TRANSPORTATION
PLANNING BRANCH

North Carolina
Department of
Transportation

Thoroughfare Plan

July 2003

Stanly County Thoroughfare Plan

Prepared by the:

Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

In cooperation with:

Stanly County
The Federal Highway Administration
U.S. Department of Transportation

July, 2003

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Executive Summary

This plan documents the findings of a thoroughfare plan study for Stanly County. Below is a listing and brief description of these findings. A more detailed discussion of these recommendations can be found in Chapter 2.

Principal Arterials

US 52

TIP Project R-2320. Widen to multi-lanes from NC 24-27 in Albemarle to the Anson County Line.

TIP Project R-2903. Construct a multi-lane facility from Richfield to I-85.

Minor Arterials

NC 24/27

TIP Project R-2530. Upgrade roadway to a multilane facility from the Albemarle City Limits to the Montgomery County Line.

TIP Project R-967. Upgrade roadway to a multilane facility from the Albemarle City Limits to the Locust Town Limits.

Major Collectors

NC 73

TIP Project R-2533. Construct a multilane facility from the Yadkin River to the Cabarrus County Line.

NC 200

Widen to 2-12 foot lanes from the Locust Planning Boundary to the Cabarrus County Line.

NC 138

Widen to 2-12 foot lanes from The Albemarle Urban Planning Boundary to SR 1914 (Cooper Road)

Minor Collectors

SR 1110 (Swift Road)

Widen to 2-12 foot lanes from the Oakboro Planning Boundary to SR 1115 (Oak Grove Road).

SR 1115 (Oak Grove Road)

Widen to 2-12 foot lanes from SR 1110 (Swift Road) to NC 24/27.

SR 1134 (Running Creek Road)

Widen to 2-12 foot lanes from Locust Planning Boundary to NC 73.

SR 1134 (Millingport Road)

Widen to 2-12 foot lanes from NC 73 to US 52.

SR 1206 (Five Point Road)

Widen to 2-12 foot lanes from SR 1208 (Barrier Store Road) to SR 1210 (Mission Church Road).

SR 1208 (Barrier Store Road)

Widen to 2-12 foot lanes from SR 1206 (Five Point Road) to the Cabarrus County Line.

SR 1210 (Mission Church Road)

Widen to 2-12 foot lanes from SR 1206 (Five Point Road) to SR 1134 (Running Creek Church Road)

SR 1227 (Ridge Crest Road)

Widen to 2-12 foot lanes from SR 1134 (Running Creek Church Road) to NC 24/27.

SR 1918 (Cottonville Road)

Widen to 2-12 foot lanes from SR 1935 (Plank Road) to SR 1922 (Stanly School Road).

SR 1935 (Plank Road)

Widen to 2-12 foot lanes from SR 1918 (Cottonville Road) to NC 138.

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Chapter 1
Introduction

Overview

Officials of Stanly County, prompted by a desire to adequately plan for future transportation needs, requested the North Carolina Department of Transportation's (NCDOT) assistance in conducting a thoroughfare plan study.

The objective of thoroughfare planning is to enable a transportation system to be progressively developed to adequately meet the transportation needs of a community, or region, as land develops and traffic volumes increase. It is essential to plan now for future transportation needs in order to avoid unnecessary costs to the physical, social, and economic environment. Thoroughfare planning is a tool that can be used by local officials to plan for future transportation needs, while at the same time reducing costs to our environment.

The primary purpose of this report is to present the findings and recommendations of the thoroughfare plan study conducted for Stanly County. The secondary purpose of this report is to document the basic thoroughfare planning principles and procedures used in developing these recommendations. This report can be divided into three parts. The first part of the report, covered in Chapter 1, covers the highlights of the study. Chapters 2 and 3 provide a detailed description of the thoroughfare plan study recommendations and address different methods by which these recommendations can be implemented. The final chapter, Chapter 4, covers study procedures and details findings.

Information that will be especially useful to the practitioners is provided in the Appendices. The principles of thoroughfare planning are covered in Appendix A. A detailed tabulation of all routes on the thoroughfare plan and a graphical representation of typical cross sections can be found in Appendices B and C, respectively. Information related to subdivision ordinances is covered in Appendix D. Appendix E provides an index for secondary road numbers for Stanly County. Finally, Appendix F addresses the process of requesting Transportation Improvement Program Projects.

Background

Stanly County is located in the central section of the State and is adjoined by Cabarrus, Rowan, Montgomery, Davidson, Union and Anson Counties. Stanly County has a total area of 958 square miles, with 827 square miles of land area. Stanly County is a part of a rural planning organization that consist of Stanly, Anson and Union Counties. Together these three counties make up the Rocky River RPO. The geographic location for Stanly County is shown in Figure 1.

Stanly County was originally part of New Hanover County. Later it was known as a part of Montgomery County. In 1841, the General Assembly created Stanly County. The city of Albemarle was incorporated in 1857 and serves as the county seat. There are eight incorporated communities in Stanly County which includes: Albemarle, Locust, New London, Norwood, Oakboro, Richfield, and Stanfield.

Land use in the county is primarily a mixture of agricultural, commercial, and residential development, with the majority of commercial development being in and around the county's incorporated municipalities.

The major routes in Stanly County include US 52, NC 8, NC 24, NC 27, NC 49, NC 73, NC 138, NC 200, NC 205, NC 731, NC 740, NC 742, and SR 1140 (Running Creek Road/Millingport Road.

Highlights

Major highlights of the 2002 Stanly County Thoroughfare Plan are outlined below. The Thoroughfare Plan is shown in Figure 2 and the Recommended Improvements are shown in Figure 3. Projects included in the 2002-2008 Transportation Improvement Program (TIP) are shown in parenthesis.

- **US 52 (R-2320 R-2903)**
  Widen roadway to a four-lane divided facility from NC 24-27 in Albemarle to Anson County. This is shown in the TIP as R-2320. This will provide the county with a multilane facility for travel to and from the southern portion of the county. Also construct a four lane divided facility (R-2903) from Richfield to I-85 in Salisbury. This project will complete the multilane facility for travel in northern portion of the county and serve as the only multilaned principal arterial allowing access to I-85.

- **NC 73 (R-2410)**
  Provide a multilane facility from the City of Albemarle to the City of Concord. This is TIP project R-2410. The project will connect the traffic in the mid-western region of the county with a direct connection to Concord.

- **NC 49 (R-2533)**
  Construct a multilane facility from the Yadkin River to the Cabarrus County Line. This is TIP project R-2533.

- **NC 24-27 (R-2530, R-967)**
  Upgrade roadway to a multilane facility from City of Albemarle to the Montgomery County Line. This is TIP project R-2530. Also upgrade roadway to a multilane facility from the Town of Locust to the City of Albemarle. This is project R-967 in the 2002-2008 TIP.

- **Widen the following facilities to provide 2-12 ft lanes:**
  NC 200
  SR 1110 (Swift Road)
  SR 1115 (Oak Grove Road)
  SR 1134 (Running Creek Church Road)
  SR 1206 (Five Point Road)
  SR 1208 (Barrier Store Road)
  SR 1210 (Mission Church Road)
  SR 1227 (Ridge Crest Road)

SR 1918 (Cottonville Road)
SR 1922 (Stanly School Road)
SR 1923 (Stanly School Road)
SR 1935 (Plank Road)

The North Carolina Department of Transportation and Stanly County are jointly responsible for the proposed thoroughfare improvements. Cooperation between the State and the County is of primary concern if the recommendations outlined above are to be successfully implemented. All parties have mutually adopted the thoroughfare plan, and it is the responsibility of the County to implement the plan following the guidelines set forth in Chapter 3. This plan was adopted by Stanly County on March 10, 2003 and the Rocky River RPO endorsed the plan on May 29, 2003. The plan was then adopted by the North Carolina Department of Transportation on July 10, 2003.

It is important to note that the recommended plan is based on anticipated growth of the county as indicated by past trends and future projections. Prior to construction of projects proposed herein, a more detailed study will be required to reconsider development trends and to determine specific locations and design requirements, which include the number of lanes.

GEOGRAPHIC LOCATION FOR STANLY COUNTY NORTH CAROLINA

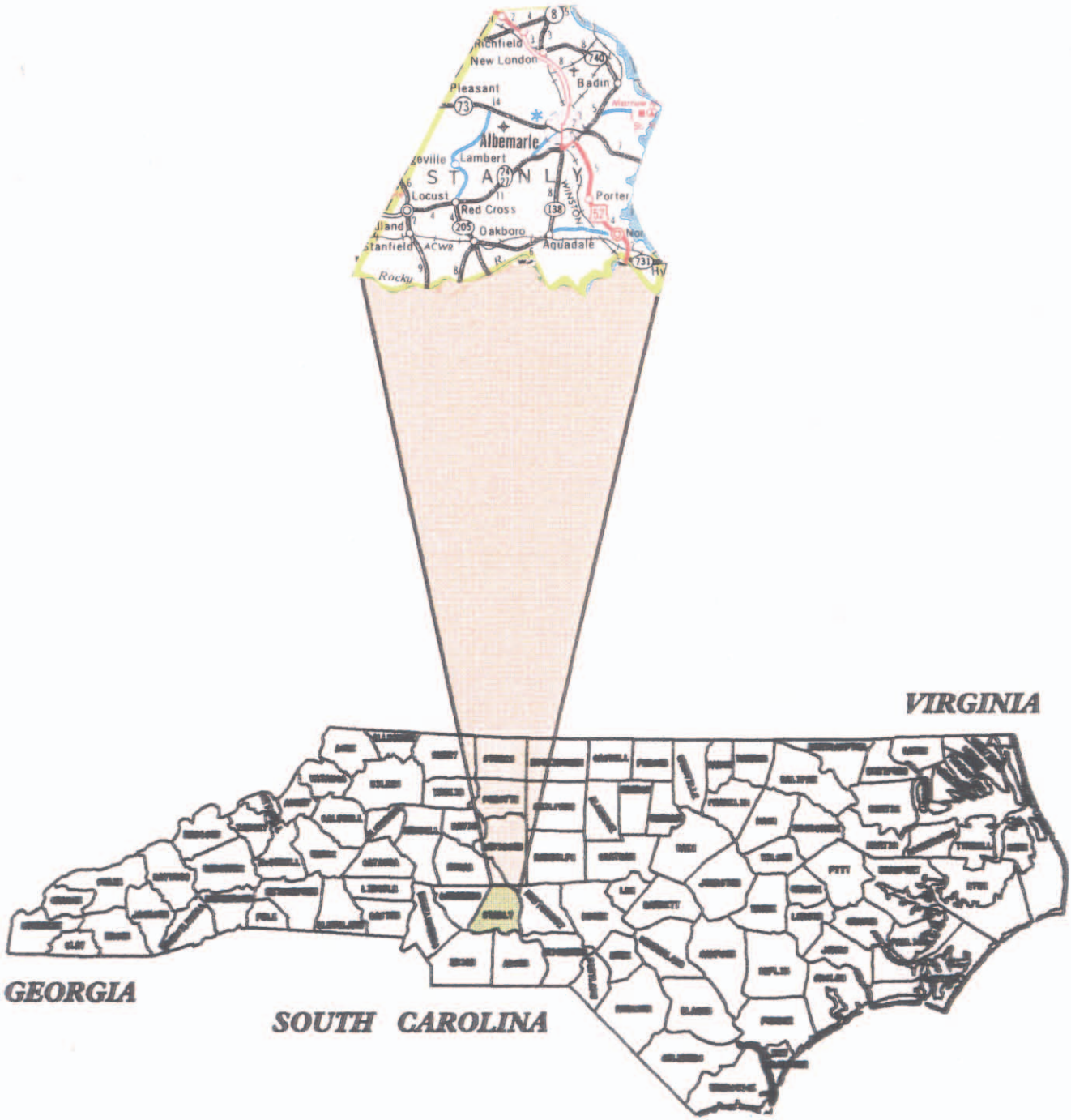
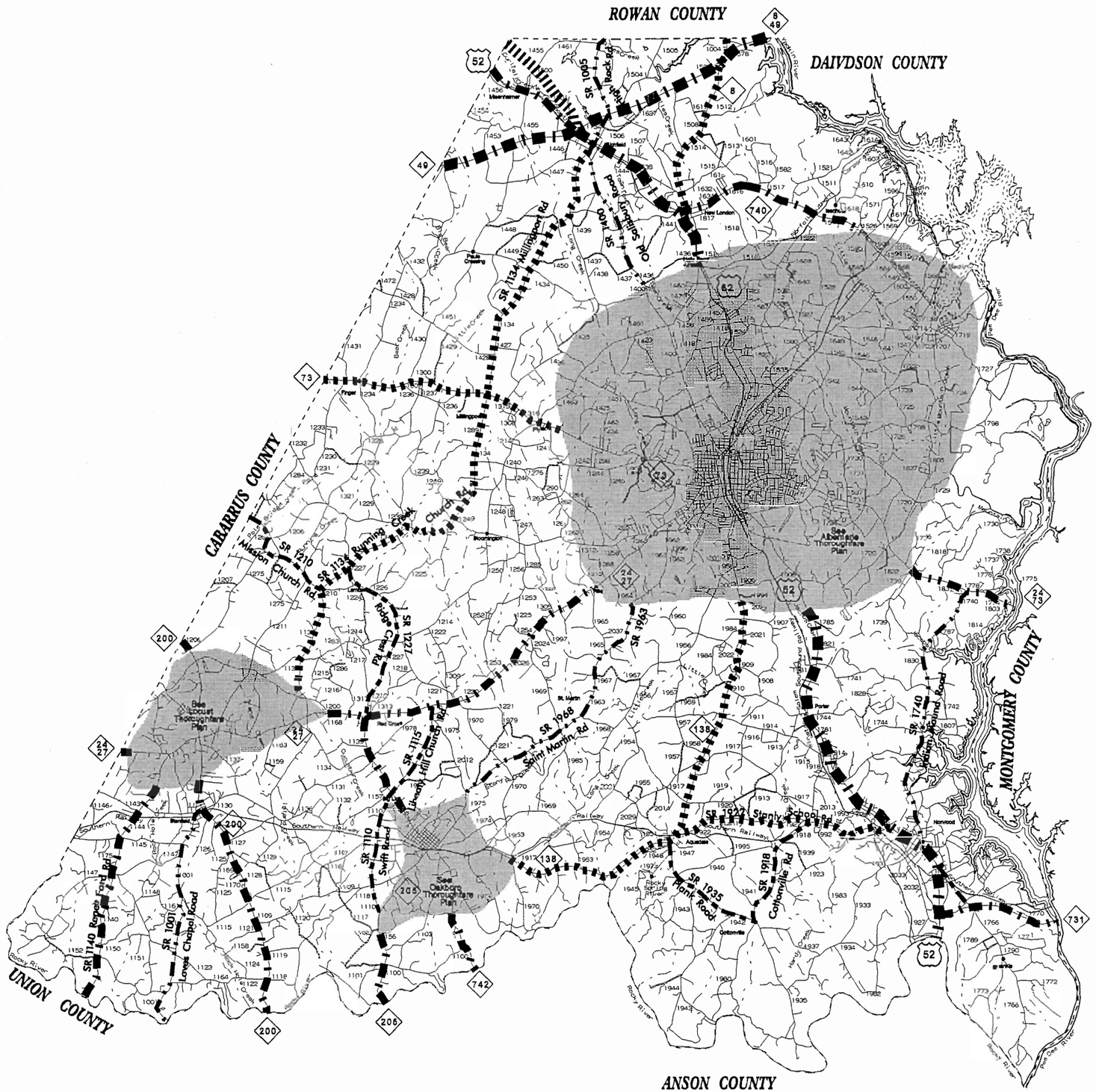


FIGURE 1



THOROUGHFARE PLAN

JANUARY 13, 2003

LEGEND

	EXISTING	PROPOSED
INTERSTATE		
PRINCIPAL ARTERIAL		
MINOR ARTERIAL		
MAJOR COLLECTOR		
MINOR COLLECTOR		

URBAN PLANNING BOUNDARY

ADOPTED BY:

STANLY COUNTY	MARCH 3, 2003
Rocky River RPO	MAY 29, 2003
RECOMMENDED BY: STATEWIDE PLANNING BRANCH	JUNE 4, 2003
N.C. DEPARTMENT OF TRANSPORTATION	JULY 10, 2003

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STANLY COUNTY
NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

U.S.DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4 Miles

Base Map Data: March 19, 2002

FIGURE 2

RECOMMENDATIONS

LEGEND

- WIDEN TO 12 FT LANES
- MULTILANE
- MULTILANE NEW LOCATION
- UPGRADE INTERSECTION
- PLANNING BOUNDARY

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NORTH CAROLINA

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IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4 Miles

Base Map Date: March 10, 2002

FIGURE 3

RECOMMENDATIONS

LEGEND

- WIDEN TO 12 FT LANES
- MULTILANE
- MULTILANE NEW LOCATION
- UPGRADE INTERSECTION
- PLANNING BOUNDARY

N

S

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4 Miles

Base Map Date: March 10, 2002

FIGURE 3

Chapter 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 cannot easily reach their intended destination, goods cannot 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, increased automobile ownership, and increased migration away from the central cities and towns are taxing existing transportation systems and requiring that more emphasis be placed on planning for our transportation future.

A thoroughfare plan study 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 street 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 of Stanly 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.

