Comprehensive Transportation Plan

Town of Marshville

July 2010

Comprehensive Transportation Plan

Town of Marshville

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N.C. Department of Transportation

In Cooperation with: Town of Marshville
Rocky River Rural Planning Organization

July 2010

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Executive Summary

In February of 2005, the Transportation Planning Branch of the North Carolina Department of Transportation (NCDOT) and the Town of Marshville initiated a study to cooperatively develop the Marshville Comprehensive Transportation Plan (CTP). This is a long range multi-modal transportation plan that covers transportation needs through the year 2030. Modes of transportation evaluated as part of this plan include: highway, public transportation and rail, bicycle, and pedestrian. This plan does not cover standard bridge replacements, routine maintenance, or minor operations issues. Refer to Appendix A for contact information for these types of issues.

Findings of this CTP study were based on an analysis of the transportation system, environmental screening, and public input. Refer to Figure 1 for the CTP maps, which were mutually endorsed/adopted in 2008/2009. Implementation of the plan is the responsibility of the Town of Marshville and NCDOT. Refer to Chapter 1 for information on the implementation process.

This report documents the recommendations for improvements that are included in the Town of Marshville CTP. The major recommendation for improvements is listed below. More detailed information about this and other recommendations can be found in Chapter 1.

- **UNIO0001-H, US 74:** Implementation of a new location bypass around Marshville from Salem Creek to one mile east of Stegall Rd. (SR 1734). Upgrade to a four-lane freeway with a grass median from one mile east of Stegall Rd. to the Union/Anson County line.

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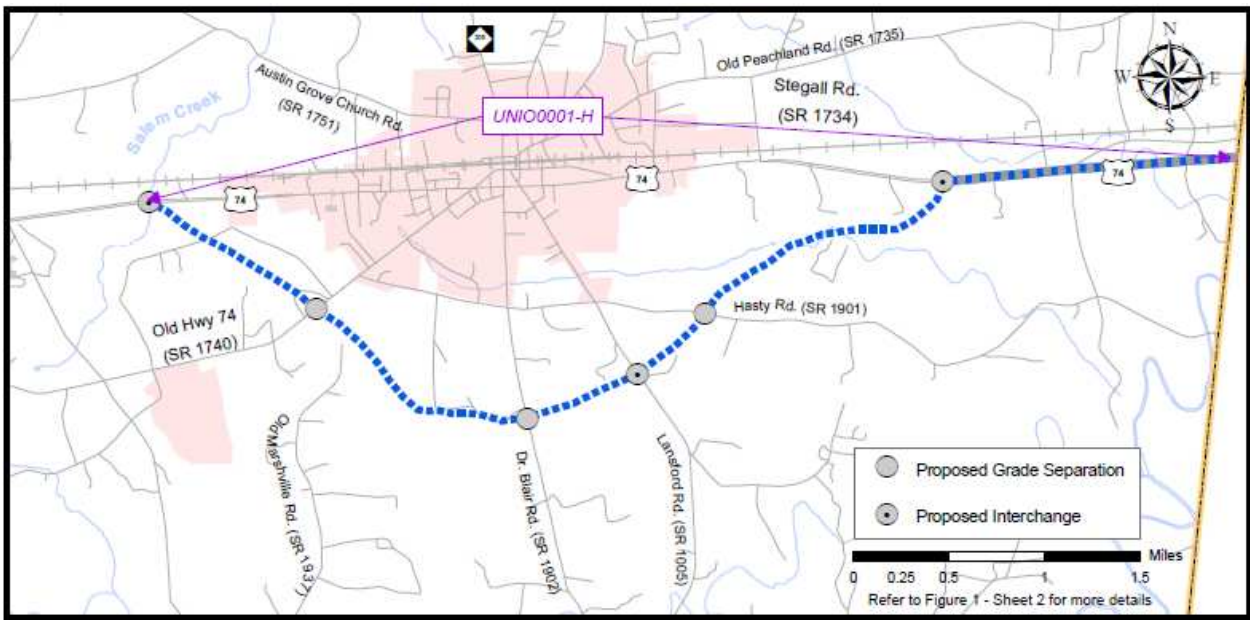
I. Recommendations

A Comprehensive Transportation Plan (CTP) is developed to ensure that the progressively developed transportation system will meet the needs of the region for the planning period. The CTP serves as an official guide to providing a well-coordinated, efficient, and economical transportation system for the future of the region. This document should be utilized by the local officials to ensure that planned transportation facilities reflect the needs of the public, while minimizing the disruption to local residents, businesses and the environment.

This report documents the development of the 2009 Town of Marshville CTP as shown in Figure 1. This chapter presents recommendations for each mode of transportation.

Following are problem statements or project descriptions for each recommendation organized by the CTP modal element.

US 74 Proposed Improvements from
Salem Creek to the Union/Anson County line **ID No.: UNIO0001-H**



Problem Statement

The existing US 74 is projected to be over capacity by 2030 from Salem Creek to one mile east of Stegall Rd. (SR 1734). The primary purpose of improving US 74 is to relieve congestion on the existing facility such that a minimum level of service (LOS) D can be achieved.

Justification of Need

US 74 is a major east-west corridor in Union County, connecting Marshville with other municipal areas, such as Wingate. The facility is a vital artery moving people and goods through North Carolina, connecting two major urban areas, Charlotte and Monroe.

US 74 is currently a boulevard (5-lane cross section) from Salem Creek to one mile east of Stegall Rd. (SR 1734). It is a Strategic Highway Corridor (SHC) that needs improvement from one mile east of Stegall Rd. to the Union/Anson County line.

By 2030 US 74 is projected to be over capacity throughout the Marshville area based on the capacity at LOS D. East of Marshville, traffic is projected to increase from 13,600 vehicles per day (vpd) in 2004 to 31,700 vpd in 2035, compared to a capacity of 29,100 vpd. West of Marshville, traffic is projected to increase from 17,000 vpd to 32,200 vpd, compared to a capacity of 42,100 vpd. Within Marshville, traffic is projected to increase from 18,000 vpd in 2004 to 39,800 vpd in 2035, compared to a capacity of 29,100 vpd.

Community Vision and Problem History

Due to its close proximity to Monroe and Charlotte, Marshville is anticipated to experience a small amount of growth in population over the study period. The land use pattern from the 1992 Marshville Thoroughfare Plan is generally the same as the 2004 future land use plan. The existing facility carries a considerable amount of through traffic, in which trucks make up about 13%.

There is also a need to improve safety along this section of US 74. Accidents at the intersection of US 74 and White St. were also identified in the Marshville Thoroughfare Plan. There were 22 crashes on the section of US 74 within the Marshville planning area boundary during the 2002-2004 period. There were six crashes at the US 74 and Elm St. intersection, seven crashes at the US 74 and White St. intersection and nine crashes at the US 74 and Main St. intersection. Refer to Appendix F for more detailed information.

CTP Project Proposal

Project Description and Overview

The proposed project will provide a 4-lane, freeway facility on new location south of Marshville, connecting US 74 from one mile east of Stegall Rd. (SR 1734) to the Monroe Bypass (TIP Project No. R-2559) that is managed by the North Carolina Turnpike Authority (NCTA). Interchanges are proposed at US 74 (east and west of Marshville) and at Lansford Rd. (SR 1005). Grade separations are proposed at Hasty Rd. (SR 1901), Dr. Blair Rd. (SR 1902) and Old Highway 74 (SR 1740). The proposed project will also provide an upgraded four-lane freeway with a grass median from one mile east of Stegall Rd. (SR 1734) to the Union/Anson County line.

The improvement would relieve future traffic congestion through the Town of Marshville and allow through traffic to channel from US 74. It would provide for a LOS D or better along existing US 74 through Marshville and a LOS C or better on the new location for US 74.

The improvement would allow through traffic to move around the Town of Marshville without the use of traffic signals and also would provide better access to TIP Project No. R-2559. The goal of this recommendation is to allow through trips to move around the area, but at the same time provide a more efficient and direct connection for Marshville residents and visitors.

Linkages to Other Plans and Proposed Project History

The new location proposal for US 74 would connect to TIP Project No. R-2559. US 74 are part of the SHC plan and a statewide tier facility on the North Carolina Multi-Modal Investment Network (NCMIN).

Land Use Patterns
Based on 2000 US Census data, Marshville had a population of 2,360. By the year 2030 Marshville is expected to have a population of 3,221. Marshville is a small community that is notable for turkey and agricultural farming, the lumber industry and poultry processing. There is no substantial future economic growth expected along US 74 Business corridor according to the Marshville Town Administrator.

Natural & Human Environment Context
There were no other alternatives considered for the US 74 new location proposal. Efforts were made to avoid or minimize all known environmental impacts, avoid historic properties and reduce or minimize impacts to residences and businesses while at the same time maximizing the use of the existing US 74.

Multi-modal Considerations
A CATS commuter bus (known as CATS Route 74X) provides two daily round trips to Charlotte, NC.

Public / Stakeholder Involvement
While no significant issues associated with this project were identified during the public/stakeholder involvement process, some residents questioned if a northern alternative had been considered. The northern alternative was not considered due to major river crossings and environmental concerns, along with the need to tie into the Monroe Bypass.

Other Recommendations

UNIO0002-H, NC 205: This two-lane 22-foot wide road serves as a north-south route. Currently there are approximately 3,000 vehicles per day. This is expected to increase to approximately 4,500 vpd by the year 2030. It is recommended that this substandard road be widened to 24 feet from US 74 to the Marshville Planning Area Boundary to improve safety and capacity.

UNIO0003-H, Austin Grove Church Road (SR 1751): This two-lane 18-foot wide road serves as an east-west route to NC 205 and Marshville. It is recommended that this substandard road be widened to 24 feet from NC 205 to Salem Creek/Marshville Planning Area Boundary to improve safety and capacity.

UNIO0004-H, East & West Main Street (SR 1740): This two-lane 20-foot wide road serves as an east-west radial route for US 74. It recommended that this substandard road be widened to 24 feet from US 74 to US 74 to improve safety and capacity.

UNIO0005-H, Olive Branch Road (SR 1719): This two-lane 20-foot wide road serves as a north-south route between Ansonville Rd. (SR 1002) and Old Peachland Rd. (SR 1735). It is recommended that this substandard road be widened to 24 feet from Old Peachland Rd. to the Marshville Planning Area Boundary.

UNIO0006-H, Hasty Road (SR 1901): This two-lane 20-foot wide road serves as an east-west route between Old Highway 74 (SR 1740) and the Marshville Planning Area Boundary. It is recommended that this substandard road be widened to 22 feet from Old Highway 74 to the Marshville Planning Area Boundary to improve safety and capacity.

UNIO0007-H, Lansford Road (SR 1005): This two-lane 22-foot wide road serves as a north-south route between US 74 and the Marshville Planning Area Boundary. It is recommended that this substandard road be widened to 24 feet from Main St. (SR 1740) to the Marshville Planning Area Boundary to improve safety and capacity.

