

I



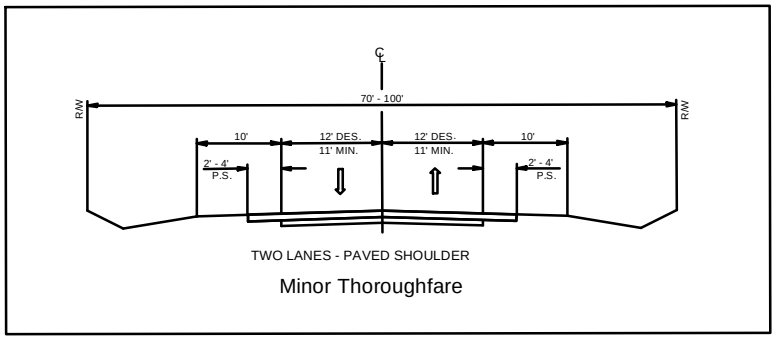
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE
Minor Thoroughfare

J



TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE
Minor Thoroughfare

K

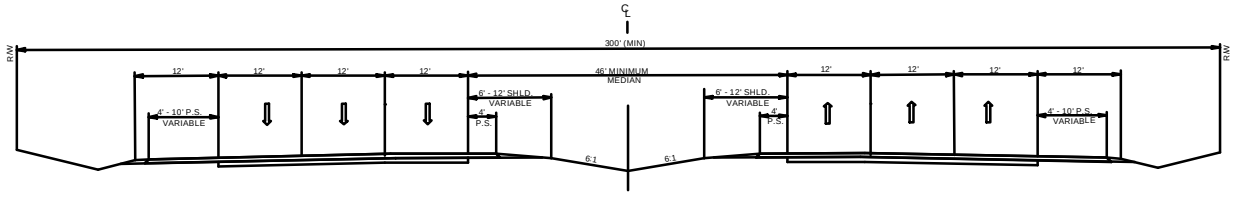


TWO LANES - PAVED SHOULDER
Minor Thoroughfare

APPENDIX D:

TYPICAL HIGHWAY CROSS SECTIONS

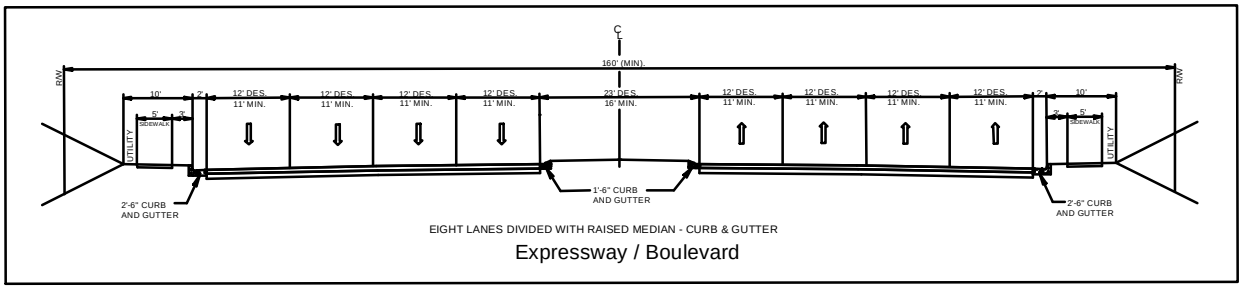
L



SIX LANES DIVIDED WITH GRASS MEDIAN

Freeway / Expressway

M



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

Expressway / Boulevard

Appendix E: Definitions of Environmental Status Codes

Definitions of Environmental Status Codes: Natural Heritage Program Plant List*

North Carolina Status		Description
E	**Endangered**	"Any species or higher taxon of plant whose continued existence as a viable component of the States flora is determined to be in jeopardy" (GS 19B 106: 202.12). (Endangered species may not be removed from the wild except when a permit is obtained for research, propagation, or rescue which will enhance the survival of the species).
T	**Threatened**	"Any resident species of plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (GS 19B 106: 202.12). (Regulations are the same as for Endangered Species).
SC	**Special Concern**	"Any species of plant in North Carolina which requires monitoring but which may be collected and sold under regulations adopted under the provisions of [the Plant Protection and Conservation Act]" (GS 19B 106:202.12). (Special Concern species which are not also listed as Endangered or Threatened may be collected from the wild and sold under specific regulations. Propagated material only of Special Concern species which are also listed as Endangered or Threatened may be traded or sold under specific regulations.)
C	**Candidate**	Species which are very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are also either rare throughout their ranges (fewer than 100 populations total) or disjunct in North Carolina from a main range in a different part of the country or world. Also included are species which may have 20-50 populations in North Carolina, but fewer than 50 populations worldwide. These are species which have the preponderance of their distribution in North Carolina and whose fate depends largely on their conservation here. Also included are many

* Natural Heritage Program List of the Rare Plants of North Carolina. U. S. Fish and Wildlife Service 1990 (with amendments 1993).

		species known to have once occurred in North Carolina but with no known extant occurrences in the state (historical or extirpated species); if these species are relocated in the state, they are likely to be listed as Endangered or Threatened. If present land use trends continue, candidate species are likely to merit listing as Endangered or Threatened.
SR	**Significantly Rare**	Species which are very rare in North Carolina, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats which are unusual in North Carolina. Also included are some species with 20-100 populations in North Carolina, if they also have only 50-100 populations rangewide and are declining.
W	**Watch List**	Any other species believed to be rare and of conservation concern in the state but warranting active monitoring at this time.
P	**Proposed**	A species which has been formally proposed for listing as Endangered, Threatened, or Special Concern, but has not yet completed the legally mandated listing process.

United States Status		**Description**
E	**Endangered**	A taxon "which is in danger of extinction throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
T	**Threatened**	A taxon "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
C1	**Candidate 1**	"Taxa for which the [Fish and Wildlife] Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened. Development and publication of proposed rules on these taxa are anticipated; however, because of the large number of Category 1 taxa, it will take several years to clear the backlog."
C2	**Candidate 2**	"Taxa for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals at this time... Further biological research and field study usually will be necessary to ascertain the status of

		[these taxa]... It is likely that some category 2 candidates will not warrant listing, while others will be found to be in greater danger of extinction than some taxa in category 1."
3A	**Candidate 3a**	"Taxa for which the Fish and Wildlife Service has persuasive evidence of extinction. If rediscovered, such taxa might acquire high priority for listing."
3B	**Candidate 3b**	"Names that, on the basis of current taxonomic understanding ... do not represent distinct taxa..."
3C	**Candidate 3c**	"Taxa that have proven to be more abundant or widespread than previously believed and/or those that are not subject to any identifiable threat. If further research or changes in habitat indicate a significant decline in any of these taxa, they may be reevaluated for possible inclusion in categories 1 or 2.
P	**Proposed**	"Taxa already proposed to be listed as" endangered or threatened. Taxa formally proposed as endangered or threatened receive some legal protection. Species listed as proposed candidates are species which are in the process of being added to the federal candidate list.
*	**Possibly Extinct**	Taxa with no known extant occurrences.