Thoroughfare Plan Recommendations

The process of developing and evaluating thoroughfare plan recommendations involves many considerations, including the goals and objectives of the area, identified roadway deficiencies, environmental impacts, existing and anticipated land development, and travel services. Chapter 4 contains the documentation of the analysis involved in developing the recommendations for Stanly County. A detailed description of the purpose and need for the recommended improvements that were cooperatively developed are given below. Refer to Figure 3 for a depiction of the recommendations.

Major Thoroughfares

US 52 – Purpose and Need

- **Project Recommendation:** It is recommended that US 52 be upgraded to a four-lane divided facility (R-2320). The project area in Stanly County goes from NC 24-27 in the city of Albemarle to the Anson County line and will connect to US 74 in Anson County. The intersection of US 52 and Fork Road (SR 1766) at the Food Lion in the town of Norwood should be included in R-2320 as an upgrade project to improve safety. The project (R-2320) is scheduled in the post years and connects to the Albemarle Thoroughfare Plan improvement project (R-2320G).

- **Transportation Demand:** US 52 from the Cabarrus County line to the Anson County line is functionally classified as principal arterial. It serves the county as a connector for traffic leaving Albemarle to the north and south. The southern roadway is the main route connecting the town of Norwood to the central part of the county. US 52 serves as the main connector to NC 24-27 east-west traffic that wishes to connect to the city of Charlotte. The southern portion connects the city of Albemarle to the town of Norwood and allows access to Anson County. With the ongoing improvements of NC 24-27 more traffic will utilize US 52 to get to the city of Charlotte. With the land use plan adopted by Stanly County in 2002 the cities projected growth in a hometown pattern containing a centralized business district. The majority of the employment will continue to be in the central portion of the county or toward the Charlotte area, resulting in an increasing traffic flow.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on US 52 ranges from 7,800 vehicles per day (vpd) to 1,200 (vpd). The current capacity ranges from 8,200 (vpd) to 5,000 (vpd). The current level of service (LOS) for US 52 ranges are B-D. (Refer to Chapter 4 for an explanation of level of service). Without improvements the level of service by 2030 will deteriorate to C-E ranges.

- **Social and Economic Development:** US 52 carries traffic north-south through the city of Albemarle and the towns of New London, Norwood, and Richfield. The main industrial development lies in the northern section of Stanly County adjacent to US 52. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. The current land use plan for Stanly County adopted in 2002 maintains the industrial zones in their current location. The land use plans recommends the local retail development stay in the main business districts of the existing municipalities. The concept of strip mall development outside the down town business district will not be allowed. With the continued growth of the industrial parks the traffic volumes will increase the need for better roadways. .

- **Safety Issues:** The southern portion of US 52 connects the town of Norwood to the central portion of the county. Adding additional lanes will increase the safety for the area because large trucks must use US 52 when leaving US 74 heading northward. Traffic uses US 52 get to NC 731 for recreational use along the Montgomery County line, which increase the number of left turn accidents. The recommended improvements will relieve congestion, increase capacity, improve maneuverability, and add more control access, resulting in safer driving conditions.

- **System Linkage:** US 52 has been designated as part of the National Highway System (NHS), which includes roadways that serve major population centers, intermodal transportation facilities, national defense, and interstate and interregional travel. US 52 is classified as one of the other principal arterials in the NHS. The NHS comprises only 4 percent of the road network in the nation, but carries over 40 percent of total vehicle miles of travel (vmt) and 70 percent of truck traffic.

- **Project Recommendation:** A four-lane divided facility on new location will go from Richfield to I-85 in Salisbury. The facility will be a partially controlled access facility (R-2903).

- **Transportation Demand:** US 52 from the Cabarrus County line to the Anson County line is functionally classified as principal arterial. It serves the county as a connector for traffic leaving the city of Albemarle to the north and south. The northern roadway is in one of the leading industrial zones in the county. It serves as a connector for traffic going to city of Concord and Salisbury. The southern portion connects the city of Albemarle to the town of Norwood and allows access to Anson County. This project will help with the increased traffic from the improvements made from TIP project R-2320. Upon completion of the projects there will be a direct link to I-85 from US 74.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on the northern part US 52 ranges from 13,500 vehicles per day (vpd) to 6,200 (vpd). The current capacity ranges from 8,800 (vpd) to 5,000 (vpd). US 52 is currently working from a level of service (LOS) B to D. (Refer to Chapter 4 for an explanation of level of service). Without any improvements the level of service by 2030 will deteriorate to C to E.

- **Social and Economic Development:** US 52 carries traffic north-south through the city of Albemarle and the towns of New London, Norwood, and Richfield. The main industrial development lies in the northern section of Stanly County adjacent to US 52. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. The current land use plan for Stanly County was adopted in 2002. The plan will continue to hold all the industrial zones in their current location. The land use plan continues to maintain the local commercial development in the main business districts of the existing municipalities. With the continued growth of the industrial parks the traffic volumes will increase. The improvements of US 52 into Cabarrus County will complete the connection to I-85 from traffic leaving US 74 in Anson County. These improvements will increase the commercial and residential growth of the county.

- **Safety Issues:** The northern portion of US 52 enables the county to connect to I-85 and the cities of Concord and Kannapolis. Adding additional lanes will increase the safety for the area because of the large truck usage of US 52 when leaving US 74 heading northward to I-85. Traffic from the manufactured products include large modular homes that must pull onto US 52 at a slower speed while occupying wide portions of the roadway, which increases the possibility of accidents. The recommended improvements will relieve congestion, increase capacity, improve maneuverability, and add more control access, resulting in safer driving conditions.

- **System Linkage:** US 52 has been designated as part of the National Highway System (NHS), which includes roadways that serve major population centers, intermodal transportation facilities, national defense, and interstate and interregional travel. US 52 is classified as one of the other principal arterials in the NHS. The NHS comprises only 4 percent of the road network in the nation, but carries over 40 percent of total vehicle miles of travel (vmt) and 70 percent of truck traffic. US 52 intersects with NC 49 which is also a part of the NHS.

NC 73 – Purpose and Need

- **Project Recommendation:** The project goes from the city of Albemarle to the Cabarrus County Line. The project will connect with the Albemarle Thoroughfare Plan. The city recommendations provide for a multilane facility. This project is currently unfunded.

- **Transportation Demand:** NC 73 from the Cabarrus County line to the Albemarle city limit is functionally classified as a major collector. It serves the county as a connector for traffic leaving the city of Albemarle to the east and west. The eastern route is shared with NC 24, which is recommended for improvements to a multi-lane facility as TIP project R-2530. The western roadway consists of rural farmland and has an emergency medical and fire facility in the Millingport community at SR 1134 (Millingport Road) intersection. It serves as a connector for traffic going to the cities of Concord and Charlotte. This project will help with the increase traffic from the improvements made from TIP project R-2530, which improves NC 24-73 on the east side of the city of Albemarle.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on the western part of NC 73 is 6,400 vehicles per day. The current capacity is 8,600 (vpd). The current level of service for NC 73 is in the B-D range (Refer to Chapter 4 for an explanation of level of service). By the year 2030 the traffic is projected to be 11,000 (vpd). Without any improvements the level of service by 2030 will deteriorate to C-E range.

- **Social and Economic Development:** NC 73 carries traffic east-west through the city of Albemarle. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. The current land use plan for Stanly County was adopted in 2002 and will continue to designate the land between the cities of Albemarle and Concord as rural farmland. Farm machinery uses the roads to get to adjacent fields. The machinery is often wide and travels at a slow pace along existing narrow lanes. With the continued growth of the Concord area and Stanly County's close proximity to the city of Charlotte the local residential areas are growing. New schools have been built along the western area of Stanly County to handle the new growth. This growth will increase the retail business in the county and the traffic volumes.

- **Safety Issues:** The western portion of NC 73 serves as a direct connection from the city of Albemarle to the city of Concord. Adding additional lanes will increase the safety for the area because large slow moving farm equipment uses the road. The area between Albemarle and Cabarrus County is designated as rural farmland. With the growth of Charlotte and Concord areas, many cars will travel NC 73 to and from work. With additional lanes on NC 73, left turns and the ability to pass large farm equipment will result in safer driving conditions.

- **System Linkage:** Improving NC 73 to a multi-lane facility is imperative because of its significance in serving intracounty travel and traffic generators in addition to providing access to the arterial system. It plays an important role in providing east-west passage for the central part of Stanly County.

NC 49 – Purpose and Need

- **Project Recommendation:** The project goes from the town of Harrisburg in Cabarrus County to the Yadkin River for a total length of 29.3 miles. The project will connect Stanly County with the Charlotte and Harrisburg area. The TIP project (R-2533) will provide multi-lanes along NC 49 in the northern portion of Stanly County.

- **Transportation Demand:** NC 49 is functionally classified as major collector. It serves the northern part of the county allowing an east-west traffic flow from Davidson County to the Cabarrus County. NC 49 is a part of the National Highway System, which is recommended for improvements to a multi-lane facility as TIP project R-2533. Because NC 49 serves a direct link to the Charlotte area for the northern part of the county, it will serve the county as well as through traffic from the counties north east of Stanly County. The project will help with the increased traffic from the rapid growth of the Charlotte and Concord area.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on the western part of NC 49 is 7,000 vehicles per day (vpd) with the eastern portion at 4,000 (vpd). The current capacity is 5,000 (vpd). The current level of service (LOS) for NC 73 if between the B-D range. (Refer to Chapter 4 for an explanation of level of service). By the year 2030 the traffic is projected to be 8,500 (vpd). Without improvements the level of service by 2030 will deteriorate to C-E range..

- **Social and Economic Development:** NC 49 carries traffic east-west just north of the city of Albemarle. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. NC 49 is a vital link for the county because of the constraints on the east-west traffic flow created by the Uwharrie National Forest and the Morrow Mountain State Park area. NC 49 serves and the main east-west route from the city of Asheboro to the city of Charlotte south of I-85. The current land use plan for Stanly County was adopted in 2002 and will continue to designate the land as rural farmland for the areas east and west of US 52. The improvements on US 52 from TIP project R-2093 combined with the continued growth of the Concord area and Stanly County's close proximity to the Charlotte promotes residential growth for these areas. This growth will increase the potential need for retail goods and services in the county and the traffic volumes along NC 49.

- **Safety Issues:** NC 49 serves as a direct connection from the city of Asheboro to the Charlotte area. Adding additional lanes will increase the safety for the area. Large slow moving farm equipment currently uses the road. The current road does not provide safe areas for the equipment to pull off or areas for motorist to pass. The area between Davidson County and Cabarrus County has a recreational water use facility which increases recreational vehicles utilizing the water access points. With the manufactured housing industry along US 52 near the Richfield area larger and more restricting traffic uses NC 49. Combined with the growth of the Charlotte and Concord area many of the county residents commute to the jobs in the more

urbanized areas. Many cars will travel NC 49 to and from work. With additional lanes on NC 49, left turns and the ability to pass large equipment can be done with increased safety.

- **System Linkage:** Improving NC 49 to a multi-lane facility is imperative because of its significance in serving intracounty travel and traffic generators in addition to providing access to the arterial system. It plays an important role in providing east-west passage for the northern part of Stanly County. NC 49 is a part of the National Highway System (NHS) which includes roadways that serve major population centers, intermodal transportation facilities, national defense, and interstate and interregional travel. NC 43 is classified as one of the other principal arterials in the NHS. The NHS comprises only 4 percent of the road network in the nation, but carries over 40 percent of total vehicle miles of travel (vmt) and 70 percent of truck traffic.

NC 24-27 Purpose and Need

- **Project Recommendation:** The project goes from the west city limits of Locust to the west city limits of Albemarle for a total length of 14.2 miles. The project will improve the traffic flow form Stanly County with the city of Charlotte with a multi-lane road. The project is listed in the TIP as project (R-967) which is a part of the intrastate projects proposed throughout the state.

- **Transportation Demand:** NC 24-27 is functionally classified as a minor arterial. It serves Stanly County as an east-west connection between Montgomery County and Cabarrus County. NC 24-27 intersects I-74 in Montgomery County, which makes easy access to the I-40 and I-85 in the north and the Charlotte area in the southwest.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on the western part of NC 24/27 is 11,600 vehicles per day. The current capacity is 5,300 (vpd). The current level of service (LOS) for NC 24/27 is within the B to D range. (Refer to Chapter 4 for an explanation of level of service). By the year 2030 the traffic is projected to be 12,000 (vpd). Without improvements the level of service by 2030 will deteriorate to C-E range.

- **Social and Economic Development:** NC 24/27 carries traffic east-west through the city of Albemarle. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. NC 24/27 is a vital link for the east-west traffic traveling from the City of Albemarle to the Charlotte area. The current land use plan for Stanly County was adopted in 2002 and will continue to designate the land as rural farmland outside of the City of Albemarle to the Cabarrus County Line. The western section of the county is expected to increase in residential development. With much of this area designated as rural farmland in the Stanly County Land Use Plan in 2000 travel will be required to get to retail goods and services. The residents will need to commute to their places of employment. The growth will increase the traffic volumes.

- **Safety Issues:** The NC 24/27 serves as an east-west facility for the county. Adding additional lanes will increase the safety for the area because of the commuters traveling to surrounding areas for employment. Combined with the growth of the city of Albemarle and the completed

portions of multi-lane sections of NC 24/27 it is essential to establish some uniformity in the road. With the combination of TIP project R-2530 and R-967 the road will have multi-lanes throughout the county and should reduce accidents by providing safe storage for vehicles making left and right turns.

- **System Linkage:** Improving NC 24/27 to a multi-lane facility will provide the central portion of Stanly County with an important east-west passage. Providing a good intrastate road system allows neighboring counties and Stanly County safe and convenient travel.

- **Project Recommendation:** Upgrade NC 24-27 (R-2530) to a multilane facility from west of the city of Albemarle to a point west the Pee Dee River. This is TIP Project R-2530. Upon completion the TIP project will be 8.9 miles in length.
- **Transportation Demand:** NC 24/27 is functionally classified as a minor arterial. It serves the central part of the county allowing an east-west traffic flow from Montgomery County to Cabarrus County. NC 24 intersects I-74 in Montgomery County, which makes easy access to the I-40 and I-85.

- **Roadway Capacity and Deficiencies:** The current average daily traffic (ADT) on the western part of NC 24/27 is 8,000 vehicles per day. The current capacity is 5,300 (vpd). The level of service(LOS) for NC 24/27 is in the B-D range. (Refer to Chapter 4 for an explanation of level of service). By the year 2030 the traffic is projected to be 9,000 (vpd). Without improvements the level of service by 2030 will deteriorate to the C-E range.

- **Social and Economic Development:** NC 24/27 carries traffic east-west through the city of Albemarle. Since much of the outlying area is rural, this route is important for access to shopping and business for residents and outlying communities. NC 24/27 is a vital link for the counties east-west travelers on the southern end of the Uwharrie National Forest and the Morrow Mountain State Park area. NC 24/27 services a major retail area for the city of Albemarle. The current land use plan for Stanly County was adopted in 2002 and will continue to designate the land as rural farmland outside of the city of Albemarle to the Montgomery County Line. The retail centers shall remain in their current location from the eastern city limit and continue west beyond the intersection of US 52. With the continued growth of commercial centers and retail businesses on NC 24/27 accessibility and provisions for through traffic are essential for continued growth.

- **Safety Issues:** The NC 24/27 serves as an east-west facility for the county. Adding additional lanes will increase the safety for the area by increasing the accessibility in areas of high concentration of commercial and retail establishments along the road. Combined with the growth of the Albemarle area and the completed portions of multi-lane sections of NC 24/27 it is essential to establish some uniformity in the road. With the combination of TIP project R-2530 and R-967 the road will have multi-lanes throughout the county and should reduce accidents by providing safe storage for vehicles making left and right turns.

- **System Linkage:** Improving NC 24/27 to a multi-lane facility will provide the central portion of Stanly County with an important east-west passage. Providing a good intrastate road system allows neighboring counties and Stanly County safe and convenient travel.

Widening Projects

The following facilities are recommended to be widened to improve safety and capacity. Each of the sections of roadway listed below currently has lane widths less than 12 feet. Based on the volume of traffic on the road widening is recommended. Before any roadway improvements are made, Especially to roads that are part of the NC Bike Route system, the NCDOT Division of Bicycle and Pedestrian Transportation should be consulted on the most appropriate cross section.

- **NC 200:** From Cabarrus County to Union County
- **NC 138:** From the Albemarle Planning Boundary to SR 1914 (Cooper Road).
- **SR 1134 (Milling Port Road/Running Church Road):** From NC 8/49 to the UPB of the town of Locust.
- **SR 1110 (Swift Road):** From SR 1227 (Ridge Crest Road) to the UPB of the town of Oakboro.
- **SR 1115 (Liberty Hill):** From SR 1227 (Ridge Crest Road) to NC 24/27.
- **SR 1206 (Mission Church Road):** From SR 1206 (Five Point Road) to SR 1134 (Running Creek Church Road)
- **SR 1208 (Barrier Store Road):** From SR 1206 (Five Point Road) to Cabarrus County line.
- **SR 1210 (Mission Church Road):** From SR 1134 (Running Creek Church Road) to SR1206 (Five Point Road).
- **SR 1227 (Ridge Crest Road):** From SR 1134 (Running Creek Church Road) to NC 24/27.
- **SR 1918 (Cottonville Road):** From SR 1935 (Plank Road) to SR 1922 (Stanly School Road).
- **SR 1922 (Stanly School Road):** From SR 1923 (Stanly School Road) to NC 138.
- **SR 1923 (Stanly School Road):** From SR 1922 (Stanly School Road) to US 52.
- **SR 1935 (Plank Road):** From NC 138 to SR 1918 (Cottonville Road).