Old Marshville Road (SR 1937): This two-lane 18-foot wide road serves as a north-south route between Gilboa Rd. (SR 1903) and Old Highway 74 (SR 1740). It is recommended that this road be realigned to connect just before the proposed grade separation on Old Highway 74.

Implementation

The CTP is based on the projected growth for the planning area shown in Figure 2. It is possible that actual growth patterns will differ from those logically anticipated. As a result, it may be necessary to accelerate or delay the implementation of some recommendations found within this plan. Some portions of the plan may require revisions in order to accommodate unexpected changes in development. Therefore, any changes made to one element of the CTP should be consistent with the other elements.

Initiative for implementing the CTP rests predominately with the policy boards and citizens in the Town of Marshville. As transportation needs throughout the State exceed available funding, it is imperative that the local planning area aggressively pursue funding for priority projects. Projects should be prioritized locally and submitted to the Rocky River RPO for regional prioritization and submittal to NCDOT. Refer to Appendix A for contact information on funding. Local governments may use the CTP to guide development and protect corridors for the recommended projects. It is critical that NCDOT and local government coordinate on relevant land development reviews and all transportation projects to ensure proper implementation of the CTP. Local governments and NCDOT share the responsibility for access management and the planning, design and construction of the recommended projects.

Adopted by:

Town of Marshville
Date: December 8, 2008

NCDOT
Date: June 4, 2009

Endorsed by:

Rocky River RPO
Date: January 15, 2009

Recommended by:

Transportation Planning Branch
Date: April 24, 2009

NOTES: Sheet 4: There are no existing or recommended bicyle facilities included in this plan.

Sheet 5: There are no existing or recommended pedestrian facilities included in this plan.

Town of Marshville

Union County
North Carolina

Comprehensive Transportation Plan

Plan date: August 28, 2008

Sheet 1 **Adoption Sheet**

Sheet 2 **Highway Map**

Sheet 3 **Public Transportation and Rail Map**

Sheet 4 **Bicycle Map**

Sheet 5 **Pedestrian Map**

Legend

Schools

Planning Boundary

Roads

Railroads

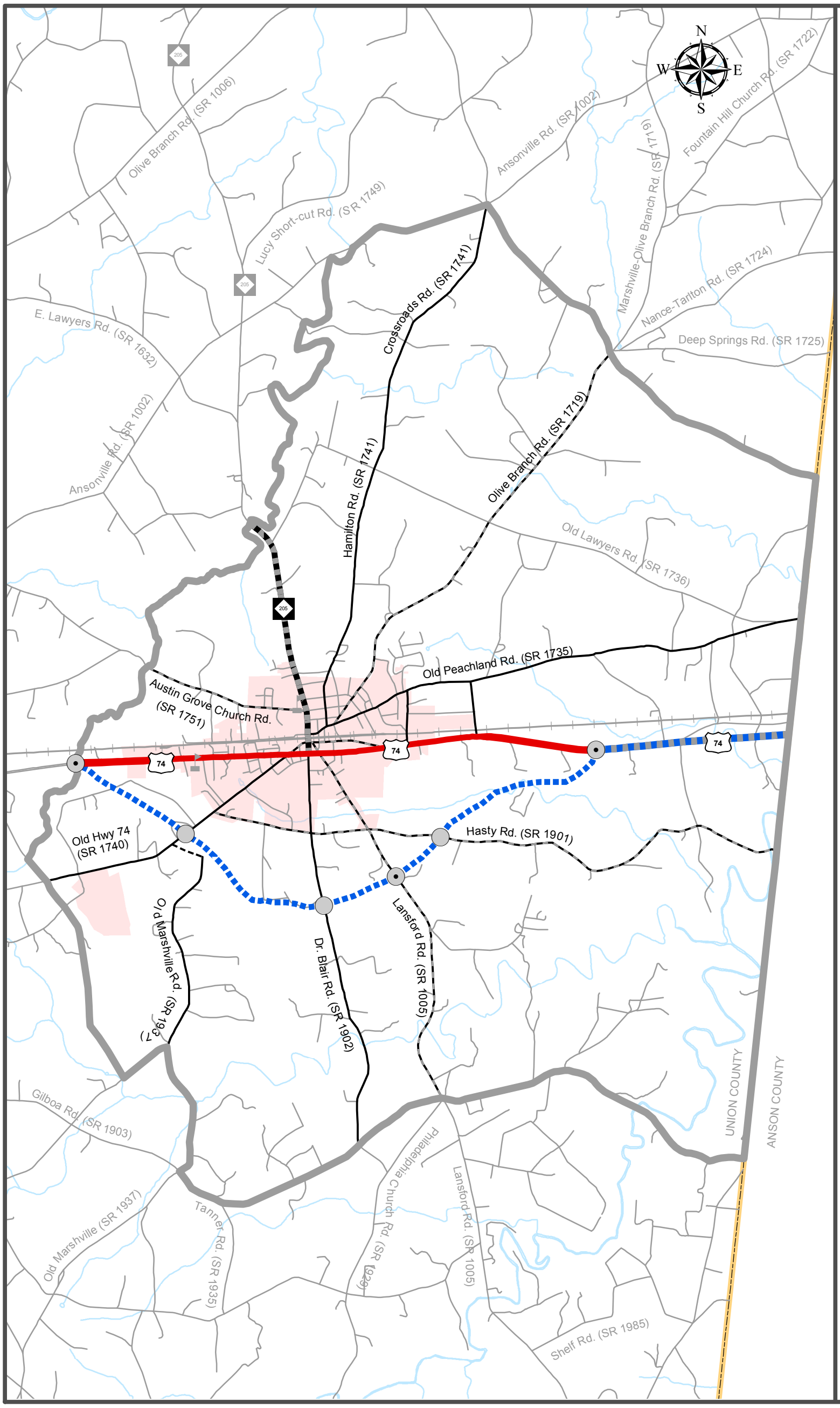
Rivers and Streams

Miles
0 0.25 0.5 1 1.5

Sheet 1 of 5

Base map date: April, 2005

Refer to CTP document for more details



Highway Map

Town of Marshville

Comprehensive Transportation Plan

Plan date: August 28, 2008

Freeways
- Existing
- Needs Improvement
- Recommended

Expressways
- Existing
- Needs Improvement
- Recommended

Boulevards
- Existing
- Needs Improvement
- Recommended

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended

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

Miles
0 0.25 0.5 1 1.5

Sheet 2 of 5

Base map date: April, 2005

Refer to CTP document for more details

Figure 1 - Sheet 2

Public Transportation and Rail Map

Town of Marshville

Comprehensive Transportation Plan

Plan date: August 28, 2008

Bus Routes
- Existing
- Needs Improvement
- Recommended

Fixed Guideway
- Existing
- Needs Improvement
- Recommended

Operational Strategies
- Existing
- Needs Improvement
- Recommended

Rail Corridor
- Active
- Inactive
- Recommended

High Speed Rail Corridor
- Existing
- Recommended

Rail Stops
- Existing
- Recommended

Intermodal Connector
- Existing
- Recommended

Park and Ride Lot
- Existing
- Recommended

Miles
0 0.25 0.5 1 1.5

Sheet 3 of 5

Base map date: April, 2005

Refer to CTP document for more details

Figure 1 - Sheet 3

II. Analysis of the Existing and Future Transportation System

In order to develop a Comprehensive Transportation Plan (CTP), the following are considered:

- Analysis of the transportation system, including any local and statewide initiatives;
- Impacts to the natural and human environment, including natural resources, historic resources, homes, and businesses;
- Public input; including community vision, goals and objectives.

Analysis Methodology and Data Requirements

Reliable forecasts of future travel patterns must be estimated in order to analyze the ability of the transportation system to meet future travel demand. These forecasts depend on careful analysis of the character and intensity of existing and future land use and travel patterns.

An analysis of the transportation system looks at both current and future travel patterns and identifies existing and anticipated deficiencies. This is usually accomplished through a capacity deficiency analysis, a traffic crash analysis, and a system deficiency analysis. This information, along with population growth, economic development potential, and land use trends, is used to determine the potential impacts on the future transportation system.

Roadway System Analysis

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

In the development of this plan, travel demand was projected from 2004 to 2030 using a travel demand model. Travel demand models are developed to replicate travel patterns on the existing transportation system as well as to estimate travel patterns for 2030. In addition, local land use plans and growth expectations were used to develop future growth rates and patterns.

Existing and future travel demand is compared to existing roadway capacities. Capacity deficiencies occur when the traffic volume of a roadway exceeds the roadway's capacity. Roadways are considered near capacity when the traffic volume is at least eighty percent of the capacity. Refer to Figures 2 and 3 for existing and future capacity deficiencies.

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. Many factors contribute to the capacity of a roadway including the following:

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

The relationship of travel demand compared to the roadway capacity determines the level of service (LOS) of a roadway. Six levels of service identify the range of possible conditions. Designations range from LOS A, which represents the best operating conditions, to LOS F, which represents the worst operating conditions.

LOS D indicates "practical capacity" of a roadway, or the capacity at which the public begins to express dissatisfaction. The practical capacity for each roadway was developed based on the 2000 Highway Capacity Manual using the NC Level of Service Program. Recommended improvements and overall design of the transportation plan were based upon achieving a minimum LOS D on existing facilities. Refer to Appendix E for detailed information on LOS.

Traffic Crash Analysis

Traffic crashes are often used as an indicator for locating congestion and roadway problems. Crash patterns obtained from an analysis of crash data can lead to the identification of improvements that will reduce the number of crashes. A crash analysis was performed for the Marshville CTP for crashes occurring in the planning area between January 1, 2002 and December 31, 2004. During this period, a total of three intersections were identified as high crash locations as illustrated in Figure 4. Refer to Appendix F for a detailed crash analysis.

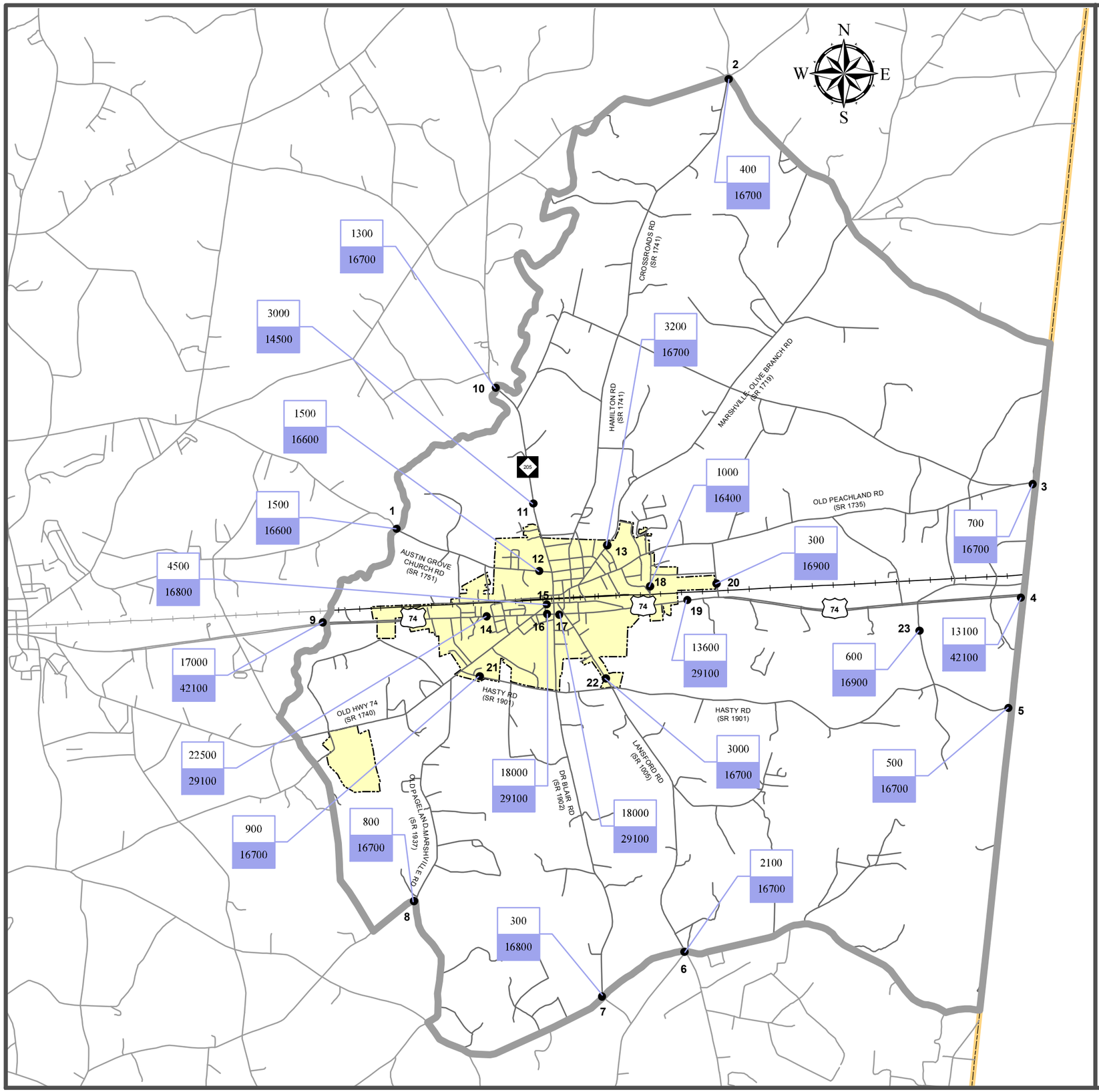


Figure 2

2004 Volumes and Capacity

Legend

- AADT Volume Locations
- Roads
- Railroad
- Planning Boundary
- Town Boundary
- County Boundary
- #### 2004 Volume
- #### 2004 Capacity

Town of

Marshville

UNION COUNTY
North Carolina

PREPARED BY THE
NORTH CAROLINA DEPARMENT OF TRANSPORATION
TRANSPORTATION PLANNING BRANCH

0 0.25 0.5 1 1.5 Miles

Base map date: April, 2005

Refer to CTP document for more details

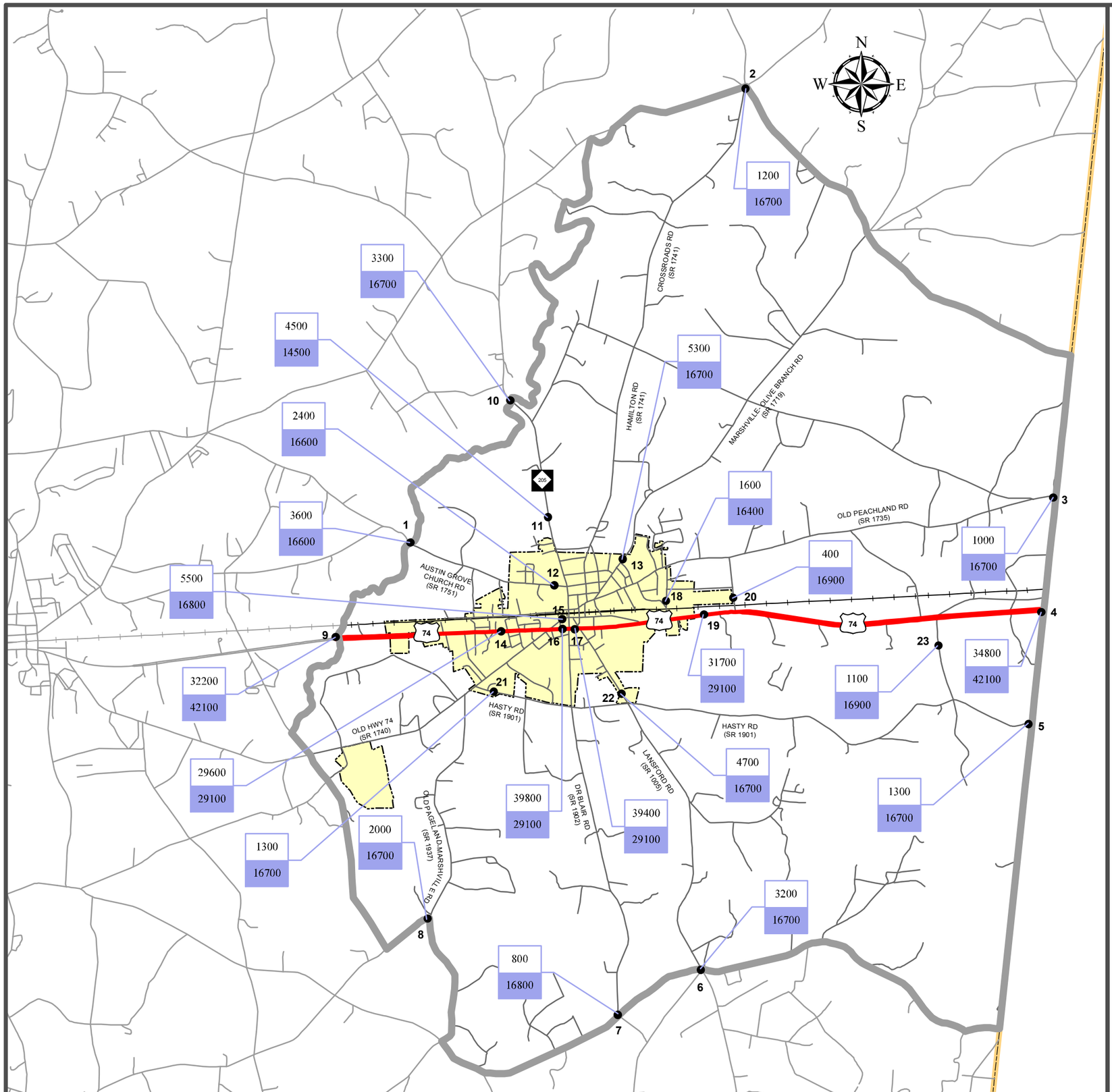


Figure 3

2030 Volumes and Capacity Deficiencies

Legend

- AADT Volume Locations
- Roads
- Railroad
- Road Over Capacity
- Planning Boundary
- Town Boundary
- County Boundary
- #### 2030 Volume
- #### 2004 Capacity

Town of

Marshville

UNION COUNTY
North Carolina

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0 0.25 0.5 1 1.5 Miles

Base map date: April, 2005

Refer to CTP document for more details

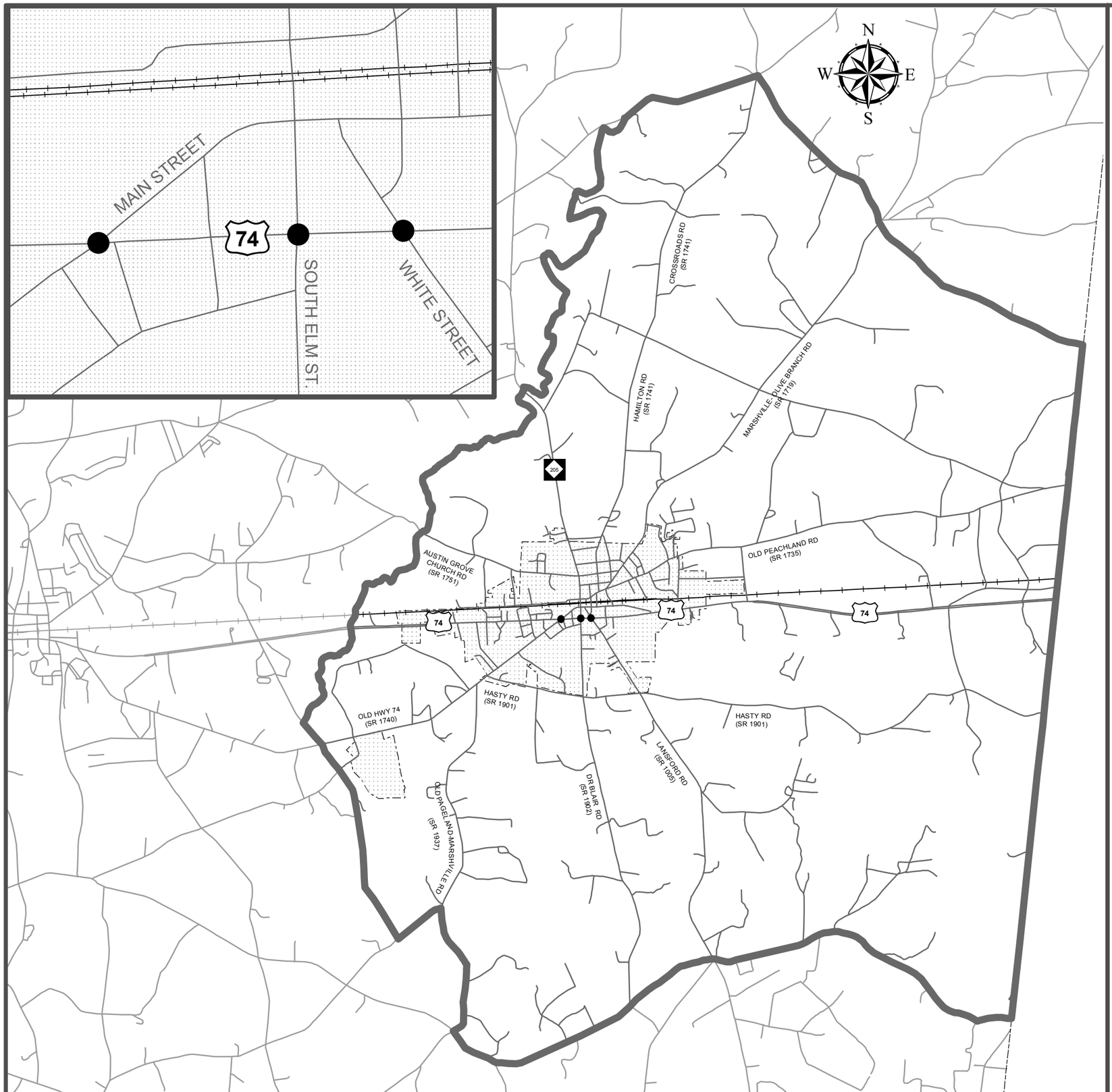

Figure 4

Crash Locations

January 1, 2002 to December 31, 2004

Legend

- Crash Locations
- Roads
- Railroad
- Planning Boundary
- Town Boundary
- County Boundary

Town of

Marshville

UNION COUNTY
North Carolina

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TRANSPORTATION PLANNING BRANCH

0 0.25 0.5 1 1.5 Miles

Base map date: April, 2005

Refer to CTP document for more details

Bridge Assessment

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.