Bicycle Routes

Stanly County has three signed county bicycle routes and two cross-state routes (Gold Fever NC Bike Route which is part of the Piedmont Spur, the Sandhills Sector) and a series of unsigned facility that total 197-miles system. Because of this designation, these facilities may be subjected to more bicycle traffic than other facilities of similar design. Due to the shared, or multi-modal, use of these facilities, it is recommended that sub-standard sections be widened to a standard cross section for bicycles (Appendix C, cross section O) as funding permits. These improvements will enhance safety and the functional design of the facility. The bicycle routes, described below, are shown in Figure 4.

***Gold Fever* (NC Bike Route B-4) and Sandhills Sector**

NC 24/27/73 from Motgomery County Line to SR 1720 (Valley Drive)

SR 1720 (Valley Drive) from NC 24/27/73 to SR 1730 (Vickers Store Road)

SR 1730 (Vickers Store Road) From SR 1720 (Valley Drive) to NC 740

NC 740 from SR 1730 (Vickers Store Road) to the eastern Albemarle Urban Planning Boundary.

NC 73 from Western Albemarle Planning boundary to SR1249 (Canton Road)

SR 1249 (Canton Road) from NC 73 to SR 1134 (Running Creek Church Road)

SR 1134 (Running Creek Church Road) from SR 1249 (Canton Road) to SR 1210 (Substation Road)

SR 1210 (Substation Road) from SR 1249 (Canton Road) to SR 1206 (Mission Church Road)

SR 1206 (Mission Church Road) from SR 1249 (Canton Road) to SR 1208 (Barrier Store Road)

SR 1208 (Barrier Store Road) from SR 1249 (Canton Road) to Cabarrus County Line

The Department of Transportation and the Albemarle Parks and Recreation Department has produced a map that includes several connecting bike routes within the county. The map includes the services available for the bicyclist on both signed and unsigned routes within the county. The map is included in the Thoroughfare Report for the City of Albemarle for the year 2000. The map is available through Bicycle and Ped. Division of the North Carolina Department of Transportation

.

When considering the widening of these facilities, the NCDOT Division of Bicycle and Pedestrian Transportation should be consulted. This division can recommend the most appropriate cross section for the widening, in addition to providing assistance in identifying the need for improvements based on present and future bicycle traffic. For further consideration and assistance, the coordinator of this division can be contacted at the address below.

NC Department of Transportation
Division of Bicycle and Pedestrian Transportation
1552 Mail Service Center
Raleigh, NC 27699-1552

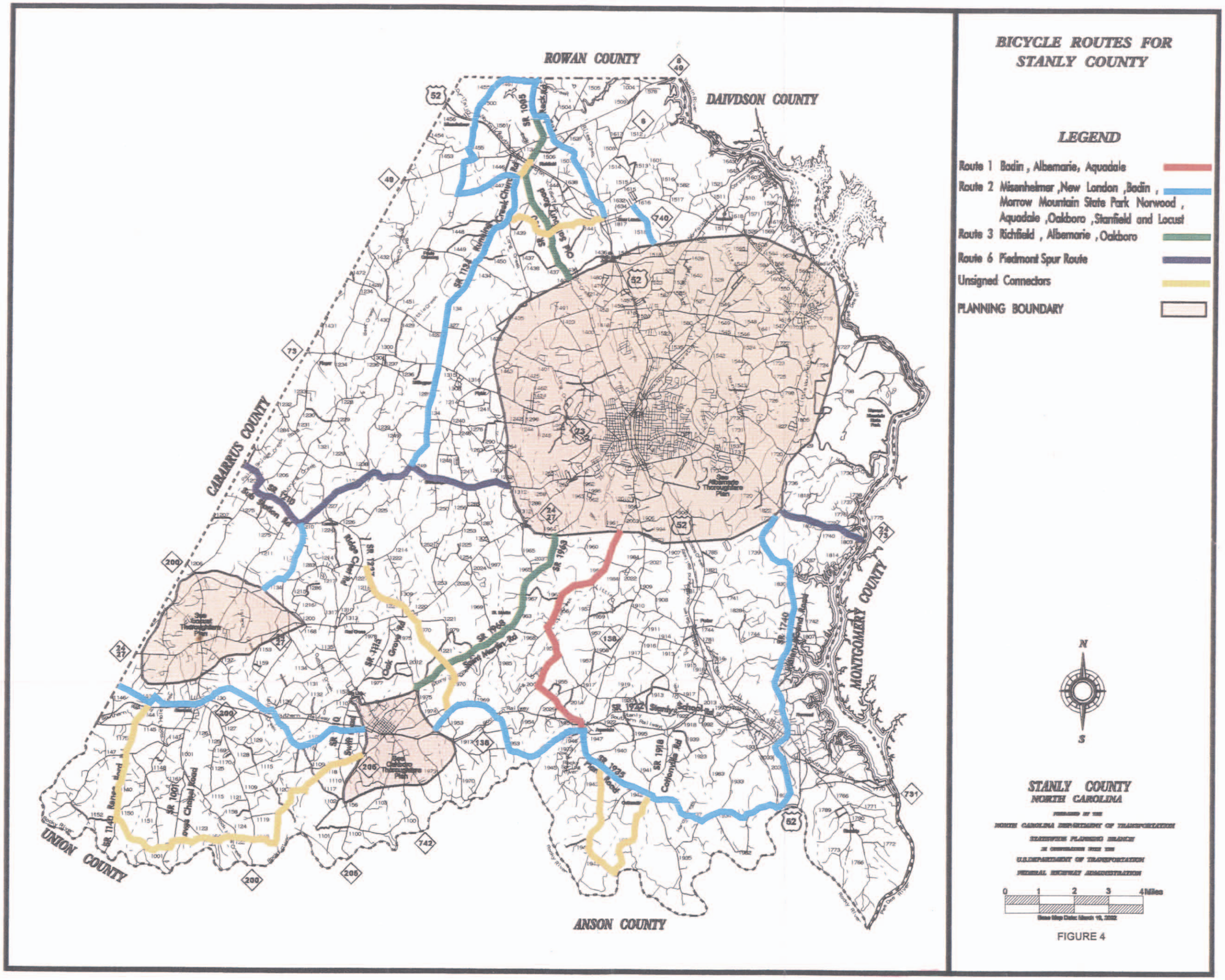

BICYCLE ROUTES FOR
STANLY COUNTY
LEGEND
Route 1 Badin , Albemarle, Aquadale
Route 2 Misenheimer ,New London ,Badin , Morrow Mountain State Park Norwood , Aquadale ,Oakboro ,Stanfield and Locust
Route 3 Richfield , Albemarle ,Oakboro
Route 6 Piedmont Spur Route
Unsigned Connectors
PLANNING BOUNDARY
ROWAN COUNTY
DAIVDSON COUNTY
CARARRUS COUNTY
MONTGOMERY COUNTY
UNION COUNTY
ANSON COUNTY
N
S
STANLY COUNTY
NORTH CAROLINA
0 1 2 3 4 Miles

FIGURE 4

Public Involvement

Based on a request from the Stanly County Board of Commissioners in March of 1996, the study to develop a thoroughfare plan for Stanly County was officially started in April of 2000. NCDOT officials met with the Stanly County Planning Director, and the Planning Board. These meetings were held to present information on the thoroughfare planning process and to gather input on the transportation needs of the County.

The proposed thoroughfare plan was presented to the Stanly County Commissioners at the March 10, 2003 County Commissioners' meeting, with members of the public present. After a public hearing, the County Commissioners adopted the Stanly County Thoroughfare Plan. The Rocky River PRO reviewed the plan and issued a resolution to support the plan on May 29, 2003. The North Carolina Board of Transportation adopted the plan on June 4, 2003.

Chapter 3
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

Stanly County and the North Carolina Department of Transportation (NCDOT) have mutually approved the thoroughfare plan shown in Figure 2. The mutually adopted plan now serves as a guide for the NCDOT in the development of the county transportation system. 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 Planning 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 Ten, which includes Stanly 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.ncdot.org.

Division Ten Engineer's Office
N.C. Department of Transportation
716 W. Main Street
Albemarle, NC 28001

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 Stanly 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 Stanly County Thoroughfare Plan.

Table 1

Funding Sources and Recommended Methods of Implementation								
Projects	**Funding Sources**				**Methods of Implementation**			
	Local Funds	TIP Funds	Industry Access	Small Urban	T-fare Plan	Subdiv. Ord.	Zoning Ord.	Develop. Review
US 52		X			X			X
NC 24/27		X			X			X
NC 49		X			X			X
NC 73		X			X			X

Chapter 4
Analysis of Stanly County'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 Stanly 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 Stanly County:

1. Albemarle 2001
2. Locust 1984*
3. Oakboro 1994

* new study in progress

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 replacement, 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 Stanly County.

1. **US 52**

R-2320: US 74 in Wadesboro to NC 24 –27 in Albemarle four lanes divided with some relocation.

R-2903: Multi-lanes south of NC 49 in Richfield to I-85 North of Salisbury. Four lanes divided on new location (Coordinate with I-2511)

2. **US 52/ US 74/ NC 49**

R-4413: National Highway System guardrail rehabilitation project to upgrade substandard guardrail end treatments and bridge anchor units.

3. **NC 24-27**

R-967: West city limits of Locust to west city limits of Albemarle widen the existing facility to four lanes.

R-2530: Multi-lanes west of Albemarle to multi-lanes west of the Pee Dee River. Widen to Multi-lanes.

4. **NC 49**

U-2533: Harrisburg to Yadkin River widen to multi-lanes.

5. **Bridge Projects**

B-4407: Rocky River, replace bridge No. 70.

B-4643: Curl Tail Creek, replace bridge No. 24.

B-4276: Long Creek replace bridge No. 23.

B-4278: Island Creek replace bridge No. 209.

B-3907: Rock Hole Creek replace bridge No. 135

B-3700: Long Creek replace bridge No. 187.

B-3908: Big Bear Creek replace bridge No. 246.

B-4644: Hardy Creek replace bridge No. 57.

B-4279: Scaly Bark Creek replace bridge No. 120 with culvert.

B-3909: Long Creek replace bridge No. 99.

B-43333: Kingsley Drive over Long Creek replace bridge No. 66.

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 and Figure A-2 depicts Stanly County 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 several locations in Stanly County. The 2000 average daily traffic (ADT) for Stanly County's functionally classified roads is shown in Figure 6 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 2.

Table 2

Minimum Tolerable Lane Widths

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 Stanly 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 Stanly 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 shown in Figure 9 and are listed below.

- NC 8: From NC 49 to US 52
- NC 73: From the Albemarle Urban Planning Boundary to the Cabarrus County Line
- NC 138: From the Oakboro Urban Planning Boundary to the Albemarle Urban Planning Boundary
- NC 740: From NC 8 to SR 1520 (Gurley Road)
- NC 200: From the Oakboro Urban Planning Boundary to the Cabarrus County line
- SR 1110 (Swift Road): From NC 205 to SR 1115 (Liberty Church Road)

- SR 1115 (Liberty Church Road): From SR 1110 (Swift Road) to NC 24/27
- SR 1134: From the Locust Urban Planning Boundary to US 52
- SR 1206 (Five Point Road): From SR 1208 (Barrier Store Road) to SR 1210 (Mission Church Road)
- SR 1208 (Barrier Store Road): From the Cabarrus County Line to SR 1206 (Five Point Road)
- SR 1210 (Mission Church Road): From SR 1206 (Five Point Road) to SR 1134 (Running Creek Church Road)
- SR 1227 (Ridge Crest Road): From SR 1134 (Running Creek Church Road) to NC 224/27
- SR 1918 (Cottonville Road): From SR 1922 (Stanly School Road) to SR 1935 (Plank Road)
- SR 1935 (Plank Road): From SR 1918 (Cottonville Road) to NC 138

Capacity Analysis of the Existing System

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 2000 average daily traffic for facilities in Stanly County are shown in Figure 6 and listed in Appendix B, Table B-1. Currently, the following facility in Stanly County is over capacity:

- US 52: From the Cabarrus County line to the northern Albemarle Urban Planning Boundary (AUPB) and from the southern AUPB to the City of Norwood

- NC 8: From the Davidson County Line to the NC 8/49 split

- NC 49: From the NC 8/49 split to the Cabarrus County Line

- NC 24: Form Locust Urban Planning Boundary (LUPB) to western Albemarle Urban Planning Boundary (AUPB) and from the eastern (AUPB) to the Motgomery County Line

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 5.

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.

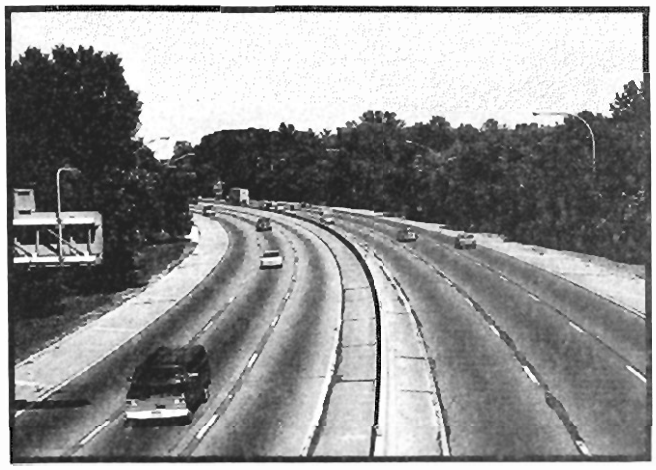
LOS E

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.

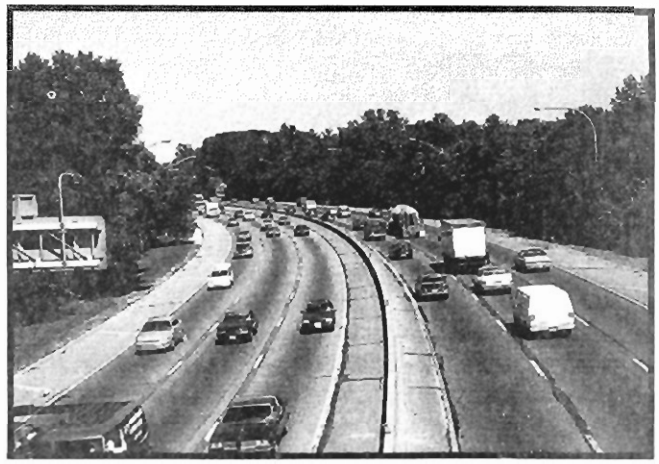
LOS F

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

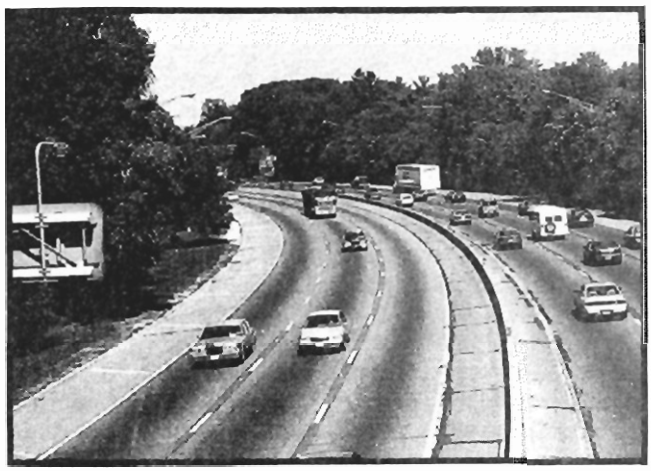
Source: 1994 Highway Capacity Manual



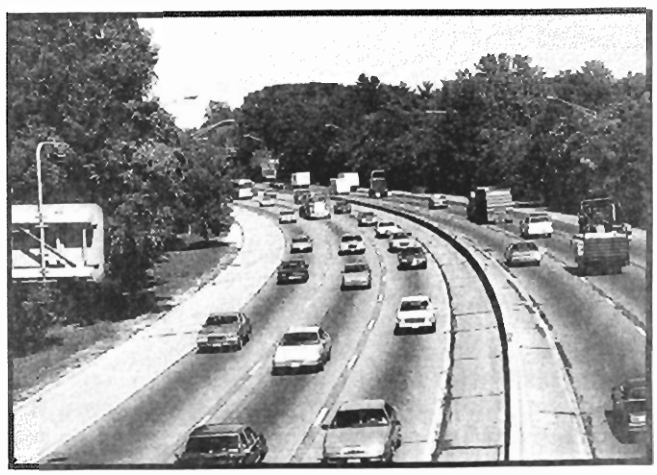
LOS A.



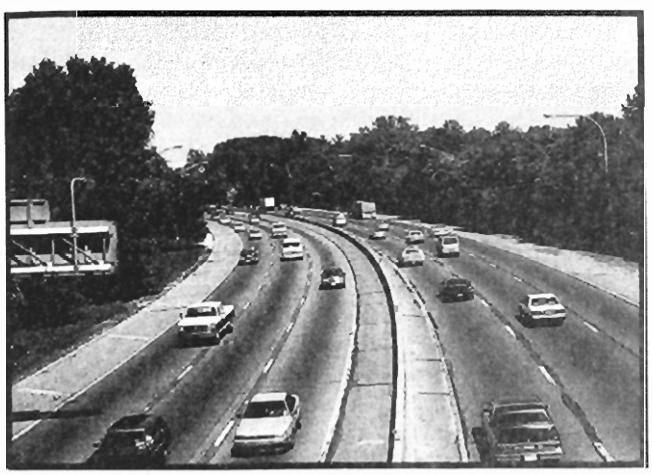
LOS D.



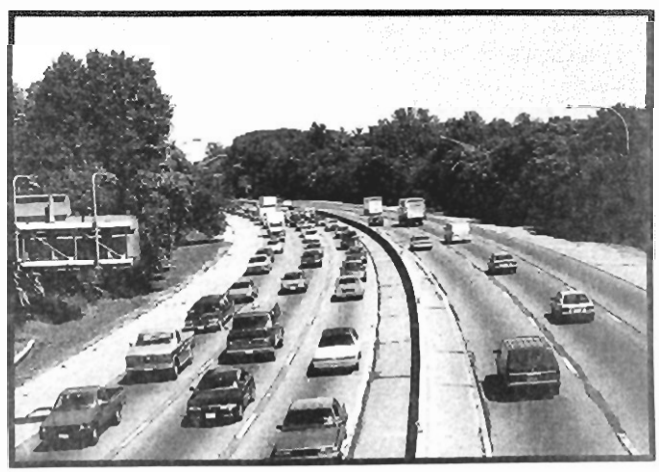
LOS B.



LOS E.



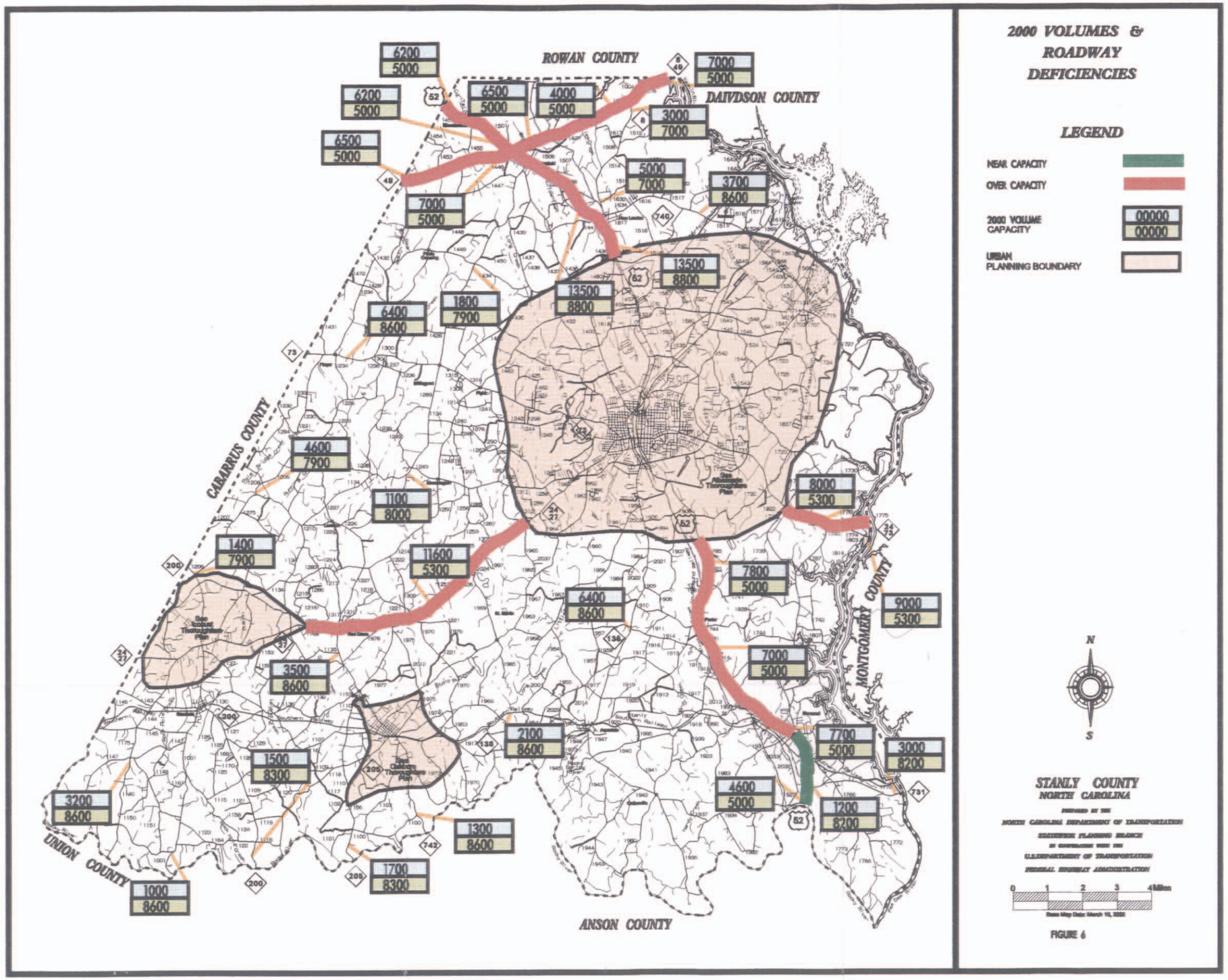
LOS C.



LOS F.

Figure 5

LEVELS OF SERVICE


2000 VOLUMES & ROADWAY DEFICIENCIES
LEGEND
NEAR CAPACITY
OVER CAPACITY
2000 VOLUME
CAPACITY
00000
00000
URBAN
PLANNING BOUNDARY
ROWAN COUNTY
DAVIDSON COUNTY
CABARRUS COUNTY
MONTGOMERY COUNTY
UNION COUNTY
ANSON COUNTY
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STANLY COUNTY
NORTH CAROLINA
0 1 2 3 4 Miles
FIGURE 6

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. 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 Run Off Road Crashes Crossing Pattern Crashes Right Turn Other Modes (Includes pedestrian, bicycle, moped crashes)

Crash data is given by type in order to identify any trends that may be correctable through roadway or intersection improvements. The total number of crashes and the average crash severity are useful for ranking the most problematic intersections. The severity index is based on a series of weighting factors developed by the NCDOT. These factors define a fatal or incapacitating crash as 47.7 times more severe than one involving only property damage, and an crash resulting in minor injury as 11.8 times more severe than one with only property damage. In general, a higher severity index indicates more severe crashes. Listed below are levels of severity for various severity index ranges.

Severity	Severity Index
low	< 6.0
average	6.0 to 7.0
moderate	7.0 to 14.0
high	14.0 to 20.0
very high	> 20.0

Table 3 gives a summary of the intersections in Stanly County with the highest crash rates. For each intersection, the total number of crashes is given by type and by average severity index. The criterion used to identify these locations includes all crashes within 150 feet of an intersection over a three-year period, between January 1998 and December 2000.

To request a more detailed crash analysis for any of the intersections given in Table 3, or other intersections of concern, the appropriate Regional Traffic Engineer, which is the Metrolina Region for Stanly County, should be contacted.

Metrolina Region (Serves Divisions 9, 10, and 11)
Room 112
2327 Tipton Drive
Charlotte, NC 28206
(336) 896-7037
Regional Traffic Engineer
Interim Contact: Vickie L. Embry (Triad & High County Region)

Table 3

Stanly County Highest Crash Intersections

Location Number	Intersection	I-1	I-2	I-3	I-4	I-5	Other	Total	Severity Index
1	NC 200/SR 1115	11					1	12	2.85
2	US 52/NC 49	10				2		12	2.85
3	SR 1918/SR 1922	6				4		10	3.69
4	SR 1214/SR 1400	7					3	10	5.44

Note: * Denotes intersections included in the 2000 Spring Highway Safety Improvement Program.

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 Stanly County have been analyzed, rated, and inventoried. Table 4 shows the all functionally obsolete bridges and Table 5 shows the fifteen most structurally deficient bridges in the county.

Table 4

Functionally Obsolete Bridges in Stanly County				
Bridge No.	Facility Carried	Water Source	Location	Rating
12	SR 1522	LITTLE MONUTAIN CREEK	0.1 MI N JCT SR 1518	60.8
21	NC 73	BIG BEAR CREEK	0.9 MI E JCT. SR 1234	59.1
62	SR 1943	TRIBUTARY OF ROCKY RIVER	0.4 MI N JCT. SR 1980	36.1
78	SR 1228	BIG BEAR CREEK	0.2 MI N JCT. SR 1234	39.3
99*	SR 1968	LONG CREEK	0.4 MI E JCT. SR 1968	48.5
115	SR 1968	STONEY RUN CREEK	0.2 MI E JCT. SR 1975	58.9
125	SR 1130	ISLAND CREEK	0.2 MI E JCT. SR 1127	55.7
135*	NC 99	ROCK HOLE CREEK	0.6 MI W JCT. SR 1001	40.4
156	SR 1218	STONY RUN CREEK	0.7 MI S JCT. SR 1221	39.3
160	SR 1253	RAMSEY CREEK	0.1 MI W JCT. NC 27	44.1
167	SR 1421	TOWN CREEK	0.4 MI N JCT. SR 1400	53.4
208	SR 1001	ROCKY CREEK	0.7 MI S JCT. SR 1152	49.1
246*	SR 1225	BIG BEAR CREEK	1.1 MI S JCT. SR 1134	47.8
258	SR 1103	COLD WATER CREEK	0.2 MI M JCT. SR 1104	36.3

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

Table 5

Fifteen Most Structurally Deficient Bridges in Stanly County				
Bridge No.	Facility Carried	Water Source	Location	Rating
33*	NC 73	LONG CREEK	0.1 MI W JCT SR 1406	7.3
34	SR 1433	BRANCH OF BIG BEAR CREEK	0.8 MI N JCT SR 1434	26.8
42	SR1434	BIG BEAR CREEK	100 FT E JCT SR 1433	40.0
44	SR 1435	LONG CREEK	0.3 MI W JCT SR1438	26.5
51	NC 24/27/73WBL	PEE DEE RIVER	0.1 MI E JCT SR 1803	29.8
57*	SR 1934	HARDY CREEK	0.6 MI W JCT SR 1937	24.6
95	SR 1954	LITTLE LONG CREEK	0.3 MI S JCT SR 1956	39.9
120*	SR 1963	SCALY BARK CREEK	0.6 MI N JCT SR 1964	32.3
138	SR 1109	ISLAND CREEK	0.4 MI E JCT SR 1120	32.5
183	SR 1117	CUCUMBER CREEK	0.2 MI S JCT SR 1115	38.9
187*	SR 1214	LONG CREEK	0.5 MI N JCT SR 1435	23.2
198	SR 1228	RUNNING CREEK	0.8 MI N JCT SR 1210	18.3
209*	SR 1136	ISLAND CREEK	0.3 MI S JCT SR 1153	29.0
215	SR 1542	LITTLE MOUNTAIN CREEK	0.3 MI N JCT SR 1537	33.6
221	SR 1507	CURL TAIL CREEK	50 FT N JCT SR 1506	39.0

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

Factors Affecting the Future Roadway System

The objective of thoroughfare planning is to develop a transportation system that will meet future travel demand and enable people and goods to travel safely and efficiently. To determine the needs of an area it is important to understand the effect of population, economics and land use on the roadway system. Examination of these factors helps to explain historic travel patterns and lays the groundwork for thoroughfare planning.

Population

The amount of traffic on a section of roadway is a function of the size and location of the population that it serves. Investigating past trends in population growth and projecting future population growth and dispersion is an essential step in transportation planning. Table 6 shows the historical trends and projected population for Stanly County through the year 2030. Table 7 shows population trends by township.

Table 6

Stanly County Population Trends and Projections

Year	Population	Percent Growth
1970	42,822	-
1980	48,517	-
1990	51,765	+6.7
2000	58,100	+12.2
2010	64,281[a]	+10.6
2020	70,662[a]	+9.9
2030	76,649[a]	+8.5

Note: a - Estimate by the Office of State Budget and Management

Table 7

Stanly County Population By Township

Township	1970	1980	1990	2000
Almond	1,989	1,596	2,454	2,997
Big Lick	3,552	4,361	4,287	4,686
Center	4,702	5,490	5,755	5,954
Endy	1,124	1,280	1,630	1,931
Furr	4,441	5,113	7,064	9,046
Harris	4,260	4,917	5,360	6,330
North Albemarle	12,661	13,039	13,234	13,941
Ridenhour	1,325	2,008	2,223	2,468
South Albemarle	7,540	8,631	7,937	8,358
Tyson	1,651	1,689	1,821	2,389

Note: Estimate by the Office of State Budget and Management

Economy and Employment

Another important factor to be considered in estimating the future traffic growth of an area is its economic base. The number of employers and the average per capita income, or purchasing power, influences how much population can be supported in an area and the number of motor vehicles that will be locally owned and operated. Generally, as family income increases so does the number of vehicles owned, as well as the number of vehicles trips generated per day by each household. An accurate projection of the future economy of an area is essential in estimating future travel demand.

Factors that will influence economic growth and development in Stanly County over the thirty year planning period include the expansion of the urban areas along the Cabarrus and Union County line. Another influence on the future economic growth of Stanly County is potential industrial development along US 52 and NC 24/17. Increased amounts of tourism and development in prime waterfront location may also result in secondary growth for Stanly County.

Land Use

Land use refers to the physical patterns of activities and functions within a municipality or county. Traffic problems in a given area often can be attributed to adjacent land use. For example, a large industrial plant may cause congestion during shift change hours on a road that otherwise has little, if any, congestion. The spatial distribution of different types of land uses is a predominant determinant of when, where, and to what extent traffic congestion occurs. The travel demand between different land uses and the resulting impact on traffic conditions varies depending on the size, type, intensity, and spatial separation of development.

For use in transportation planning, land uses are grouped into the categories defined below.

- **Residential** - land devoted to the housing of people (excludes hotels and motels)
- **Commercial** - land devoted to retail trade, including consumer and business services and offices
- **Industrial** - land devoted to manufacturing, storage, warehousing, and transportation of products
- **Public** - land devoted to social, religious, educational, cultural, and political activities

Figure 7 shows the area's existing land use map, which was provided by Stanly County.

Anticipated future land use is a logical extension of the present spatial distribution. Determination of where and what type of growth is expected to occur within the planning area facilitates developing proposed thoroughfares or the improvement of existing thoroughfares. Areas of anticipated development and growth for Stanly County are listed below.

- Residential - Furr, East Center, and West Center Townships
- Commercial/Retail - North Albemarle Township
- Industrial - Harris Township

- Public - continued preservation of the Morrow Mountain State Park, Lake Tillery and Baden Lake waterfront property, and all historic districts

The largest growth expectations are for western Stanly County. This development is anticipated primarily along NC 24/27, which is scheduled in the TIP for improvements. The slowest growth expectations are for the eastern portions of the county. This slow growth is primarily attributed to the fact that most of the commercial, retail, and industrial development will occur in the western to central portion of the county.