The NCDOT Bridge Maintenance Unit inspects all bridges in North Carolina at least once every two years. Bridges having the highest priority are replaced as Federal and State funds become available. Three deficient bridges were identified within the planning area and are illustrated in Figure 5. Refer to Appendix G for more detailed information.

Public Transportation and Rail

Public transportation and rail are vital modes of transportation that give alternative options for transporting people and goods from one place to another.

Public Transportation

North Carolina's public transportation systems serve more than 50 million passengers each year. Five categories define North Carolina's public transportation: community, regional community, urban, regional urban and intercity.

- Community Transportation - Local transportation efforts formerly centered on assisting clients of human service agencies. Today, the vast majority of rural systems serve the general public as well as those clients.

- Regional Community Transportation - Regional community transportation systems are composed of two or more contiguous counties providing coordinated / consolidated service. Although such systems are not new, the NCDOT Board of Transportation is encouraging single-county systems to consider mergers to form more regional systems.

- Urban Transportation – There are currently nineteen urban transit systems operating in North Carolina, from locations such as Asheville and Hendersonville in the west to Jacksonville and Wilmington in the east. In addition, small urban systems are at work in three areas of the state. Consolidated urban-community transportation exists in five areas of the state. In those systems, one transportation system provides both urban and rural transportation within the county.

- Regional Urban Transportation - Regional urban transit systems currently operate in three areas of the state. These systems connect multiple municipalities and counties.

- Intercity Transportation - Intercity bus service is one of a few remaining examples of privately owned and operated public transportation in North Carolina. Intercity buses serve many cities and towns throughout the state and provide connections to locations in neighboring states and throughout the United States and Canada. Greyhound/Carolina Trailways operates in North Carolina. However, community, urban and regional transportation systems are providing increasing intercity service in North Carolina.

An inventory of existing and planned fixed public transportation routes for the planning area is presented on Sheet 3 of Figure 1. Charlotte Area Transit System (CATS) currently provides Regional Urban Transportation service to Marshville via the 74X Union County Express. This weekday bus route provides transportation between downtown Charlotte and the Marshville park and ride lot. Refer to Appendix A for contact information.

Rail

Today North Carolina has 3,684 miles of railroad tracks throughout the state. There are two types of trains that operate in the state, passenger trains and freight trains.

NCDOT sponsors two passenger trains, the Carolinian and Piedmont. The Carolinian runs between Charlotte and New York City, while the Piedmont train carries passengers from Raleigh to Charlotte and back everyday. Combined, the Carolinian and Piedmont carry more than 200,000 passengers each year.

There are two major freight railroad companies that operate in North Carolina, CSX Transportation and Norfolk Southern Corporation. Also, there are more than 20 smaller freight railroads, known as shortlines.

An inventory of existing and planned rail facilities for the planning area is presented on Sheet 3 of Figure 1. CSX Transportation operates a freight rail line that runs through the Town of Marshville. Refer to Appendix A for contact information.

Bicycles & Pedestrians

Bicyclists and pedestrians are a growing part of the transportation equation in North Carolina. Many communities are working to improve mobility for both cyclists and pedestrians.

NCDOT's Bicycle Policy, updated in 1991, clarifies responsibilities regarding the provision of bicycle facilities upon and along the 77,000-mile state-maintained highway system. The policy details guidelines for planning, design, construction, maintenance, and operations pertaining to bicycle facilities and accommodations. All bicycle improvements undertaken by the NCDOT are based upon this policy.

The 2000 NCDOT Pedestrian Policy Guidelines specifies that NCDOT will participate with localities in the construction of sidewalks as incidental features of highway

improvement projects. At the request of a locality, state funds for a sidewalk are made available if matched by the requesting locality, using a sliding scale based on population.

NCDOT's administrative guidelines, adopted in 1994, ensure that greenways and greenway crossings are considered during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction.

There are no bicycle and pedestrian elements included in this plan. Refer to Appendix A for contact information.

Land Use

G.S. §136-66.2 requires that local areas have a current (less than five years old) land development plan prior to adoption of the CTP. For this CTP, the 2005 Town of Marshville Existing Zoning and 2004 Future Land Use Development Maps were used to meet this requirement and are illustrated in Figures 6 and 7, respectively.

Land use refers to the physical patterns of activities and functions within an area. Traffic demand in a given area is, in part, attributed to adjacent land use. For example, a large shopping center typically generates higher traffic volumes than a residential area. 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. Additionally, traffic volumes have different peaks based on the time of day and the day of the week. For transportation planning purposes, land use is divided into the following categories:

- Residential: Land devoted to the housing of people, with the exception of hotels and motels which are considered commercial.
- Commercial: Land devoted to retail trade including consumer and business services and their offices; this may be further stratified into retail and special retail classifications. Special retail would include high-traffic establishments, such as fast food restaurants and service stations; all other commercial establishments would be considered retail.
- Industrial: Land devoted to the manufacturing, storage, warehousing, and transportation of products.
- Public: Land devoted to social, religious, educational, cultural, and political activities; this would include the office and service employment establishments.
- Agricultural: Land devoted to the use of buildings or structures for the raising of non-domestic animals and/or growing of plants for food and other production.

- Mixed Use: Land devoted to a combination of any of the categories above.

Anticipated future land development is, in general, a logical extension of the present spatial land use distribution. Locations and types of expected growth within the planning area help to determine the location and type of proposed transportation improvements.

The future land use plan for Marshville is primarily residential on the north and south side of town. Industrial, office, central and general business land uses are mainly located along the US 74 corridor.

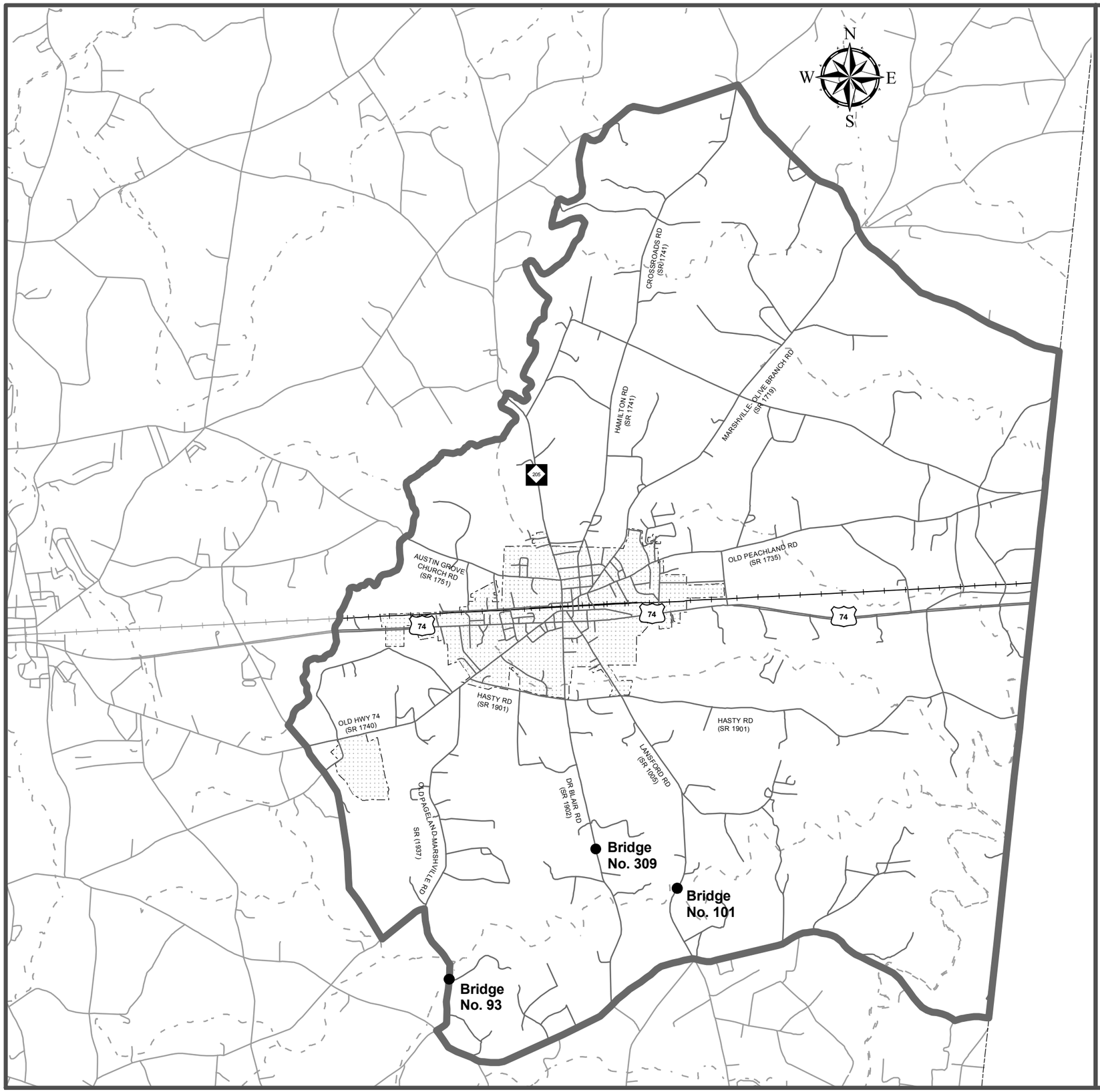


Figure 5

Deficient Bridges

Legend

- Functionally Obsolete Bridges
- Roads
- Railroad
- Rivers & Streams
- Planning Boundary
- Town Boundary
- County Boundary