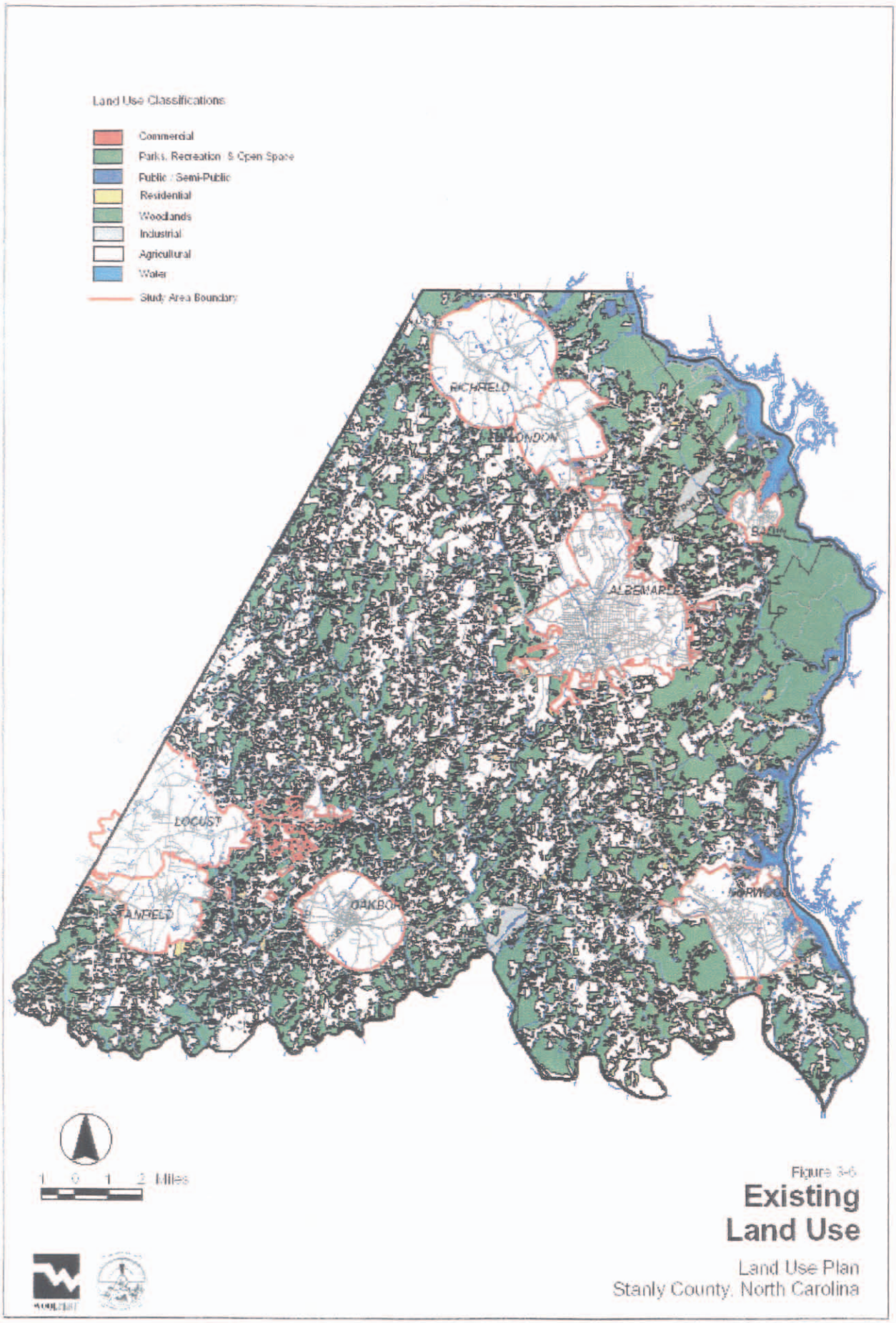


Figure 3-6

Existing Land Use

Land Use Plan
Stanly County, North Carolina

FIGURE 7

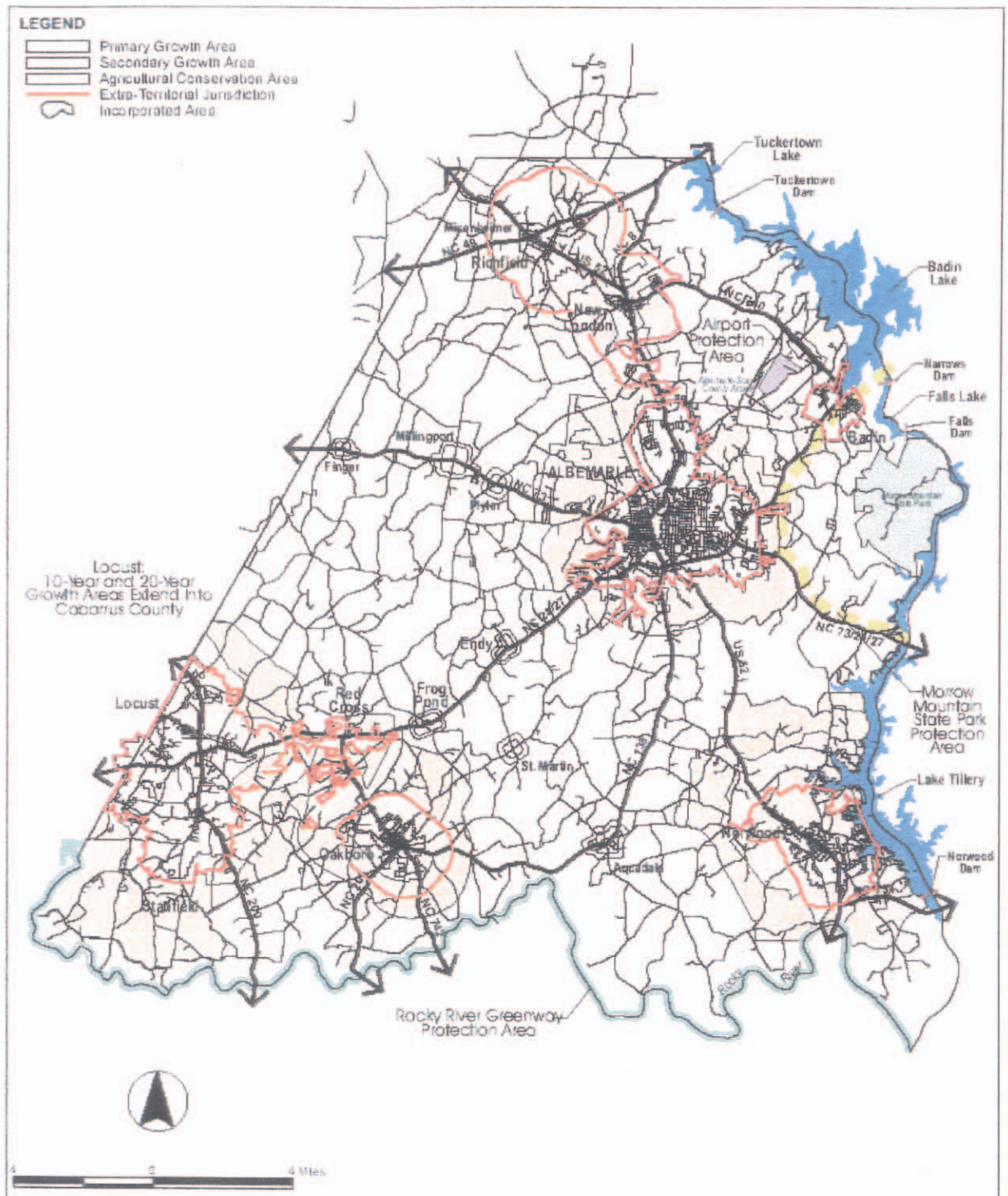


Figure 6-1

Long-Range Plan Recommendations

Land Use Plan
Stanly County, North Carolina

WOOLPERT

FIGURE 8

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 for the past thirty years were used in a linear regression analysis to estimate ADT for the planning year 2030. The projected 2030 ADT for Stanly County's functionally classified roads are shown in Figure 8 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 C, except LOS B for rural roadways functionally classified as arterials. 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 Stanly County listed below are anticipated to be over capacity by the planning year 2030.

- US 52: From Cabarrus County to Albemarle Northern Urban Planning Area Boundary
- US 52: From Albemarle Southern Urban Planning Area Boundary to Anson County.
- NC 8: From US 52 to .8 mile south of SR 1514 (Baldwin Road)
- NC 24/27: From the Albemarle Western Urban Planning Area Boundary to the Locust Urban Planning Area Boundary
- NC 27/27: From the Albemarle Eastern Urban Planning Area Boundary to Montgomery County
- NC 24/27: From the Western Locust Urban Planning Area Boundary to the Cabarrus County Line.
- NC 49: From Cabarrus County to Davidson County.
- NC 73: From the Albemarle Western Urban Planning Area Boundary to Cabarrus County
- NC 138: From the Albemarle Southern Urban Planning Area Boundary to SR 1914 (Cooper Road)
- NC 200: From the Locust Eastern Urban Planning Area Boundary to Cabarrus County

Refer to Figure 9 for depiction of these deficient corridors and 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 Stanly County's functionally classified roads are given in Appendix B, Table B-1.

Roads Approaching Capacity

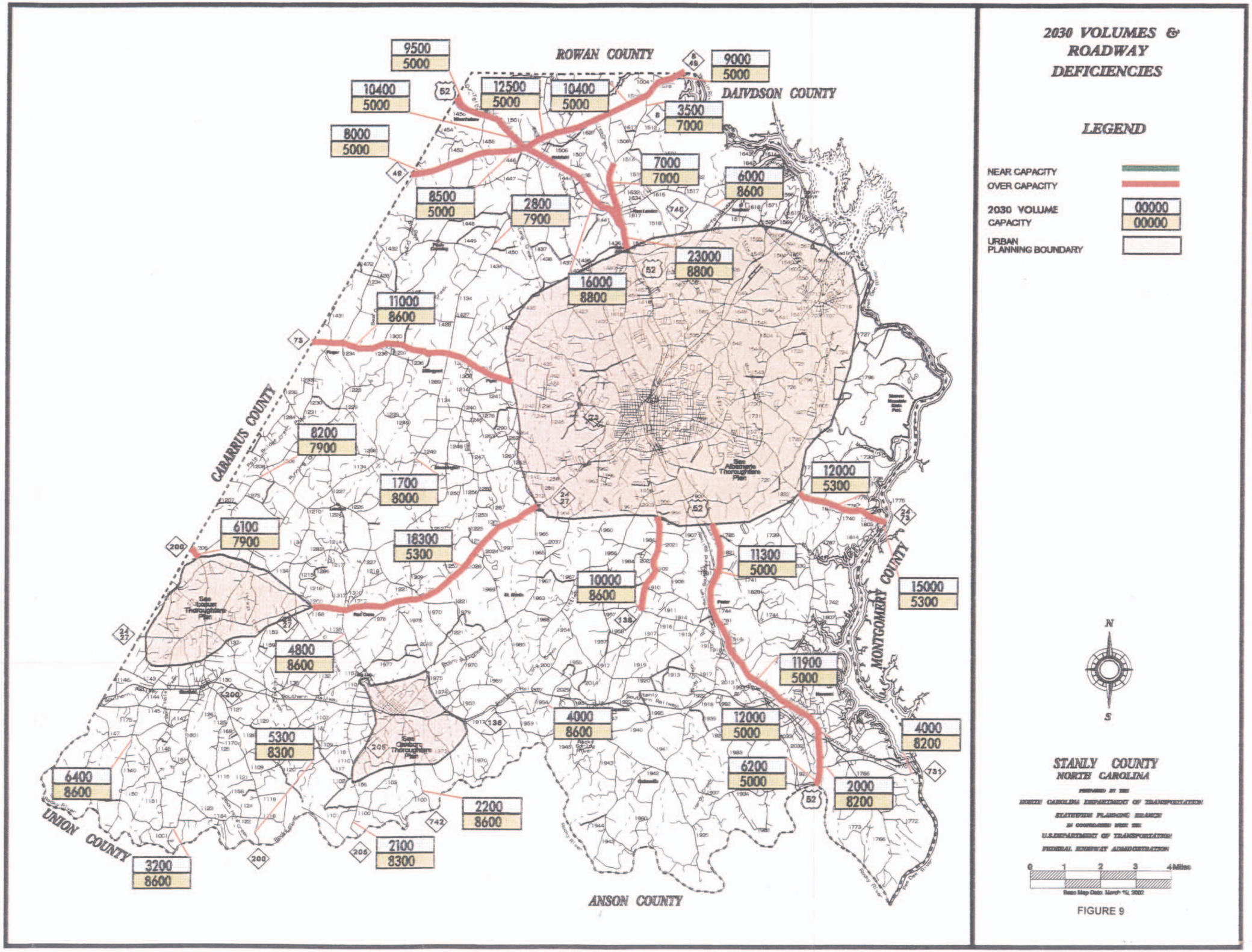
No other roads in the planning area are expected to have congestion problems within the planning period. However, to improve safety and operating conditions, it is recommended that the functionally classified roads in Stanly County with substandard lane widths be upgraded to meet safety and design standards.

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 Stanly County, no system deficiencies were identified that warrant improvements.

Intersection Deficiencies

Ineffective intersection design or control can contribute to poor traffic flow, increased traffic crashes, and driver irritation. Most of the major traffic intersections in Stanly County are located within the municipalities. Analysis of Stanly County's roadway system did not reveal any intersection deficiencies.


2030 VOLUMES & ROADWAY DEFICIENCIES
LEGEND
NEAR CAPACITY
OVER CAPACITY
2030 VOLUME
CAPACITY
00000
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URBAN PLANNING BOUNDARY
ROWAN COUNTY
DAIVDSON COUNTY
CABARRUS COUNTY
MONTGOMERY COUNTY
UNION COUNTY
ANSON COUNTY
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STANLY COUNTY
NORTH CAROLINA
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
0 1 2 3 4 Miles
Base Map Date: March 14, 2002

FIGURE 9

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.

Threatened and Endangered Species

A preliminary review of Federally Listed Threatened and Endangered Species within Stanly 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.

Refer to Figure 10 for the locations of threatened and endangered species throughout Stanly County. These locations are depicted on Figure 10 as national heritage sites. A detailed field investigation is recommended prior to construction of any highway project or roadway improvement.

Historic Sites

The locations of historic sites in Stanly 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 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.

The State Plan for Historic Preservation was used to identify sites within Stanly County. Many of these sites are located in the rural areas of the county. The historic district of Pfeiffer Junior College is listed on the National Register of Historical Properties. The Randle House, located in the Norwood vicinity is also listed on the National Register of Historical Properties. 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. None of the other properties should be affected by the projects proposed on the thoroughfare plan. However, 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.

Archaeology

The only significant archaeological site is Hardaway Site at Hardaway Point. None of the proposed projects should have an impact on this site. However, all efforts will be made to avoid or minimize any impacts to archaeological sites prior to any roadway improvements or construction. Therefore, a more detailed study should be done in regard to local archaeological sites prior to construction of any project.

Legend Abbreviations
Figure 10
Environmental Map

cbpl – county boundaries
dotcitybdry – city boundaries
hsdnrtp – historic national register site
hwfu – Hasardous waste facility
srvpt – marine/estuarine aquatic bed
saesh – significant aquatic endangered species
hyar – hydrography
hqwdot – high quality water zone
nwipl – national wetlands inventory
archnrpl – archaelogical sites
majhyar – major hydrography
mtt – transportation miscellaneous
archnrpt – archaeological sites
troutdwq – trout streams
swf – solid waste facilities
nheo – natural heritage occurence site
amr – artificial marine reefs
swi – surface water intake
afsa – anadromous fish spawning areas
wetlan – wetlands
wsw – water supply watersheds
troutwrc – fishing designated trout waters
hsdnrpl – hazardous substance disposal
majhypl – major hydrography
fna – fisheries nursery areas
dotairport - airport

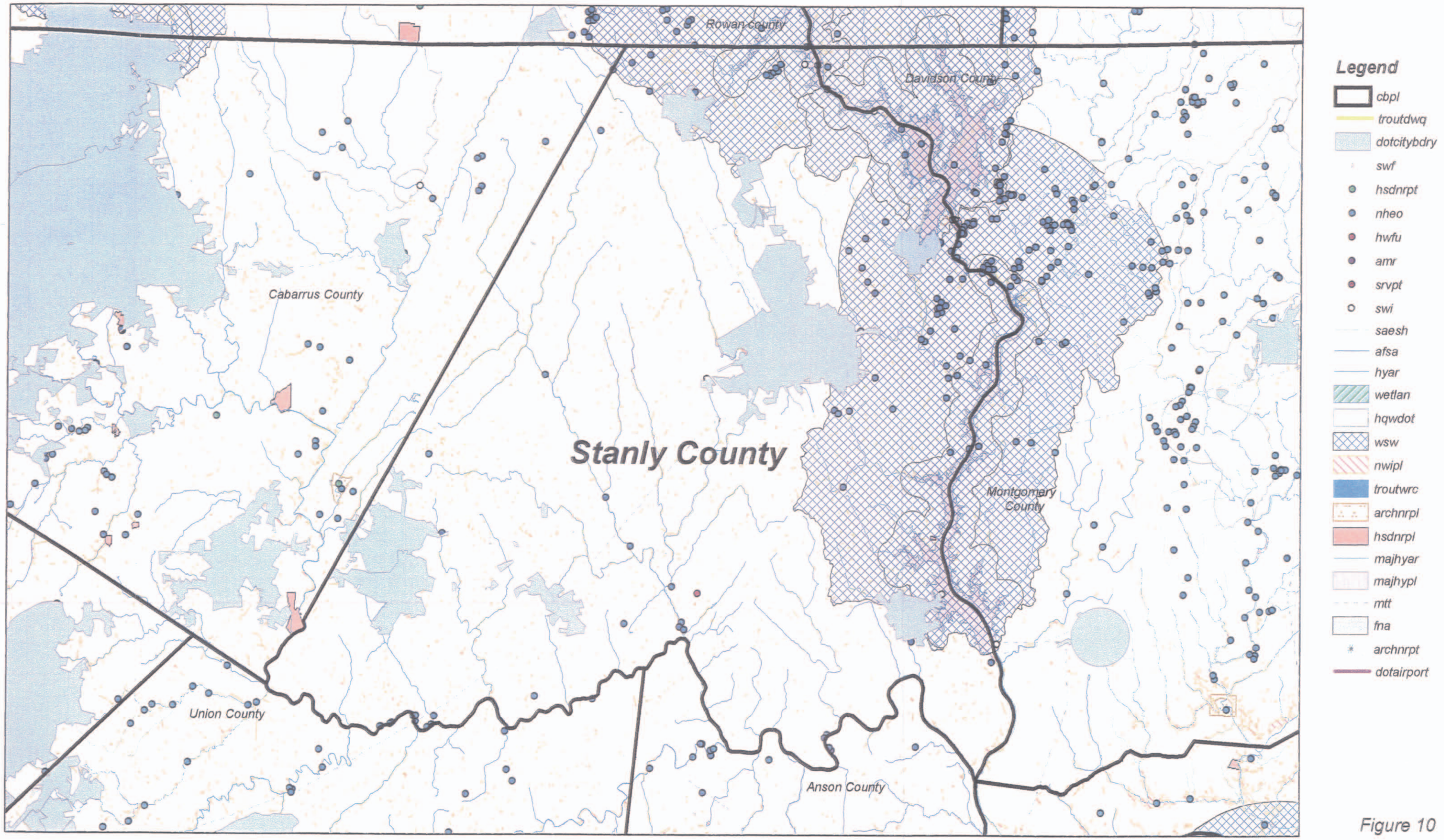

Rowan County
Davidson County
Cabarrus County
Stanly County
Montgomery County
Union County
Anson County
Legend
cbpl
troutdwq
dotcitybdry
swf
hsdnrpt
nheo
hwfu
amr
srvpt
swi
saesh
afsa
hyar
wetlan
hqwdot
wsw
nwipl
troutwrc
archnrpl
hsdnrpl
majhyar
majhypl
mtt
fna
archnrpt
dotairport

Figure 10

APPENDICES

Appendix A
Thoroughfare Planning Principles

There are many advantages to thoroughfare planning, but the primary objective is to assure that the road system will be progressively developed to serve future travel desires. Thus, the main consideration in thoroughfare planning is to make provisions for street and highway improvements so that, when the need arises, feasible opportunities to make improvements exist.

Benefits of Thoroughfare Planning

There are two major benefits derived from thoroughfare planning. First, each road is designed to perform a specific function and provide a specific level of service. This permits savings in right-of-way, construction, and maintenance costs. It also protects residential neighborhoods and encourages stability in travel and land use patterns. Second, thoroughfare planning allows local officials to be informed of future improvements and enables them to incorporate this information into planning and policy decisions. This permits developers to design subdivisions in a non-conflicting manner, enables school and park officials to better locate their facilities, and minimizes the damage to property values and community appearance that could otherwise be associated with roadway improvements.

County Thoroughfare Planning Concepts

The purpose of the thoroughfare planning is to provide a functional roadway system that permits direct, efficient, and safe travel. Different elements in the system are designed to have specific functions and levels of service, thus minimizing the traffic and land service conflict.

In a county thoroughfare plan, elements are either urban or rural. In an urban planning area, the local municipality generally has planning jurisdiction. Outside the urban planning area, the county has planning jurisdiction. In those urban areas where no urban thoroughfare plan exists, elements are rural and are under the planning jurisdiction of the county.

Within both urban and rural systems, transportation elements are classified according to the specific function they are designed to perform. A discussion of the elements and functions of the two systems follows.

Thoroughfare Classification Systems

Roads perform two primary functions, traffic service and land access. These functions can be served effectively when both traffic volumes and demand to access land are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely developed abutting property may lead to intolerable traffic flow friction and congestion.

The underlying concept of a thoroughfare plan is that it provides a functional system of roads that permits travel from origins to destinations with directness, ease, and safety. Different roads in this system are designed to perform specific functions, thus minimizing the conflict between traffic service and land access.

Urban Classification

For urban thoroughfare plans, roadways are classified as major thoroughfares, minor thoroughfares, or local access streets.

Major Thoroughfares
These routes are the primary traffic arteries of the urban area and they accommodate traffic movements within, around, and through the area.

Minor Thoroughfares
Roadways classified as this type collect traffic from the local access streets and carry it to the major thoroughfare system.

Local Access Streets
This classification includes all streets that have a primary purpose of providing access to the abutting property. This category is further classified as either residential, commercial and/or industrial, depending upon the type of land use that is served.

Due to the limited amount of detail that can be shown on a county thoroughfare plan, only urban major thoroughfares are shown.

Rural Classification

A rural classification system is used for county thoroughfare plans, which also show the major thoroughfares within urban thoroughfare planning boundaries. There are four major systems in the rural classification system: principal arterials, minor arterials, major and minor collectors, and local roads.

Rural Principal Arterial System
The principal arterial system is a connected network of continuous routes that serve corridor movements having substantial statewide or interstate travel characteristics. Longer trip lengths and greater travel densities characterize this type of travel. The principal arterial system should serve all urban areas of over 50,000 in population and most of those with a population greater than 5,000. The interstate system constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System
The minor arterial system forms a network that links cities, large towns, and other major traffic generators, such as large resorts. The minor arterial system generally serves intrastate and intercounty travel and travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

Rural Collector Road System

The rural collector routes generally serve intracounty travel. These routes serve travel whose distances are shorter than on the arterial routes. The rural collector road system is subclassified into major and minor collector roads.

Major Collector Roads

These routes provide service to most sizable towns not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, significant mining and agricultural areas, etc. Major collector roads also link these places to routes of higher classification and serve the more important intracounty travel corridors.

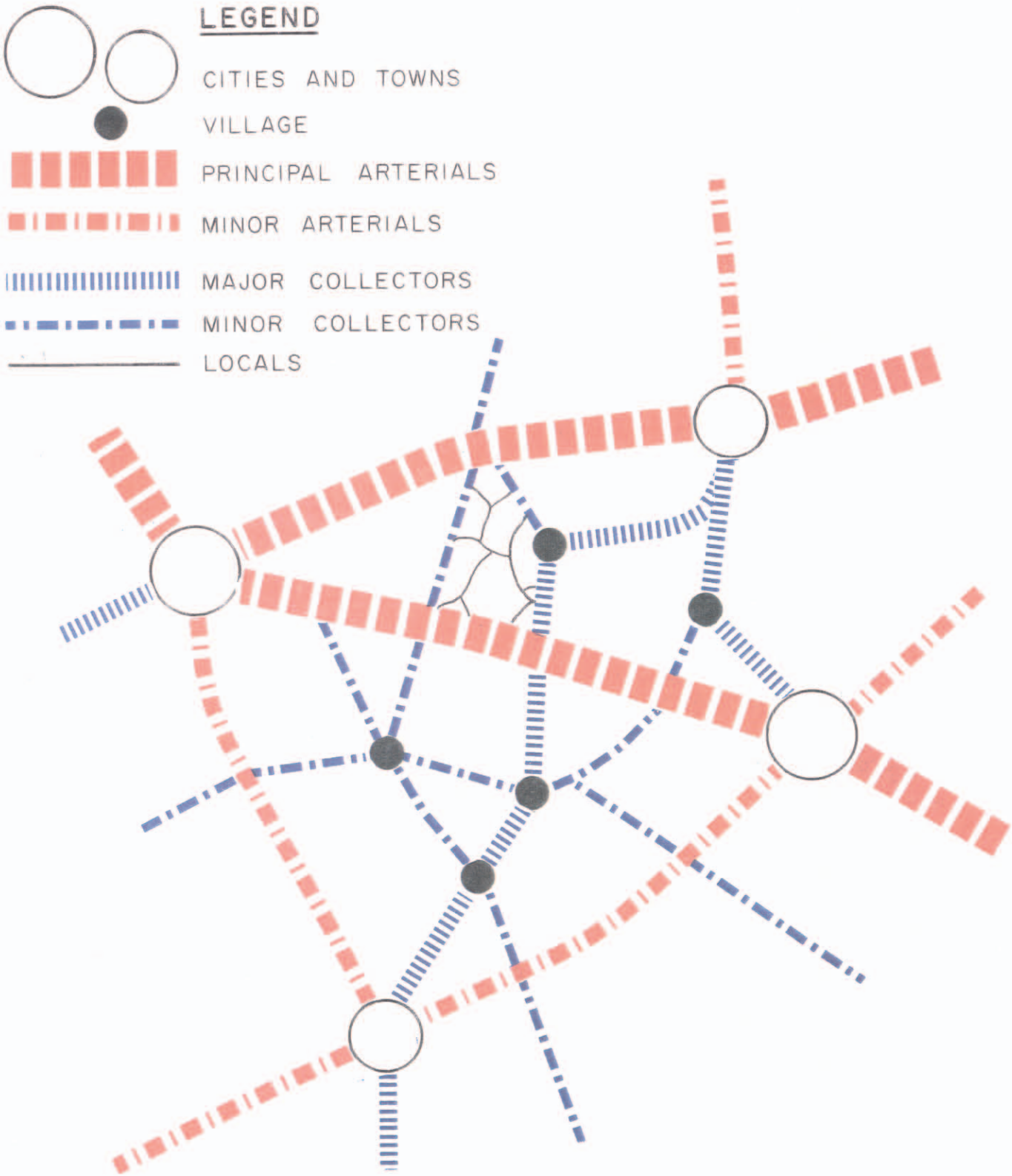
Minor Collector Roads

These roads collect traffic from local roads and provide a link within a reasonable distance to a major collector road. Minor collectors also provide service to the remaining smaller communities and link rural areas to the locally important traffic generators.

Rural Local Road System

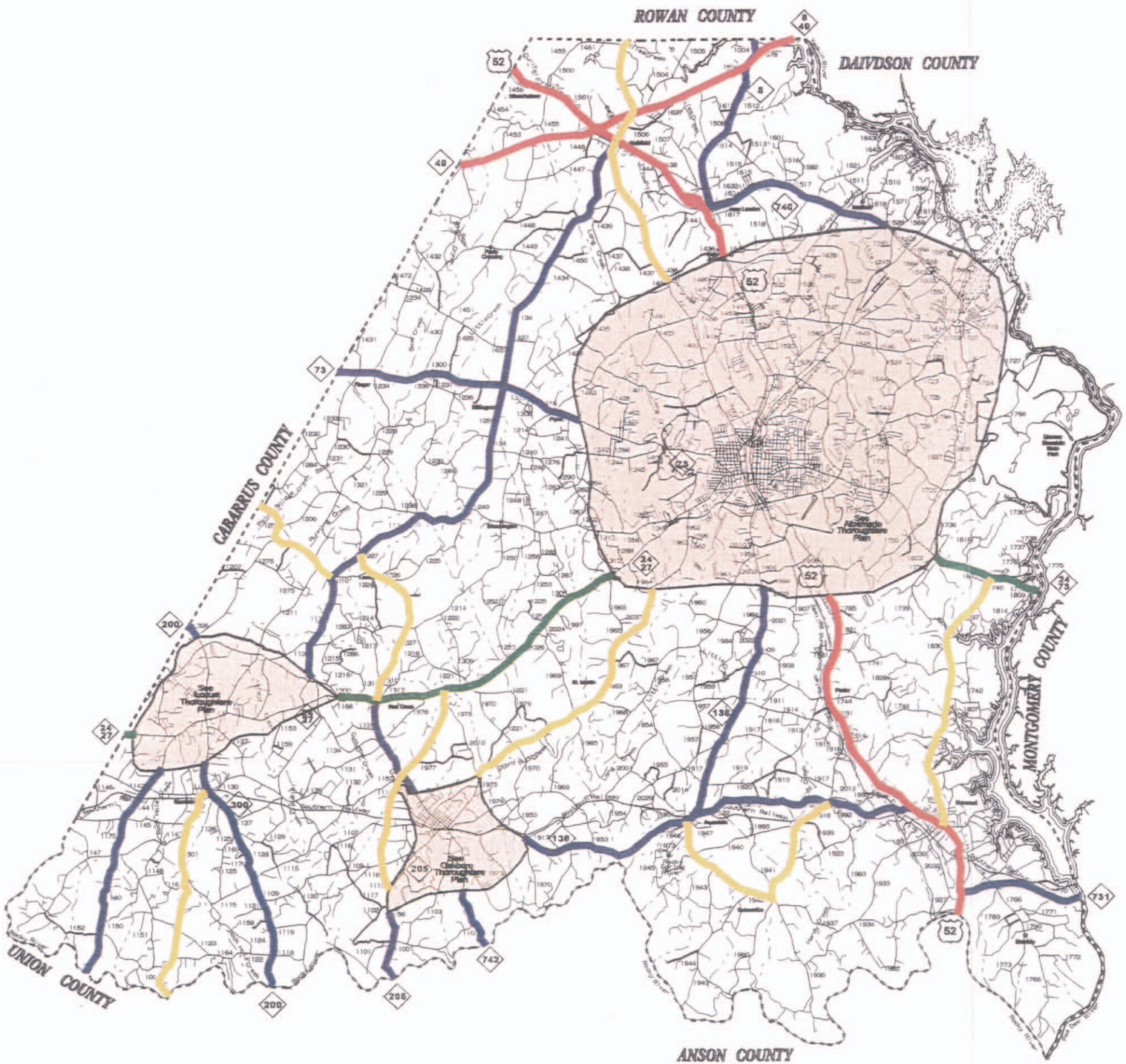
The local road system consists of all facilities not on a higher system. Local residential streets and residential collector streets are elements of this system. Facilities designated as local residential streets are either cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length. These streets do not connect thoroughfares or serve major traffic generators and do not collect traffic from more than one hundred dwelling units. Residential collector streets serve as the connecting street system between local residential streets and the thoroughfare system.

Figure A-1 gives a schematic illustration of the functional classification of a rural highway system. The functional classification for Stanly County is shown in Figure A-2.



SCHEMATIC ILLUSTRATION
OF FUNCTIONALLY CLASSIFIED
RURAL HIGHWAY NETWORK

FIGURE A-1



FUNCTIONAL CLASSIFICATION

LEGEND

- INTERSTATE
- OTHER PRINCIPAL ARTERIAL
- MINOR ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- PLANNING BOUNDARY

N

S

STANLY COUNTY
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4 Miles

Base Map Date: March 18, 2002

FIGURE A2

Objectives of Thoroughfare Planning

Thoroughfare planning is the process public officials use to assure the development of the most appropriate roadway system to meet existing and future travel desires within the urban area or county. The primary aim of a thoroughfare plan is to guide the development of the roadway system in a manner consistent with changing traffic patterns. Thoroughfare planning enables road improvements to be made as traffic demands increase and ensure only needed improvements are implemented, eliminating the expense of unnecessary projects. By developing the roadway system to keep pace with increasing traffic demands, maximum utilization of the system can be attained, requiring a minimum amount of land for transportation purposes. In addition to providing for traffic needs, urban thoroughfare plans should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The present and future population dispersion, as well as commercial and industrial development, affect major street and highway locations. Conversely, the location of major streets and highways within a given area influences the local development pattern.

Objectives of a thoroughfare plan include:

- To provide for the orderly development of an adequate major roadway system as land development occurs;
- To reduce travel and transportation costs;
- To reduce the cost of major roadway improvements to the public through the coordination of the roadway system with private action;
- To enable private interest to plan their actions, improvements, and development with full knowledge of public intent;
- To minimize disruption and displacement of people and businesses through long range advance planning for major roadway improvements;
- To reduce environmental impacts, such as air pollution, resulting from transportation, and
- To increase travel safety.

These objectives are achieved through improving both the operational efficiency of thoroughfares, and improving the system efficiency through system coordination and layout.

Operational Efficiency

The operational efficiency of a road is improved by increasing the capability of the street to carry more vehicular traffic and people. In terms of vehicular traffic, a road's capacity is defined by the maximum number of vehicles that can pass a given point on a road during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, prevailing traffic characteristics, and weather.

Physical ways to improve vehicular capacity include:

- **Roadway widening -** Widening of a road from two to four lanes more than doubles the capacity of the road by providing additional maneuverability for traffic.
- **Intersection improvements -** Increasing the turning radii, adding exclusive turn lanes, and channelizing movements can improve the capacity of an existing intersection.
- **Improving vertical and horizontal alignment -** Alignment improvements reduce congestion caused by slow moving vehicles.
- **Eliminating roadside obstacles -** Improving lateral clearance reduces side friction and improves a driver's field of sight.

Operational ways to improve a road's capacity include:

- **Control of Access -** A roadway with complete access control can often carry three times the traffic handled by a non-controlled access road with identical width and number of lanes.
- **Parking removal -** Capacity is increased by providing additional roadway width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.
- **One-way operation -** The capacity of a street can be increased by 20 -50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.
- **Reversible lanes -** Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.
- **Signal phasing and coordination -** Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced in the following ways:

- **Carpools -** Encouraging the formation of carpools and vanpools for journeys to work and other trip purposes reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.
- **Alternate mode -** Encouragement of transit and bicycle use reduces vehicular congestion.
- **Work hours -** Programs by industries, businesses, and institutions to stagger work hours or establish variable work hours for employees spreads peak travel over a longer time period and thus reduces peak hour demand.
- **Land use -** Planning land use can control development or redevelopment in a more travel efficient manner.

System Efficiency

Another means for altering travel demand on existing facilities is the development of a more efficient system of roads that will better serve travel desires. A more efficient transportation system can reduce travel distances, time, and user costs. Improvements in system efficiency can be achieved through the concept of functional classification of roads and development of a coordinated major street system.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of thoroughfare classification systems, operational efficiency and system efficiency, are conceptual tools available to aid in developing a thoroughfare plan. However, in practice thoroughfare planning is done for established urban areas or counties and is constrained by existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these and the many other factors that affect road locations.

Through the thoroughfare planning process it is necessary, from a practical viewpoint, that certain basic principles be followed as closely as possible. These principles are listed below.

1. The plan should be derived from a thorough knowledge of existing travel - its component parts, and the factors that contribute to it, limit it, and modify it.

2. Traffic demands must be sufficient to warrant the designation and development of each facility. The thoroughfare plan should be designed to accommodate a large portion of major traffic movements on a few roads.

3. The plan should conform to and provide for the land development plan for the area.

4. Certain considerations must be given to development beyond the current planning period. Particularly in outlying or sparsely developed areas that have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights-of-way for future thoroughfare development.

5. While being consistent with the above principles and realistic in terms of travel trends, the thoroughfare plan must be economically feasible.

Appendix B
Thoroughfare Plan Street Tabulation and Recommendations

This appendix includes a detailed tabulation of all roads identified as elements of the Stanly County Thoroughfare Plan. The table includes a description of the roads by sections, as well as the length, cross section, and right-of-way for each section. Also included are the existing and projected average daily traffic volumes, the practical roadway capacity, and the recommended ultimate lane configuration. It should be noted that the practical capacities for rural roadways are based on a level of service of B for roads functionally classified as arterials and level of service C for all other roads. The practical capacity for all roads in urban areas are based on a level of service D. Refer to Chapter 4 for a description and illustration of the levels of service and Figure A-2 for the functional classification of Stanly County roads. Due to space constraints, the recommended cross-sections are given in the following form: number of lanes/ alphabetic code. A detailed description and illustrative figure for each of the alphabetic codes for cross sections can be found in Appendix C.