Town of

Marshville

UNION COUNTY
North Carolina

PREPARED BY THE
NORTH CAROLINA DEPARMENT OF TRANSPORATION
TRANSPORTATION PLANNING BRANCH

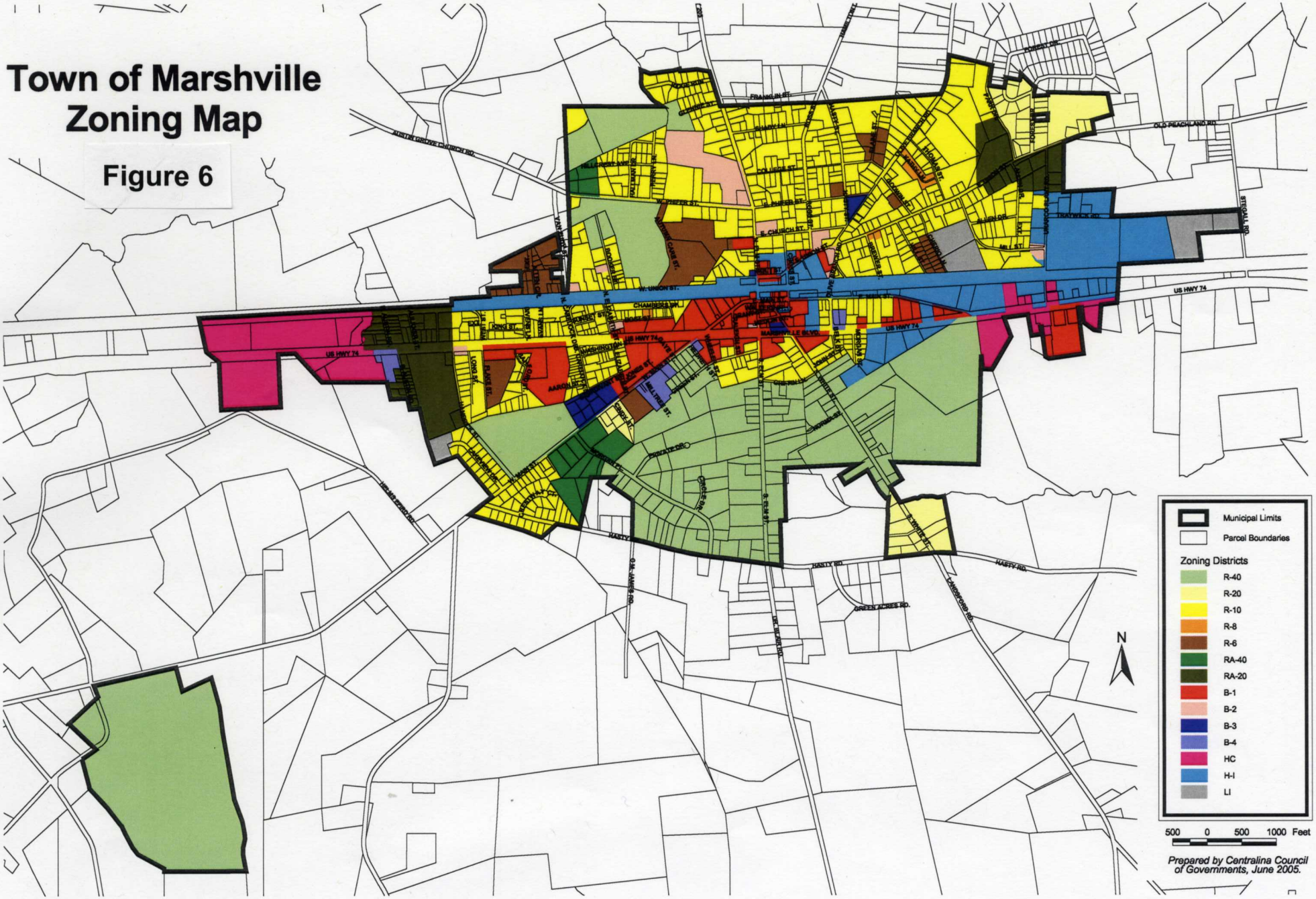
0 0.25 0.5 1 1.5 Miles

Base map date: April, 2005

Refer to CTP document for more details

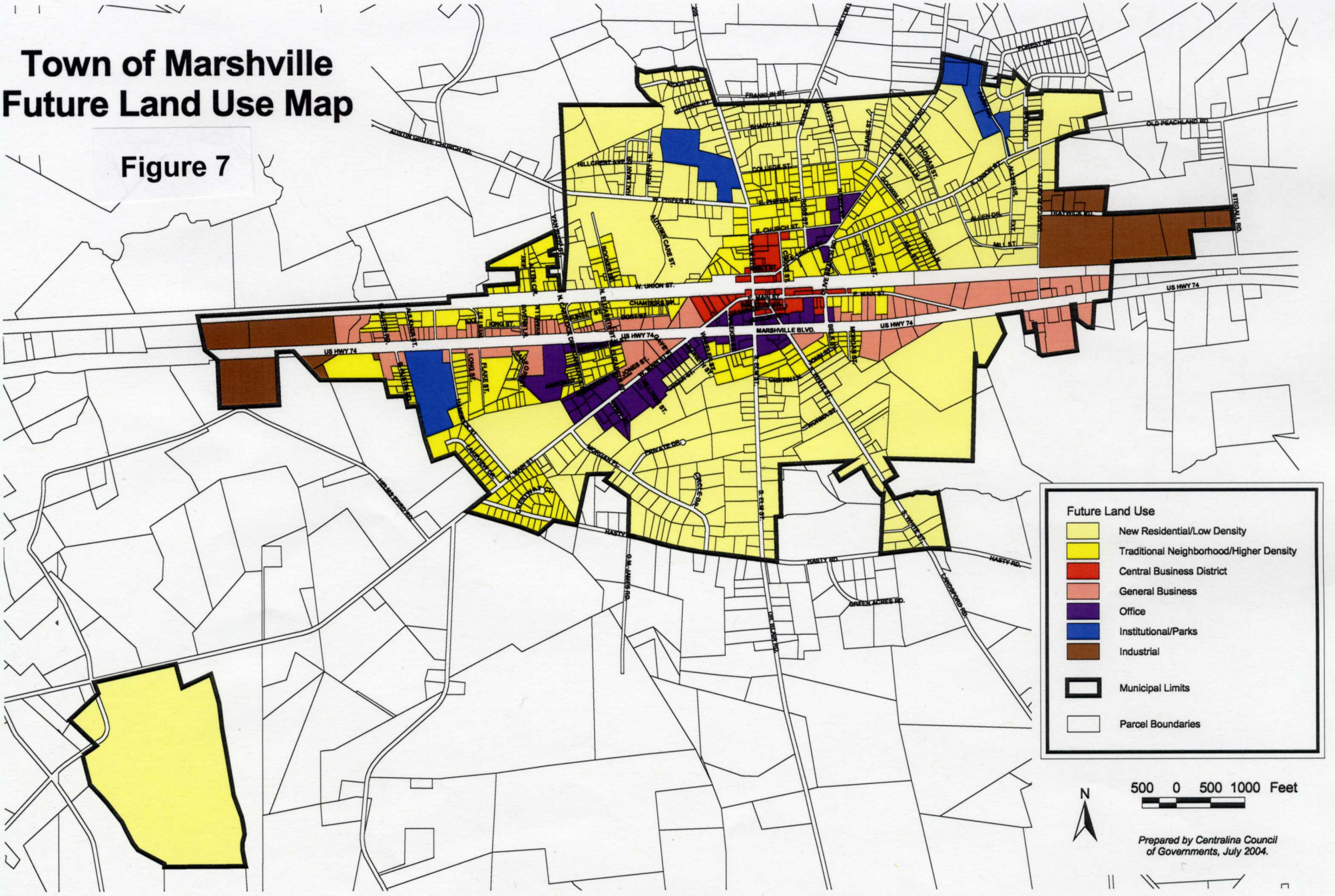
Town of Marshville Zoning Map

Figure 6



Town of Marshville
Future Land Use Map

Figure 7



Consideration of Natural and Human Environment

In recent years, the environmental considerations have come to the forefront of the transportation planning process. Section 102 of the National Environmental Policy Act (NEPA) requires consideration of impacts on wetlands, wildlife, water quality, historic properties, and public lands. While a full NEPA evaluation was not conducted as part of the CTP, potential impacts to these resources were identified as a part of the project recommendations in Chapter 1 of this report. Prior to implementing transportation recommendations of the CTP, a more detailed environmental study would need to be completed in cooperation with the appropriate environmental resource agencies.

A full listing of environmental features that were examined as a part of this study is shown in the following table. Environmental features occurring within the planning area are shown in Figure 8.

Table 1 – Environmental Features

- Air Quality Pollution Discharge Points
- Ambient Water Quality Monitoring Sites
- Anadromous Fish Spawning Areas
- Animal Operation Permits
- Artificial Marine Reefs
- Beach Access Sites
- Benthic Monitoring Results
- Bottom Sediment Sampling Sites
- Cemeteries
- Churches
- Citizen Water Quality Monitoring Sites
- Closed Shellfish Harvesting Areas
- Coastal Reserves
- Conditionally Approved Shellfish Harvesting Areas
- Conservation Easements, US Fish & Wildlife Service
- Conservation Tax Credit Properties
- Discharger Coalitions' Monitoring Sites
- Ecosystem Enhancement Program (EEP) Local Watershed Plans, 2004
- Ecosystem Enhancement Program (EEP) Targeted Local Watersheds, 2004
- Federal Land Ownership
- Fish Community Sampling Sites
- Fisheries Nursery Areas
- Game Lands – Wildlife Resources Commission
- Groundwater Incidents, unverified
- Groundwater Recharge/Discharge
- Hazardous Substance Disposal Sites
- Hazardous Waste Facilities
- Heavy Metal & Organic-Rich Mud Pollutant Sample Sites
- High Quality Water and Outstanding Resource Water Management Zones
- Hurricane Storm Surge Inundation Areas
- Land Trust Conservation Properties
- Land Trust Priority Areas
- Lands Managed for Conservation & Open Space
- Macrosite Boundaries
- Megasite Boundaries
- National Pollutant Discharge Elimination System Sites (NPDES) – Major and Minor

Table 1 – Environmental Features (cont.)

- National Wetlands Inventory
- North Carolina Coastal Region Evaluation of Wetland Significance (NC-CREWS)Public Water Supply Water Sources
- Recreation Projects – Land and Water
- Conservation Fund
- Shellfish Strata
- Significant Aquatic Endangered Species Habitats
- Solid Waste Facilities
- State Parks
- Submersed Rooted Vasculars
- Surface Water Intakes
- Trout Streams (DWQ)
- Water Distribution Systems – Water Treatment Plants
- Water Supply Watersheds
- Well Ground Water Intakes

Additionally, the following environmental features were considered but are not mapped due to restrictions associated with the sensitivity of the data.