The following index of terms may be helpful in interpreting the table:

ADQ – Adequate
Co. – County
DIST – Distance
EXIST. – Existing
N/A – Not Available
No. – Number
REC. – Recommended
RDWY – Roadway
ROW – Right-of-Way
UPB –Urban Planning Boundary
NCL – Northern City Limits
SCL - Southern City Limits
ECL – Eastern City Limits
WCL – Western City Limits

Appendix B

Thoroughfare Plan Street Tabulation and Recommendation

FACILITY & SECTION	EXISTING CROSS-SECTION				PRACTICAL CAPACITY		AVERAGE DAILY TRAFFIC		RECOMMENDED CROSS-SECTION		
	DIST MI	RDWY FT	ROW FT	NO. LANES	EXIST.	REC.	2000 (vpd)	2030 (vpd)	NO. LANES	CROSS SECT.*	ROW (FT)
US 52											
Anson Co. Line to NC 731	0.48	24	60	2	5,000	9,000	4,800	6,200	4	F	110
NC 731 to SCL of Norwood	0.57	24	60	2	5,000	9,000	4,800	6,200	4	F	110
Norwood SCL to Oak Street	1.09	24	60	2	5,000	9,000	7,800	7,400	4	F	110
Oak Street to Whitley Street	1.02	22	60	2	5,000	9,000	7,800	7,400	4	F	110
Whitley Street to NCL of Norwood	0.68	26	60	2	5,000	9,000	7,800	7,400	4	F	110
NCL of Norwood to the S UPB of Albemarle	7.7	26	60	2	5,000	9,000	7,800	7,400	4	F	110
N UPB of Albermarle to SCL of New London	0.2	68	100	4	8,800	37,700	13,500	23,000	4	F	110
SCL of New London to NCL of New London	0.78	68	150	4	8,800	37,700	13,500	23,000	4	F	110
NCL of New London to SCL of Richfield	2.12	64	80	4	8,800	37,700	13,500	23,000	4	F	110
SCL of Richfield to NC 49	0.1	64	80	4	8,800	37,700	6,200	10,400	4	F	110
NC 49 to NCL of Richfield	0.22	24	60	2	5,000	37,700	6,200	10,400	4	F	110
NCL of Richfield to Cabarus County Line	2.18	24	60	2	5,000	37,700	6,200	9,500	4	F	110
NC 8											
US 52 to NC 740	0.2	40	60	4	7,000	37,700	5,000	7,000	2	K	110
NC 740 to NCL of New London	0.37	20	60	2	7,000	37,700	5,000	7,000	2	K	110
NCL of New London to NC 49	0.39	20	60	2	7,000	37,700	7,000	9,000	2	K	110
NC 24											
From Cabarus Co Line to WCL of Locust	0.36	48	200	4	5,300	37,700	11,000	17,000	4	F	110
From WCL of Locust to NC 200	2.47	30	60	2	5,300	37,700	11,000	17,000	4	F	110
NC 200 to ECL of Locust	1.36	24	60	2	5,300	37,700	11,000	17,000	4	F	110
ECL of Locust to NC 205	1.75	29	60	2	5,300	37,700	11,000	17,000	4	F	110
NC 205 to Urban Bdry of Albemarle	8.25	29	60	2	5,300	33,700	8,000	17,000	4	F	110
SR 1740 to Montgomery County Line	1.18	24	60	2	5,300	33,700	9,000	12,00	4	F	110
NC 49											
From Davidson county toWCL Richfield	3.12	22	60	2	5,000	9,000	4,000	4,500	4	F	110
WCL of Richfield to RR Xing	3.36	22	60	2	5,000	9,000	4,000	4,500	4	F	110
RR Xing to US 52	0.06	22	60	2	5,000	9,000	4,000	4,500	4	F	110
US 52 to ESC Richfield	0.24	22	60	2	5,000	9,000	7,000	12,500	4	F	110
ESC Richfield to NC 8	3.04	22	60	2	5,000	9,000	7,000	8,500	4	F	110
NC 8 to Rowan County Line	1.06	22	60	2	5,000	9,000	6,500	8,500	4	F	110
NC 73											
From Cabarus County Line to WCL Albemarle	8.18	24	60	2	8,600	37,700	6,400	11,000	3	H	100
NC 138											
0.4 mile north of ECL of Oakboro to width chg	0.47	22	60	2	8,600	9,000	2,100	4,000	2	K	100
Width change to width change	3.11	18	60	2	8,600	9,000	2,100	4,000	2	K	100
Width change to width change	0.81	22	60	2	8,600	9,000	2,100	4,000	2	K	100
Width change to SR 1935	1.54	18	60	2	8,600	9,000	6,500	10,000	3	H	100

Appendix B

Thoroughfare Plan Street Tabulation and Recommendation

FACILITY & SECTION	EXISTING CROSS-SECTION				PRACTICAL CAPACITY		AVERAGE DAILY TRAFFIC		RECOMMENDED CROSS-SECTION		
	DIST MI	RDWY FT	ROW FT	NO. LANES	EXIST.	REC.	2000 (vpd)	2030 (vpd)	NO. LANES	CROSS SECT.*	ROW (FT)
NC 138 continued											
SR 1935 to RR Xing to SCL of Albermarle	7.66	24	60	2	8,600	9,000	6,500	10,000	3	H	100
NC 200											
Union County Line to width change	0.15	24	60	2	7,900	ADQ	1,400	6,100			
Width change to SCL of Stanfield	4.98	22	60	2	7,900	ADQ	1,400	6,100			
SCL of Stanfield to SR 1137	1.82	24	60	2	7,900	ADQ	1,400	6,100			
SR 1137 to NCL of Locust	2.66	24	100	2	7,900	ADQ	1,400	6,100			
NCL of Locust to Cabarus Co. line	0.22	26	100	2	7,900	ADQ	1,400	6,100			
NC 205											
From Union County Line to SCL of Oakboro	1.70	24	60	2	8,300	8,300	1,700	5,300			
.1 mile north of SR 1115 to NC 24/27	2.26	22	60	2	8,300	8,300	1,700	5,300			
NC 731											
Montgomery County Line to US 52	2.96	24	150	2	8,200	14,000	3,000	4,000	3	H	60
NC 740											
From Railroad xing to SR 1511	1.91	24	60	2	8,600	9,000	3,700	6,000	2	K	100
From SR 1511 to ESL New London	4.63	22	60	2	8,600	9,000	3,700	6,000	2	K	100
ESL New London to NC 52	0.58	40	60	2	8,600	ADQ	3,700	2,300			
NC 742											
Union Co Line to NCL of Oakboro	2.39	25	60	2	8,600	ADQ	1,300	2,200			
NCL of Oakboro to Sr 1975	0.35	40	60	2	8,600	ADQ	1,300	2,200			
SR 1975 to NC 205	0.07	48	60	2	8,600	ADQ	1,300	2,200			
SR 1001 (Loves Chapel Rd.)											
NC 200 to the Union County Line	5.3	24	60	2	8,600	ADQ	1,000	3,200			
SR 1005 (High Rock Rd.)											
NC 52 to Rowan County Line	6.3	24	60	2	5,000	ADQ					
SR 1134 (Millingport Rd.)											
US 52 to NC 73	5.87	18		2	7,900	9,000	1,800	2,800	2	K	100
NC 73 to NPB of Locust	9.7	18		2	8,000	9,000	1,100	1,700	2	K	100
SR 1140 (Renee Ford Rd.)											
Locust plan limits to Union C. Line	4.52	24	60	2	8,600	ADQ	3,200	6,400			
SR 1110 (Swift Rd.)											
NC 742 to NC 205	2.4	24	60	2	8,600	ADQ					
SR 1115 (Oak Grove Rd.)											
NC 24 to NC 742	2.46	24	60	2	8,600	ADQ					

Appendix B

Thoroughfare Plan Street Tabulation and Recommendation

FACILITY & SECTION	EXISTING CROSS-SECTION				PRACTICAL CAPACITY		AVERAGE DAILY TRAFFIC		RECOMMENDED CROSS-SECTION		
	DIST MI	RDWY FT	ROW FT	NO. LANES	EXIST.	REC.	2000 (vpd)	2030 (vpd)	NO. LANES	CROSS SECT.*	ROW (FT)
SR 1206 (Five point Rd)											
SR 1208 to SR 1210	0.4	18		2	7,900	9,000			2	K	100
SR 1208 (Barrier Store Rd)											
SR 1206 to Cabarrus County line	1.7	18		2	5,200	9000	4,600	8,200	2	K	100
SR 1210 (Mission Church Rd)											
SR 1206 to SR 1134	1.7	20	60	2	6600	9000			2	K	100
SR 1227 (Ridge Crest Rd)											
NC 24 to SR 1134	5.86	20	60	2	6600	9000			2	K	100
SR 1400 (Old Salisbury Rd)											
N UPB of Albemarle to SR 1134	2.7	20	60	2	6,600	ADQ					
SR 1740 (Indian Mound Rd.)											
NC 24 to NC 52	5.17	20	60	2	6,600	ADQ					
SR 1918 (Cottonville Rd.)											
SR 1922 to SR 1935	2.8	18	60	2	5,200	9,000			2	K	100
SR 1922 (Stanly School Rd.)											
NC 138 to SR 1923	3.82	16		2	5,200	9,000			2	K	100
SR 1923 (Stanly School Rd.)											
SR 1922 to US 52	1.09	18		2	5,200	9,000			2	K	100
SR 1935 (Plank Rd.)											
NC 138 to SR 1941	3.35	22	60	2	7,900	9,000			2	K	100
SR 1963 (Saint Martin Rd.)											
Albemarle SPB to SR 1968	5.2	20	60	2	6,600	9,000			2	K	100
SR 1968 (Saint Martin Rd)											
N UPB of Oakboro to SR 1963	3	24	60	2	8,600	9,000			2	K	100

Appendix C
Typical Thoroughfare Cross Sections

Cross section requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in the design of thoroughfares are not practical. Each roadway section must be individually analyzed and its cross section determined based on the volume and type of projected traffic, existing capacity, desired level of service, and available right-of-way. Based on this criteria, recommended typical cross-sections are given in Appendix B, Table B-1. Typical cross section recommendations are shown in Figure C-1. 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.

On all existing and proposed major thoroughfares delineated on the thoroughfare plan, adequate right-of-way should be protected or acquired for the recommended cross sections. In addition to cross-section and right-of-way recommendations for improvements, Table B-1 may recommend ultimate needed right-of-way for the following situations:

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

Recommended design standards relating to grades, sight distances, degree of curve, super elevation, and other considerations for thoroughfares are given in Appendix D. The typical cross sections are described below.

A - Four Lanes Divided with Median - Freeway

Cross-section "A" is typical for four lane divided highways in rural areas that may have only partial or no control of access. The minimum median width for this cross section is 46 feet, but a wider median is desirable.

B - Seven Lanes - Curb & Gutter

Cross section "B" is typically 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, cross section "C" 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

Cross sections "D" and "E" are typically used on major thoroughfares 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 in danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

F - Four Lanes Divided - Boulevard, Grass Median

Cross-section "F" is typically recommended for urban boulevards or parkways 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

Cross section "G" 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 sections “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

Cross section "K" 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 70 ft will be preserved by use of building setbacks and future street line ordinances.

L - Six Lanes Divided with Grass Median - Freeway

Cross section "L" is typical for controlled access freeways. 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

Also used for controlled access freeways, cross section "M" may be recommended for freeways going through major urban areas or for routes projected to carry very high volumes of traffic.

N - Five Lanes/C&G, Widened Curb Lanes; O - Two Lane/Shoulder Section; P - Four Lanes Divided/Raised Median, C&G, Widened Curb Lanes

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facilities Planning and Design Guidelines should be consulted for design standards for bicycle facilities. Cross sections "N", "O", and "P" are typically used to accommodate bicycle travel.

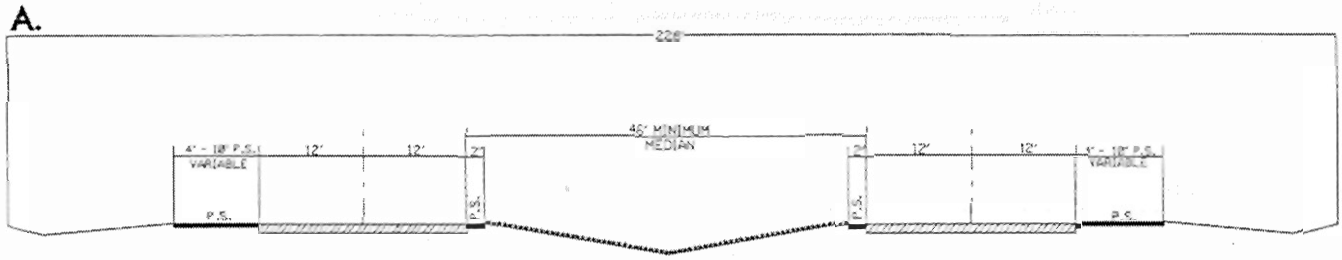
General

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-way shown for each typical cross section is the minimum amount 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.

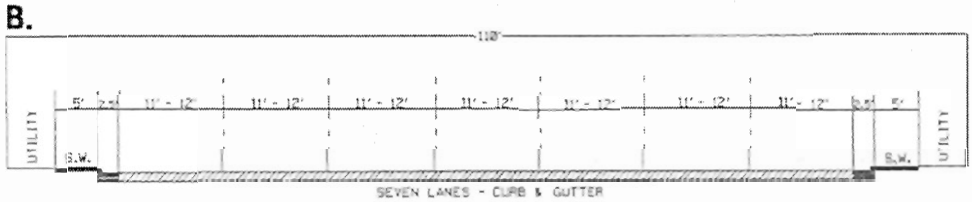
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



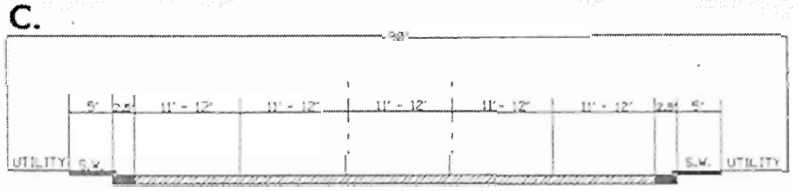
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



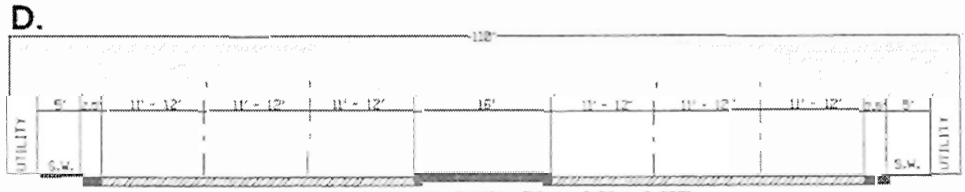
SEVEN LANES - CURB & GUTTER

C.



FIVE LANES - CURB & GUTTER

D.

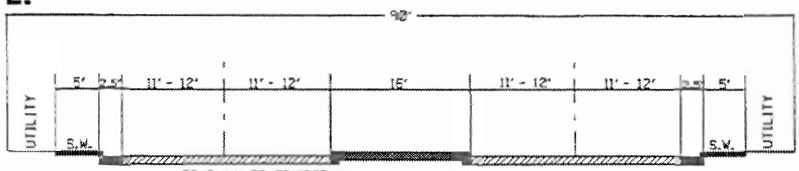


SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

FIGURE: C-1

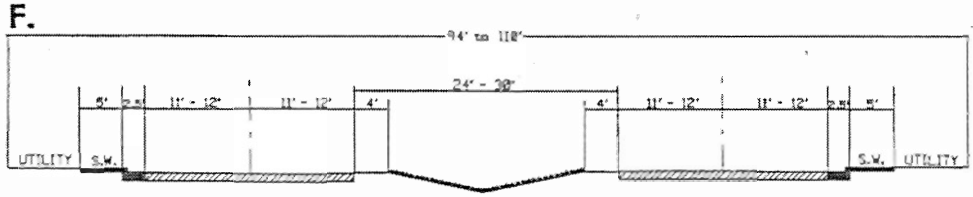
TYPICAL THOROUGHFARE CROSS SECTIONS

E.



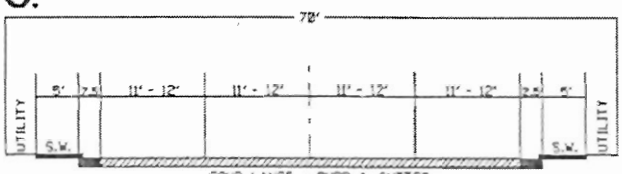
FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

F.



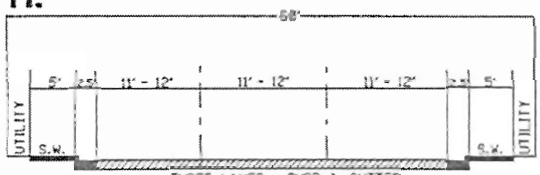
FOUR LANES DIVIDED - BOULEVARD
GRASS MEDIAN

G.



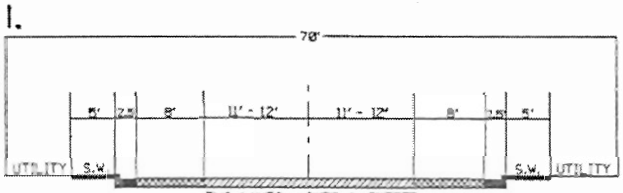
FOUR LANES - CURB & GUTTER

H.



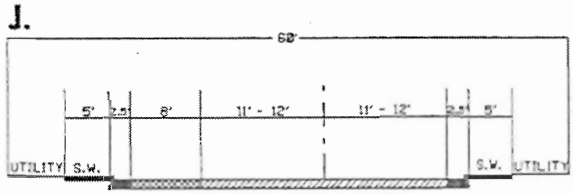
THREE LANES - CURB & GUTTER

I.