Table 2 – Restricted Environmental Features

- Archaeological Sites
- Dedicated Nature Preserves and Registered Heritage Areas
- Historic National Register Districts
- Historic National Register Structures
- Historic Study List Districts Historic Study List Structures
- Managed Areas National Heritage Element Occurrences
- Significant Natural Heritage Areas

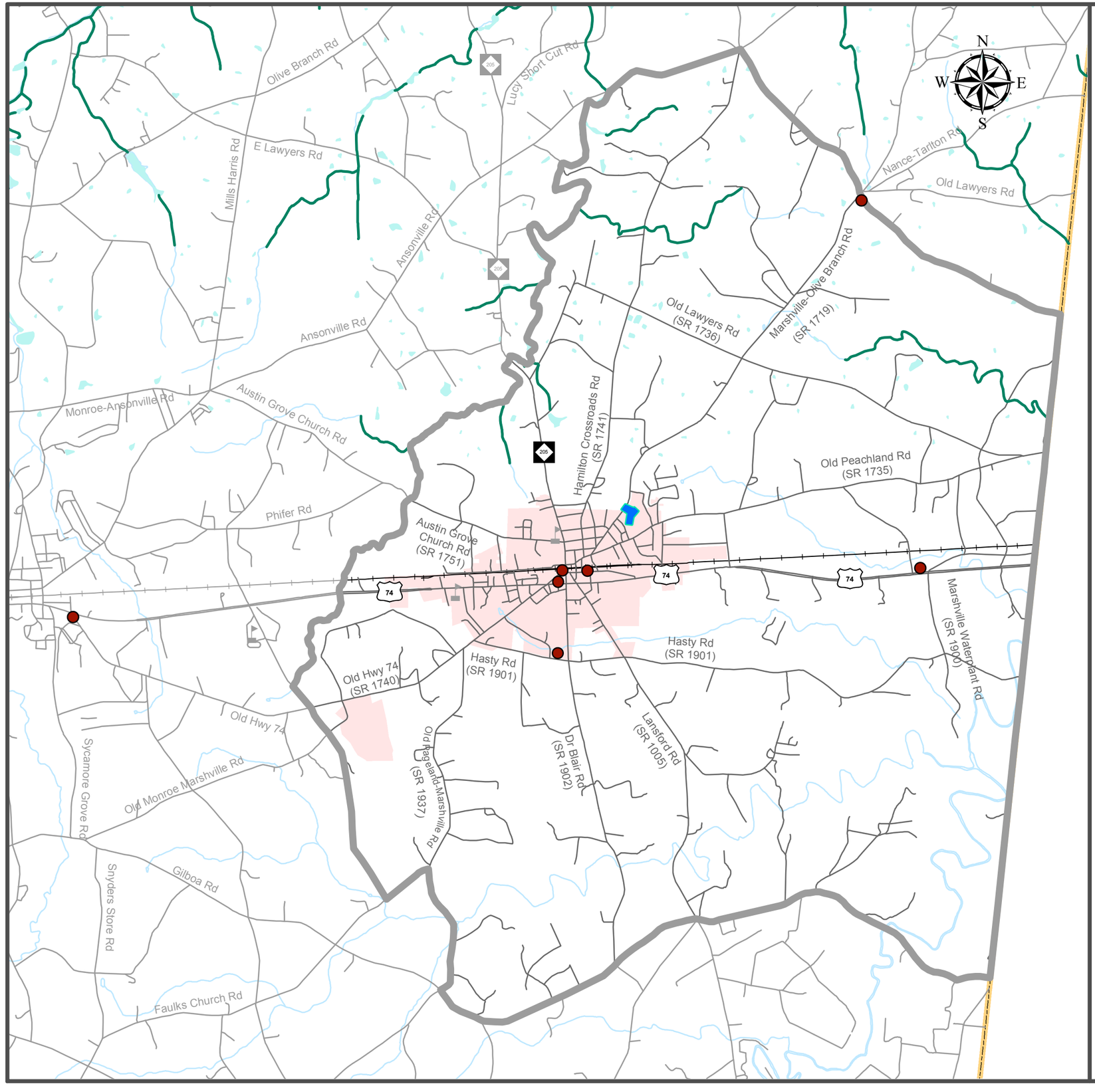


Figure 8

Environmental Features

Legend

- Groundwater Incidents
- Schools
- Planning Boundary
- National Wetlands
- Land & Water Conservation Fund
- National Wetlands Areas
- Roads
- Railroads
- Rivers & Streams
- Town Boundary
- County Boundary

Town of

Marshville

UNION COUNTY
North Carolina

PREPARED BY THE
NORTH CAROLINA DEPARMENT OF TRANSPORATION
TRANSPORTATION PLANNING BRANCH

0 0.25 0.5 1 1.5 Miles

Base map date: April, 2005

Refer to CTP document for more details

Public Involvement

Public involvement is a key element in the transportation planning process. Adequate documentation of this process is essential for a seamless transfer of information from systems planning to project planning and design.

The Rocky River RPO requested the development of a comprehensive transportation plan for the Town of Marshville through a prioritized list of regional needs. A letter dated February 3, 2005, was sent to NCDOT to officially request the study. A meeting was held with the Town of Marshville on May 19, 2005 to formally initiate the study, to provide an overview of the transportation planning process, and to gather input on area transportation needs.

Throughout the course of the study, the Transportation Planning Branch cooperatively worked with the Town Administrator and Council to provide information on current local plans, to discuss population and employment projections, and to develop proposed CTP recommendations.

The public involvement process included holding two public drop-in sessions in the Town of Marshville to present the proposed CTP to the public and solicit comments. The first session was held on September 20, 2008 at the Boll Weevil Jamboree Festival and the second session was held on October 23, 2008 at the Marshville Town Hall. Both sessions were publicized in the local newspaper. Eight comment forms were submitted during the second session held on October 23, 2008.

A public hearing was held on November 17, 2008 during the Marshville Town Council meeting. The purpose of this meeting was to discuss the plan recommendations and to solicit further input from the public. The CTP was adopted after this meeting on December 8, 2008.

The Rocky River RPO endorsed the CTP on January 15, 2009. The North Carolina Board of Transportation voted to mutually adopt the Marshville CTP on June 4, 2009.

APPENDICES

Appendix A
Resources and Contacts

North Carolina Department of Transportation

Customer Service Office

Contact information for other units within the NCDOT that are not listed in this appendix is available by calling the Customer Service Office or by visiting the NCDOT homepage:

1-877-DOT-4YOU
(1-877-368-4968)
https://apps.dot.state.nc.us/dot/directory/authenticated/ToC.aspx

Secretary of Transportation

Eugene A. Conti, Jr., Ph.D.
1501 Mail Service Center
Raleigh, NC 27699-1501
(919) 733-2520
gconti@ncdot.gov
http://www.ncdot.org/about/leadership/secretary.html

Board of Transportation Member

John Collett
1111 Metropolitan Avenue, Suite 700
Charlotte, NC 28204
(704) 206-8300
jcolltett@ncdot.gov
http://www.ncdot.gov/about/board/default.html

Highway Division Engineer

Contact the Division Engineer with general questions concerning NCDOT activities within each Division and for information on Small Urban Funds.

Mr. Barry Moose, PE
716 W. Main Street
Albemarle, NC 28001
(704) 982-0101
bmoose@ncdot.gov
http://www.ncdot.gov/doh/operations/division10/

Division Project Manager

Contact the Division Project Manager with questions concerning transportation projects within each Division.

Mr. Ritchie Hearne, PE
716 W. Main Street
Albemarle, NC 28001
(704) 982-0101
rhearne@ncdot.gov

Division Construction Engineer

Contact the Division Construction Engineer for information concerning major roadway improvements under construction.

Ms. Tawana Brooks, PE
716 W. Main Street
Albemarle, NC 28001
(704) 982-0101
jblair@ncdot.gov

Division Traffic Engineer

Contact the Division Traffic Engineer for information concerning traffic signals, highway signs, pavement markings and crash history.

Mr. J. Scott Cole, PE
716 W. Main Street
Albemarle, NC 28001
(704) 982-0101
scole@ncdot.gov

Division Operations Engineer

Contact the Division Operations Engineer for information concerning facility operations.

Mr. Tim Boland, PE
716 W. Main Street
Albemarle, NC 28001
(704) 982-0101
tboland@ncdot.gov

Division Maintenance Engineer

Contact the Division Maintenance Engineer information regarding maintenance of all state roadways, improvement of secondary roads and other small improvement projects. The Division Maintenance Engineer also oversees the District Offices, the Bridge Maintenance Unit and the Equipment Unit.

Mr. Philip Moxley, PE
716 W. Main Street
Albemarle, NC 28001
(704) 982-0101
ptmoxley@ncdot.gov

District Engineer

Contact the District Engineer for information on outdoor advertising, junkyard control, driveway permits, road additions, subdivision review and approval, Adopt A Highway program, encroachments on highway right of way, issuance of oversize/overwidth permits, paving priorities, secondary road construction program and road maintenance.

Mr. John Underwood
130 S. Sutherland Street
Monroe, NC 28112
(704) 289-1397
junderwood@ncdot.gov

Transportation Planning Branch (TPB)

Contact the Transportation Planning Branch for information on long-range multi-modal planning services.

1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705
http://www.ncdot.gov/doh/preconstruct/tpb/

Rocky River Rural Planning Organization (RPO)

Contact the RPO for information on long-range multi-modal planning services.

Ms. Dana Stoogenke, AICP
1000 N. Street
Albemarle, NC 28001
(704) 986-3876
dstoogenke@rockyriverrpo.org
http://www.rockyriverrpo.org

Strategic Planning Office

Contact the Strategic Planning Office for information concerning prioritization of transportation projects.

Mr. Don Voelker
1501 Mail Service Center
Raleigh, NC 27699-1501
(919) 715-0951
djvoelker@ncdot.gov
https://apps.dot.state.nc.us/dot/directory/authenticated/UnitPage.aspx?id=11054

Project Development & Environmental Branch (PDEA)

Contact PDEA for information on environmental studies for projects that are included in the TIP.

1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 733-3141
http://www.ncdot.gov/doh/preconstruct/pe/

Secondary Roads Office

Contact the Secondary Roads Office for information regarding the status for unpaved roads to be paved, additions and deletions of roads to the State maintained system and the Industrial Access Funds program.

1535 Mail Service Center
Raleigh, NC 27699-1535
(919) 733-3250
http://www.ncdot.gov/doh/operations/secondaryroads/

Program Development Branch

Contact the Program Development Branch for information concerning Roadway Official Corridor Maps, Feasibility Studies and the Transportation Improvement Program (TIP).

1534 Mail Service Center
Raleigh, NC 27699-1534
(919) 733-2039
http://www.ncdot.org/planning/development/

Public Transportation Division

Contact the Public Transportation Division for information public transit systems.

1550 Mail Service Center
Raleigh, NC 27699-1550
(919) 733-4713
http://www.ncdot.org/transit/nctransit/

Rail Division

Contact the Rail Division for rail information throughout the state.

1553 Mail Service Center
Raleigh, NC 27699-1553
(919) 733-7245
http://www.bytrain.org/

Division of Bicycle and Pedestrian Transportation

Contact this Division for bicycle and pedestrian transportation information throughout the state.

1552 Mail Service Center
Raleigh, NC 27699-1552
(919) 807-0777
http://www.ncdot.gov/transit/bicycle/

Bridge Maintenance Unit

Contact the Bridge Maintenance Unit for information on bridge management throughout the state.

1565 Mail Service Center
Raleigh, NC 27699-1565
(919) 733-4362
http://www.ncdot.gov/doh/operations/dp_chief_eng/maintenance/bridge/

Highway Design Branch

The Highway Design Branch consists of the Roadway Design, Structure Design, Photogrammetry, Location & Surveys, Geotechnical, and Hydraulics Units. Contact the Highway Design Branch for information regarding design plans and proposals for road and bridge projects throughout the state.

1584 Mail Service Center
Raleigh, NC 27699-1584
(919) 250-4001
http://www.ncdot.gov/doh/preconstruct/highway/

Other State Government Offices

Department of Commerce – Division of Community Assistance

Contact the Department of Commerce for resources and services to help realize economic prosperity, plan for new growth and address community needs.

http://www.nccommerce.com/en/CommunityServices/

Appendix B
Comprehensive Transportation Plan Definitions

Highway Map

For visual depiction of facility types for the following CTP classification, visit http://www.ncdot.gov/doh/preconstruct/tpb/SHC/facility/.

Facility Type Definitions

- **Freeways**
  - Functional purpose – high mobility, high volume, high speed
  - Posted speed – 55 mph or greater
  - Cross section – minimum four lanes with continuous median
  - Multi-modal elements – High Occupancy Vehicles (HOV)/High Occupancy Transit (HOT) lanes, busways, truck lanes, park-and-ride facilities at/near interchanges, adjacent shared use paths (separate from roadway and outside ROW)
  - Type of access control – full control of access
  - Access management – interchange spacing (urban – one mile; non-urban – three miles); at interchanges on the intersecting roadway, full control of access for 1,000ft or for 350ft plus 650ft island or median; use of frontage roads, rear service roads
  - Intersecting facilities – interchange or grade separation (no signals or at-grade intersections)
  - Driveways – not allowed

- **Expressways**
  - Functional purpose – high mobility, high volume, medium-high speed
  - Posted speed – 45 to 60 mph
  - Cross section – minimum four lanes with median
  - Multi-modal elements – HOV lanes, busways, very wide paved shoulders (rural), shared use paths (separate from roadway but within ROW)
  - Type of access control – limited or partial control of access;
  - Access management – minimum interchange/intersection spacing 2,000ft; median breaks only at intersections with minor roadways or to permit U-turns; use of frontage roads, rear service roads; driveways limited in location and number; use of acceleration/deceleration or right turning lanes
  - Intersecting facilities – interchange; at-grade intersection for minor roadways; right-in/right-out and/or left-over or grade separation (no signalization for through traffic)
  - Driveways – right-in/right-out only; direct driveway access via service roads or other alternate connections

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

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

- **Minor Thoroughfares**
  - Functional purpose – balanced mobility and access, moderate volume, low to medium speed
  - Posted speed – 25 to 45 mph
  - Cross section – ultimately three lanes (no more than one lane per direction) or less without median
  - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
  - ROW – no control of access

- Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
- Intersecting facilities – intersections and driveways
- Driveways – full movement on two lane with center turn lane as permitted by the current NCDOT *Driveway Manual*

Other Highway Map Definitions

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

Public Transportation and Rail Map

- **Bus Routes** – The primary fixed route bus system for the area. Does not include demand response systems.
- **Fixed Guideway** – Any transit service that uses exclusive or controlled rights-of-way or rails, entirely or in part. The term includes heavy rail, commuter rail, light rail, monorail, trolleybus, aerial tramway, included plane, cable car, automated guideway transit, and ferryboats.

- **Operational Strategies** – Plans geared toward the non-single occupant vehicle. This includes but is not limited to HOV lanes or express bus service.
- **Rail Corridor** – Locations of railroad tracks that are either active or inactive tracks. These tracks were used for either freight or passenger service.
  - Active – rail service is currently provided in the corridor; may include freight and/or passenger service
  - Inactive – right of way exists; however, there is no service currently provided; tracks may or may not exist
  - Recommended – It is desirable for future rail to be considered to serve an area.
- **High Speed Rail Corridor** – Corridor designated by the U.S. Department of Transportation as a potential high speed rail corridor.
  - Existing – Corridor where high speed rail service is provided (there are currently no existing high speed corridor in North Carolina).
  - Recommended – Proposed corridor for high speed rail service.
- **Rail Stop** – A railroad station or stop along the railroad tracks.
- **Intermodal Connector** – A location where more than one mode of public transportation meet such as where light rail and a bus route come together in one location or a bus station.
- **Park and Ride Lot** – A strategically located parking lot that is free of charge to anyone who parks a vehicle and commutes by transit or in a carpool.

Bicycle Map

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

may also include greenway segments that do not necessarily serve a transportation function but intersect recommended facilities on the highway map or public transportation and rail map.

Pedestrian Map

- **Sidewalk-Existing** – Paved paths (including but not limited to concrete, asphalt, brick, stone, or wood) on both sides of a highway facility and within the highway right-of-way that are adequate to safely accommodate pedestrian traffic.
- **Sidewalk-Needs Improvement** – Improvements are needed to provide paved paths on both sides of a highway facility. The highway facility may or may not need improvements. Improvements do not include re-paving or other maintenance activities but may include: filling in gaps, widening sidewalks, or meeting ADA (Americans with Disabilities Act) requirements.
- **Sidewalk-Recommended** – At the systems level, it is desirable for a recommended highway facility to accommodate pedestrian transportation **or** to add sidewalks on an existing facility where no sidewalks currently exist. The highway should be designed and built to safely accommodate pedestrian traffic.
- **Off Road-Existing** – A facility that accommodates only pedestrian traffic and is physically separated from a highway facility usually within an independent right-of-way.
- **Off Road-Needs Improvement** – A facility that accommodates only pedestrian traffic and is physically separated from a highway facility usually within an independent right-of-way that will not adequately serve future pedestrian needs. Improvements may include but are not limited to, widening, paving (not re-paving or other maintenance activities), improved horizontal or vertical alignment, and meeting ADA requirements.
- **Off Road-Recommended** – A facility needed to accommodate only pedestrian traffic and is physically separated from a highway facility usually within an independent right-of-way.
- **Multi-use Path-Existing** – An existing facility physically separated from motor vehicle traffic that is either within the highway right-of-way or on an independent right-of-way that serves bicycle and pedestrian traffic. Sidewalks should not be designated as a multi-use path.
- **Multi-use Path-Needs Improvement** – An existing facility physically separated from motor vehicle traffic that is either within the highway right-of-way or on an independent right-of-way that serves bicycle and pedestrian traffic that will not adequately serve future needs. Improvements may include but are not limited to, widening, paving (not re-paving or other maintenance activities), and improved horizontal or vertical alignment. Sidewalks should not be designated as a multi-use path.

- **Multi-use Path-Recommended** – A facility physically separated from motor vehicle traffic that is either within the highway right-of-way or on an independent right-of-way that is needed to serve bicycle and pedestrian traffic. Sidewalks should not be designated as a multi-use path.
- **Existing Grade Separation** – Locations where existing "Off Road" facilities and "Multi-use Paths" are physically separated from existing highways, railroads, or other transportation facilities. These may be bridges, culverts, or other structures.
- **Proposed Grade Separation** – Locations where "Off Road" facilities and "Multi-use Paths" are recommended to be physically separated from existing or recommended highways, railroads, or other transportation facilities. These may be bridges, culverts, or other structures.

Appendix C
CTP Inventory and Recommendations

Assumptions/ Notes:

- **ID:** If a TIP project number exists it is listed as the ID. Otherwise, the following system is used to create a code for each recommended improvement (this code is the same as the one used as the SPOT prioritization tool ID): the first 4 letters of the county name is combined with a 4 digit unique numerical code followed by '-H' for highway, '-T' for public transportation, '-R' for rail, '-B' for bicycle, or '-P' for pedestrian modes. If a different code is used along a route it indicates separate projects will probably be requested. Also, upper case alphabetic characters (i.e. 'A', 'B', or 'C') are included after the numeric portion of the code if it is anticipated that project segmentation or phasing will be recommended.

- **Jurisdiction:** Jurisdictions listed are based on municipal limits, county boundaries, and MPO Metropolitan Planning Area Boundaries (MAB), as applicable.

- **Cross-Section:** Listed under '(ft)' is the approximate width of the roadway from edge of pavement to edge of pavement. Listed under 'lanes' is the total number of lanes, with the letter 'D' if the facility is divided.

- **ROW:** The estimated existing right-of-way is based on the NCDOT Roadway Inventory, refer to Appendix D. These right-of-way amounts are approximate and may vary.

- **Existing and Proposed Capacity:** The estimated capacities are given in vehicles per day (vpd) based on LOS D for existing facilities and LOS C for new facilities. These capacity estimates were developed using the NC Level of Service Program, as documented in Chapter II. The Proposed Capacity is shown in bold if it does not meet or exceed the 2030 AADT with CTP.

- **Existing and Proposed AADT** (Annual Average Daily Traffic) volumes, given in vehicles per day (vpd), are estimates only based on a systems-level analysis. The '2004 No Build AADT' is an estimate of the volume in 2004 with no additional facilities/ improvements assumed to be in place that were not open to traffic in the base year (2004). The '2030 AADT with CTP' is an estimate of the volume in 2030 with all proposed CTP improvements assumed to be in place. For additional information about the assumptions and techniques used to develop the AADT volume estimates, refer to Chapter II.

- **Rec. (Recommended) Cross-section:** The CTP recommended cross-sections are listed by code; for depiction of the cross-section, refer to Appendix D. An entry of 'ADQ' indicates the existing facility is adequate and there are no improvements recommended as part of the CTP.

- **CTP Classification:** The CTP classification is listed, as shown on the adopted CTP Maps (see Figure 1). Abbreviations are F= freeway, E= expressway, B= boulevard, Maj= other major thoroughfare, Min= minor thoroughfare.

- **Tier:** Tiers are defined as part of the North Carolina Mulitmodal Investment Network (NCMIN). Abbreviations are Sta= statewide tier, Reg= regional tier, Sub= subregional tier.

- **Other Modes:** If there is an improvement recommended for another mode of transportation that relates to the given recommendation, it is indicated by an alphabetic code (H=highway, T= public transportation, R= rail, B= bicycle, and P= pedestrian).