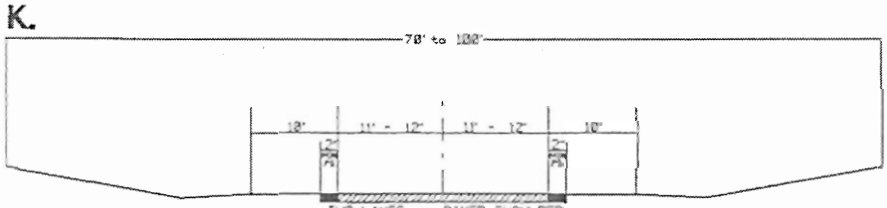
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE

J.



TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE

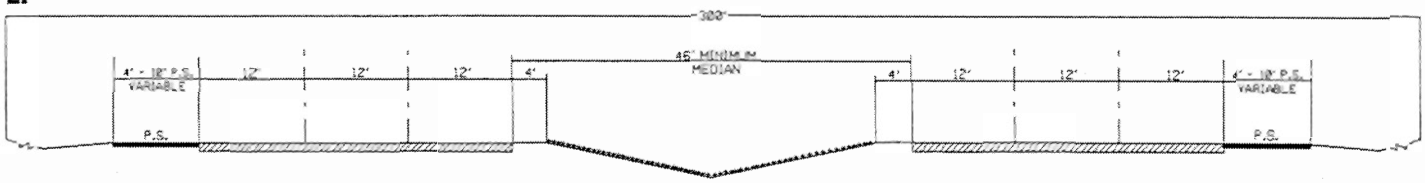
K.



TWO LANES - PAVED SHOULDER

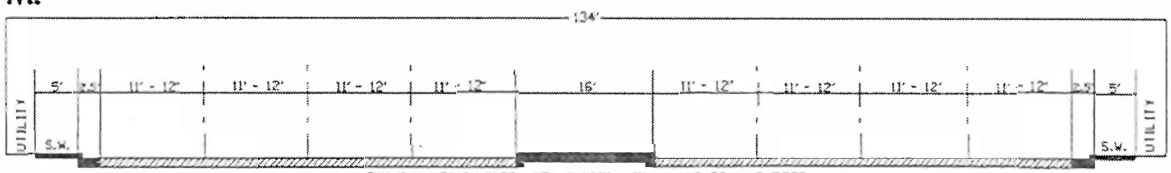
TYPICAL THOROUGHFARE CROSS SECTIONS

L.



SIX LANES DIVIDED WITH GRASS MEDIAN - FREEWAY

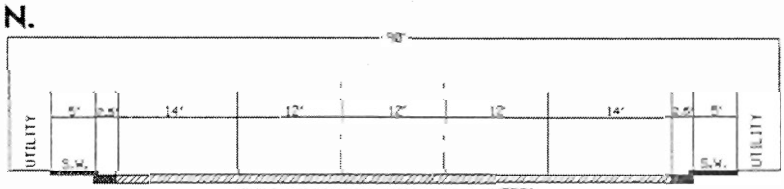
M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

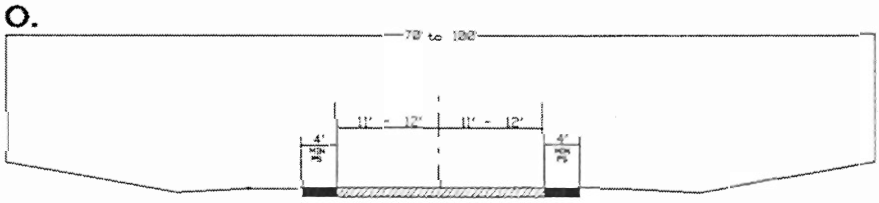
TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



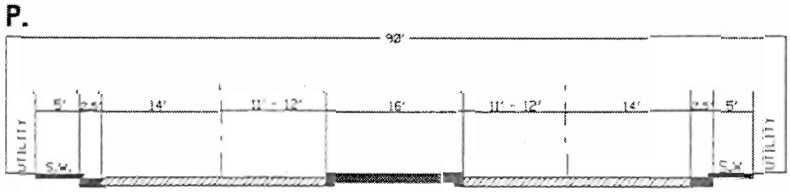
FIVE-LANE ROADWAY WITH CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

O.



TWO LANES - SHOULDER SECTION

P.



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

Appendix D
Recommended Subdivision Ordinances

Definitions

Streets and Roads

Rural Roads

1. *Principal Arterial* - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of interstate routes and other routes designated as principal arterials.

2. *Minor Arterial* - A rural roadway joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement.

3. *Major Collector* - A road which serves major intracounty travel corridors and traffic generators and provides access to the arterial system.

4. *Minor Collector* - A road which provides service to small local communities and traffic generators and provides access to the major collector system.

5. *Local Road* - A road which serves primarily to provide access to adjacent land, over relatively short distances.

Urban Streets

1. *Major Thoroughfares* - Major thoroughfares consist of interstate, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. *Minor Thoroughfares* - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through traffic movements and may also serve abutting property.

3. *Local Street* - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

Specific Type Rural or Urban Streets

1. *Freeway, expressway, or parkway* - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A *freeway* provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of

interchanges. An *expressway* is a facility with full or partial control of access and generally with grade separations at major intersections. A *parkway* is for non-commercial traffic, with full or partial control of access.

2. *Residential Collector Street* - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. *Local Residential Street* - Cul-de-sacs, loop streets less than 2500 feet in length, or streets less than 1.0 miles in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. *Cul-de-sac* - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.

5. *Frontage Road* - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.

6. *Alley* - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

Property

1. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

2. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

3. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

Subdivision

- Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

- Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets.

  The following shall not be included within this definition nor subject to these regulations:

  * the combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein,
  * the division of land into parcels greater then 10 acres where no street right-of-way dedication is involved,
  * the public acquisition, by purchase, of strips of land for the widening or the opening of streets, and

* the division of a tract in single ownership whose entire area is no greater than 2 acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

- Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.

- Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

Roadway Design Standards

The design of all roads within a planning area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway & Transportation Officials' (AASHTO) manuals.

The provision of right-of-way for roads shall conform and meet the recommendations of the thoroughfare plan, as adopted by the municipality or county. The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally, the proposed streets should be the extension of existing streets if possible.

Right-of-Way Widths

Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the thoroughfare plan.

The subdivider will only be required to dedicate a maximum of 100 feet of ROW. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. In all cases in which ROW is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width ROW, not less then 60 feet, may be dedicated when adjoining undeveloped property is owned or controlled by the subdivider. This is provided that the width of a partial dedication is such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is sub-divided, the remainder of the full required right-of-way shall be dedicated.

Table D-1

Minimum Right-of-way Requirements

Area Classification	Functional Classification	Minimum ROW
RURAL	Principle Arterial	Freeways- 350 ft Other- 200 ft
	Minor Arterial	100 ft
	Major Collector	100 ft
	Minor Collector	80 ft
	Local Road	60 ft[1]
URBAN	Major Thoroughfare	90 ft
	Minor Thoroughfare	70 ft
	Local Street	60 ft[1]
	Cul-de-sac	variable[2]

[1] The desirable minimum ROW is 60 ft. If curb and gutter is provided, 50 ft of ROW is adequate on local residential streets.

[2] The ROW dimension will depend on radius used for vehicular turn around. Distance from edge of pavement of turn around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn around.

Street Widths

Widths for street and road classifications other than local shall be as recommended by the thoroughfare plan. Width of local roads and streets shall be as follows:

- ***Local Residential***
  - * Curb and Gutter section: 26 feet, face to face of curb
  - * Shoulder section: 20 feet to edge of pavement, 4 feet for shoulders

- ***Residential Collector***
  - * Curb and Gutter section: 34 feet, face to face of curb
  - * Shoulder section: 20 feet to edge of pavement, 6 feet for shoulders

Geometric Characteristics

The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under the 'Right-of-Way Widths' section shall apply.

1. *Design Speed* - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets are shown in Table D-2.

2. *Minimum Sight Distance* - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the parameters set forth in Table D-3.

3. *Superelevation* - Table D-4 shows the minimum radius and the related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

4. *Maximum and Minimum Grades* - The maximum grades in percent are shown in Table D-5. Minimum grade should not be less then 0.5%. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

Table D-2

Design Speeds

Facility Type	Design Speed (mph) Desirable	Minimum Level	Minimum Rolling
RURAL			
Minor Collector Roads (ADT Over 2000)	60	50	40
Local Roads[1] (ADT Over 400)	50	*50	*40
URBAN			
Major Thoroughfares[2]	60	50	40
Minor Thoroughfares	40	30	30
Local Streets	30	**30	**20

Note: *Based on ADT of 400-750. Where roads serve a limited area and small number of units, can reduce minimum design speed. **Based on projected ADT of 50-250. (Reference NCDOT Roadway Design Manual page 1-1B)

[1] Local Roads including Residential Collectors and Local Residential.

[2] Major Thoroughfares other than Freeways or Expressways.

Table D-3

Sight Distance

Design Speed (mph)	Stopping Sight Distance (feet)		Minimum K[1] Values (feet)		Passing Sight Distance (feet)
	Desirable	Minimum	Crest Curve	Sag Curve	For 2-lanes
30	200	200	30	40	1100
40	325	275	60	60	1500
50	475	400	110	90	1800
60	650	525	190	120	2100

Note: General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case. (Reference NCDOT Roadway Design Manual page 1-12 T-1)

[1]K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length of the vertical curve, which will provide the desired sight distance. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990"

Table D-4

Superelevation

Design Speed (mph)	Minimum Radius of Maximum e[1]			Maximum Degree of Curve		
	e=0.04	e=0.06	e=0.08	e=0.04	e=0.06	e=0.08
30	302	273	260	19 00'	21 00'	22 45'
60	573	521	477	10 00'	11 15'	12 15'
80	955	955	819	6 00'	6 45'	7 30'
100	1,637	1,432	1,146	3 45'	4 15'	4 45'

[1] e = rate of roadway superelevation, foot per foot

Note: (Reference NCDOT Roadway Design Manual page 1-12 T-6 thru T-8)

Table D-5

Maximum Vertical Grade

Facility Type and Design Speed (mph)		Minimum Grade in Percent		
		Flat	Rolling	Mountainous
RURAL				
Minor Collector Roads*				
	20	7	10	12
	30	7	9	10
	40	7	8	10
	50	6	7	9
	60	5	6	8
	70	4	5	6
Local Roads*[1]				
	20	-	11	16
	30	7	10	14
	40	7	9	12
	50	6	8	10
	60	5	6	-
URBAN				
Major Thoroughfares[2]				
	30	8	9	11
	40	7	8	10
	50	6	7	9
	60	5	6	8
Minor Thoroughfares*				
	20	9	12	14
	30	9	11	12
	40	9	10	12
	50	7	8	10
	60	6	7	9
	70	5	6	7
Local Streets*				
	20	-	11	16
	30	7	10	14
	40	7	9	12
	50	6	8	10
	60	5	6	-

Note: *For streets and roads with projected annual average daily traffic less than 250 or short grades less than 500 ft long, grades may be 2% steeper than the values in the above table. (Reference NCDOT Roadway Metric Design Manual page 1-12 T-3)

[1] Local Roads including Residential Collectors and Local Residential.

[2] Major Thoroughfares other than Freeways or Expressways.

Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Offset intersections are to be avoided. Intersections that cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

Cul-de-sacs

Cul-de-sacs shall not be more than 500 feet in length. The distance from the edge of pavement on the vehicular turn around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provisions are mode for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least 20 feet.

3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn around as may be required by the planning board.

Permits for Connection to State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet form the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the

physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Horizontal Width on Bridge Deck

The clear roadway widths for new and reconstructed bridges serving two-lane, two-way traffic should be as follows:

- shoulder section approach:
  - * under 800 ADT design year - minimum 28 feet width face to face of parapets, rails, or pavement width plus 10 feet, whichever is greater,
  - * 800 - 2000 ADT design year - minimum 34 feet width face to face of parapets, rails, or pavement width plus 12 feet, whichever is greater,
  - * over 2000 ADT design year - minimum width of 40 feet, desirable width of 44 feet width face to face of parapets or rails;
- curb and gutter approach:
  - * under 800 ADT design year - minimum 24 feet face to face of curbs,
  - * over 800 ADT design year - width of approach pavement measured face to face of curbs,
  - * where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face curbs, and in crown drop; the distance from face of curb to face of parapet or rail shall be a minimum of 1.5 feet, or greater if sidewalks are required.

The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

- shoulder section approach - width of approach pavement plus width of usable shoulders on the approach left and right. (shoulder width 8 feet minimum, 10 feet desirable)
- curb and gutter approach - width of approach pavement measured face to face of curbs.

Appendix E
Index for Secondary Road Numbers

- SR 1001 – Loves Chapel Road
- SR 1004 – Pineview Road
- SR 1005 – High Rock Road
- SR 1110 – Swift Road
- SR 1115 – Liberty Hill Church Road
- SR 1134 – Running Creek Church Rd
- SR 1134 – Millingport Road
- SR 1140 – Renee Ford Road
- SR 1206 – Five Point Road
- SR 1208 – Mission Church Road
- SR 1210 – Mission Church Road
- SR 1227 – Ridgecrest Road
- SR 1740 – Indian Mound Road
- SR 1766 – Fork Road
- SR 1918 – Cottonville Road
- SR 1922 – Stanly School Road
- SR 1923 – Stanly School Road
- SR 1400 – Old Salisbury Road
- SR 1918 – Cottonville Road
- SR 1935 – Plank Road
- SR 1963 – Saint Martin Road
- SR 1968 – Saint Martin Road

Appendix F
Transportation Improvement Program
Project Request Process

The process for requesting projects to be included in the Transportation Improvement Program (TIP) is described briefly in this appendix.

The local representatives should first decide which projects from the thoroughfare plan they would like funded in the TIP. A TIP request for a few carefully selected projects is likely to be more effective than requesting all the projects proposed in the thoroughfare plan. These projects should be prioritized by the local representatives and summarized briefly, as shown on Appendix Page F-3.

After determining which projects are the highest priority for the area, a TIP project request should be sent to the Board of Transportation Member from the municipality's or county's respective district. The TIP project request should include a letter with a prioritized summary of requested projects, as well as a TIP candidate project request form and a project location map for each project. An example of each of these items is included in this appendix.

Example

* *Note: This is not an official request submitted to the Board of Transportation. This is intended to be an example of a Transportation Improvement Program (TIP) Request.*

Month ##, Year

North Carolina Board Member
N. C. Board of Transportation
N. C. Department of Transportation
P. O. Box 25201
Raleigh, NC 27611-5201

Dear Board Member:

SUBJECT: 2000-2006 TIP Project Requests for *Generic* County

Enclosed find the projects requested by *Generic* County for consideration in the next TIP update. The list is presented by priority, as approved by the *Generic* County Commissioners at their *Month* meeting.

Generic County also endorsed the existing schedule of projects contained in the current TIP for the county, with one request. The county requests that TIP Project R-*XXXX* remain as a high priority and kept on the existing schedule.

We thank you for the opportunity to participate in development of the State TIP. Please contact us immediately if additional information is needed concerning any of the enclosed project requests.

Sincerely,

John Q. Public

cc: Division Engineer
Enclosure

Generic County
County Commissioners
2000 Proposed Highway Projects (Final)

1) **SR 1111 (Town Street) & SR 1112 (Industry Drive) TIP Project R-XXXX**
   - From SR 1113 (Country Road) to NC 11
   - Widen roadway to a multilane facility, with some new location

2) **US 11**
   - From SR 1112 (Industry Drive) to SR 1113 (Country Road)
   - Widen roadway to a multilane facility

3) **NC 11**
   - From SR 1114 (Any Road) to the existing four lane section just south of I-85
   - Widen roadway to a multilane facility

4) **US 11 Business (Business Road)**
   - From SR 1115 (Some Road) to NC 12
   - Widen facility to a five lane cross section

5) **New Connector**
   - From US 11 to US 112 Business (City Street)
   - New Facility

Highway Program
TIP Candidate Project Request

(Please Provide Information if Available)

Date ##/##/## Priority No. #

County *Generic* City/Town

Requesting Agency *County Commissioners* NCTIP No. *R-####* (if available)

Route (US, NC, SR/Local Name) *SR 1111(Town Street) and SR 1112(Industry Drive)*

Project Location (From/To/Length) *From SR 1113 (Country Road) to NC 11, #.# miles*

Type of Project (Widening, New Facility, Bridge Replacement, Signing, Safety, Rail Crossing, Bicycle, Enhancement, etc.)
Widen roadway to a multi-lane facility, with some new location.

Existing Cross Section *24* Feet, Type

Existing Row *60 to 80* Feet Existing ADT *8,000 (1996)*

Estimated Cost, ROW $ *900,000* Construction $ *4,000,000*

Brief Justification for Project *As a major thoroughfare, this facility carries increasing traffic volumes between the industial sites along this route to NC 11 and the I-85 corridor. In the adopted thoroughfare plan for Generic County, it is recommended that this facility should be widen to a multi-lane cross section due to the increasing volume and the potential for more development in this area. The county requests that this project continue to be funded.*

Project Supported By (Agency/Group)

Other Information/ Justification

- ☒ Part of Thoroughfare Plan
- ☐ Part of Comprehensive Plan
- ☐ Serves School
- ☐ Serves Hospital
- ☐ Obsolete Facility
- ☐ Serves Park
- ☐ High Accident (#_____)
- ☐ _____

(Please Attach Map Showing Project Location)