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY

ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	2004 Existing System: Cross-Section (ft)	2004 Existing System: Cross-Section lanes	2004 Existing System: ROW (ft)	2004 Existing System: Speed Limit (mph)	2004 Existing System: Existing Capacity (vpd)	2004 Existing System: 2004 AADT	2030 Proposed System: 2030 AADT No Build	2030 Proposed System: 2030 AADT with CTP	2030 Proposed System: Proposed Capacity (vpd)	2030 Proposed System: Rec. Cross-Section	2030 Proposed System: ROW (ft)	CTP Classification	Tier	Other Modes
	US 74	Salem Creek - Faulkner St.	Marshville	0.44	48	4	100	45	42100	17000	32200	8300	42100	ADQ	100	B	Sta	---
	US 74	Faulkner St. - SR 1734	Marshville	2.51	60	5	100	35	29100	18000	35100	11200	29100	ADQ	100	B	Sta	---
	US 74	SR 1734 - Proposed Interchange	Union	1.1	48	4	100	45	29100	18000	35100	11200	29100	ADQ	100	B	Sta	---
UNIO0001-H	**US 74**	Proposed Interchange - Union/Anson Co. Line	Union	1.67	48	4	100	55	42100	13100	34800	11800	42100	ADQ	100	F	Sta	---
UNIO0001-H	**US 74 Bypass**	SR 1754 - US 74/Proposed Interchange	Union	4.9	---	---	---	---	---	---	---	23800	**44200**	A	250	F	Sta	---
UNIO0002-H	**NC 205 North**	US 74 - SR 1237	Marshville	0.65	26	2	50	35	14500	3000	4500	4500	**14500**	K	50	Maj	Reg	---
UNIO0002-H	**NC 205 North**	SR 1237 - Marshville Planning Area Boundary	Union	1.3	22	2	50	55	14500	1300	3300	3300	**16700**	K	50	Maj	Reg	---
UNIO0003-H	**Austin Grove Chruch Rd. (SR 1751)**	NC 205 - Salem Creek/Marshville PAB	Marshville	0.96	18	2	50	35	16600	1500	3000	3000	**16600**	K	50	Min	Sub	---
UNIO0004-H	**Main St. (SR 1740)**	US 74 - US 74	Marshville	0.82	20	2	50	35	16800	4500	5500	5500	**16800**	K	50	Min	Sub	---
	Hamilton-Crossroads Rd. (SR 1741)	SR 1735 - SR 1246	Union	0.41	36	2	60	35	16700	400	1200	1200	16700	ADQ	60	Min	Sub	---
	Hamilton-Crossroads Rd. (SR 1741)	SR 1246 - Marshville Planning Area Boundary	Union	4.1	20	2	60	55	16700	400	1200	1200	16700	ADQ	60	Min	Sub	---
UNIO0005-H	**Olive Branch Rd. (SR 1719)**	SR 1735 - SR 1401	Union	0.43	20	2	50	35	16700	3200	5300	5300	**16700**	K	50	Min	Sub	---
UNIO0005-H	**Olive Branch Rd. (SR 1719)**	SR 1401 - Marshville Planning Area Boundary	Union	3.22	20	2	50	55	16700	3200	5300	5300	**16700**	K	50	Min	Sub	---
	Old Peachland Rd. (SR 1735)	NC 205 North - Union/Anson Co. Line	Union	3.3	20	2	50	45	16700	700	1000	1000	16700	ADQ	50	Min	Sub	---
UNIO0006-H	**Hasty Rd. (SR 1901)**	SR 1740 - Union/Anson Co. Line	Union	4.8	20	2	60	45	16700	700	1300	1300	**16700**	K	60	Min	Sub	---
UNIO0007-H	**Landsford Rd. (SR 1005)**	Main St. - Marshville Planning Area Boundary	Union	3.1	22	2	50	45	16700	3000	4000	3100	**16700**	K	50	Min	Sub	---
	Dr. Blair Rd. (SR 1902)	US 74 - Marshville Planning Area Boundary	Union	3.2	18	2	60	45	16800	300	800	800	16800	ADQ	60	Min	Sub	---
	Old Marshville Rd. (SR 1937)	Before SR 1740 - Marshvile Planning Area Boundary	Union	1.95	18	2	40	55	16700	800	2000	2000	16700	ADQ	40	Min	Sub	---

PUBLIC TRANSPORTATION

ID	Facility/ Route	Section (From - To)	Speed Limit (mph)	Distance (mi)	Existing System Type	Proposed System Type	Other Modes
UNIO0001-T	**CATS Commuter Bus Service - US 74X Route**	Downtown Marshville - Charlotte	35 to 55	32.5 (65 total)	Bus	---	H

RAIL

ID	Facility/ Route	Section (From - To)	Class	Speed Limit (mph)	Distance (mi)	Existing System Type	Existing System ROW (ft)	Existing System Trains per day	Proposed System Type	Proposed System ROW (ft)	Proposed System Trains per day	Other Modes
UNIO0001-R	**CSX Railroad (CSX Line)**	Salem Creek - Union/Anson Co. Line	I	60	5.67	Freight	200	15	---	---	---	---

Appendix D
Typical Cross Sections

Cross section requirements for roadways vary according to the capacity and level of service to be provided. Universal standards in the design of roadways 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. 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 roadways delineated on the CTP, 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, Appendix C may recommend ultimate needed right-of-way for the following situations:

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

Typical Cross Sections

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 where 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 certain cases, grass or landscaped medians result in greatly increased maintenance costs and an increase danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

F: Four Lanes Divided - 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 and 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 likely be required at major intersections. This cross section should be used only if the above criteria are 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 and Gutter

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

I: Two Lanes – Curb and Gutter, Parking both sides
J: Two Lanes – Curb and Gutter, Parking one side

Cross section “I” and “J” are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross-section “I” would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

K: Two Lanes - Paved Shoulder

Cross section "K" is used in rural areas or for staged construction of a wider multilane 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 grass median is the minimum desirable width, but variation from this may be permissible depending upon design considerations. Right-of-way requirements are typically 228 ft or greater, depending upon cut and fill requirements.

M: Eight Lanes Divided with Raised Median - Curb and 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 with Curb & Gutter, Widened Curb Lanes
O: Two Lanes/Shoulder Section
P: Four Lanes Divided with Raised Median – Curb & Gutter, 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 encompassing 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 roadway construction.

Bicycle Cross Sections

Cross sections B-1, B-2, B-3, B-4, and B-5 are typical bicycle cross sections. Contact the NCDOT Division of Bicycle and Pedestrian Transportation for more information regarding these cross-sections.

B-1: Four Lanes Divided with Wide Outside Lanes
B-2: Five Lanes with Wide Outside Lanes

A widened outside lane is an effective way to accommodate bicyclists riding in the same lane with motor vehicles. With a wide outside lane, motorists do not have to change lanes to pass a bicyclist. The additional width in the outside lane also improves sight distance and provides more room for vehicles to turn onto the roadway. Therefore, on

roadways with bicycle traffic, widening the outside lane can improve the capacity of that roadway. Also, by widening the outside lane by a few extra feet both motorists and bicyclists have more space in which to maneuver. This facility type is generally considered for use in urban, suburban, and occasionally rural conditions on roadways where there is a curb and gutter. Wide outside lanes can be applied to several different roadway cross sections.

B-3: Bicycle Lanes on Collector Streets

Bicycle lanes may be considered when it is desirable to delineate road space for preferential use by cyclists. Streets striped with bicycle lanes should be part of a connected bikeway system rather than being an isolated feature. Bicycle lanes function most effectively in mid-block situations by separating bicyclists from overtaking motor vehicles. Integrating bicyclists into complicated intersection traffic patterns can sometimes be problematic. Strip development areas, or roadways with a high number of commercial driveways, tend to be less suitable for bicycle lanes due to frequent and unpredictable motorist turning movements across the path of straight-through cyclists. Striped bike lanes can be effective as a safety treatment, especially for less experienced bicyclists. Two-lane residential/collector streets with lower traffic volume, low-posted speed limit, adequate roadway width for both bike lanes and motor vehicle travel lanes, and an absence of complicated intersections. A median-divided multi-lane roadway with lower traffic volumes and a low volume of right and left turning traffic would be a more appropriate location for bicycle lanes than a high traffic volume undivided multi-lane roadway with a continuous center turn lane. Most bicyclists will choose a route that combines direct access with lower traffic volumes. An origin and destination of less than 4 miles is desirable to generate usage on a facility.

B-4: Wide Paved Shoulders

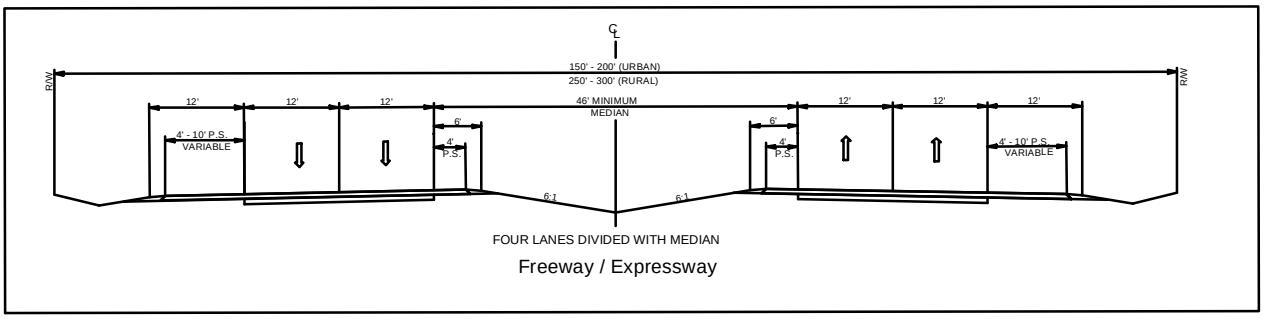
On urban streets with curb and gutter, wide outside lanes and bicycle lanes are usually the preferred facilities. Shoulders for bicycle use are not typically provided on roadways with curb and gutter. On rural roadways where bicycle travel is common, such as roads in coastal resort areas, wide paved shoulders are highly desirable. On secondary roadways without curb and gutter where there are few commercial driveways and intersections with other roadways, many bicyclists prefer riding on wide, smoothly paved shoulders.

B-5: Multi-use Pathway

When properly located, multi-use pathway can be a safer type of facility for novice and child bicyclists because they do not have to share the path with motor vehicles. The design standards used for this cross section provides adequate width for two-directional use by both cyclists and pedestrians, provisions of good sight distance, avoidance of steep grades and tight curves, and minimal cross-flow by motor vehicles. A multi-use pathway can serve a variety of purposes, including recreation and transportation. This pathway should not be located immediately adjacent to a roadway because of safety considerations at intersections with driveways and roads. Sidewalks should never be used as a multi-use pathway.

TYPICAL HIGHWAY CROSS SECTIONS

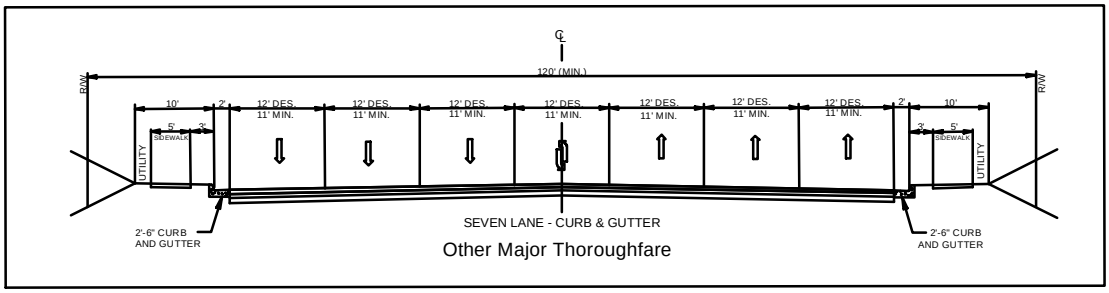
A



FOUR LANES DIVIDED WITH MEDIAN

Freeway / Expressway

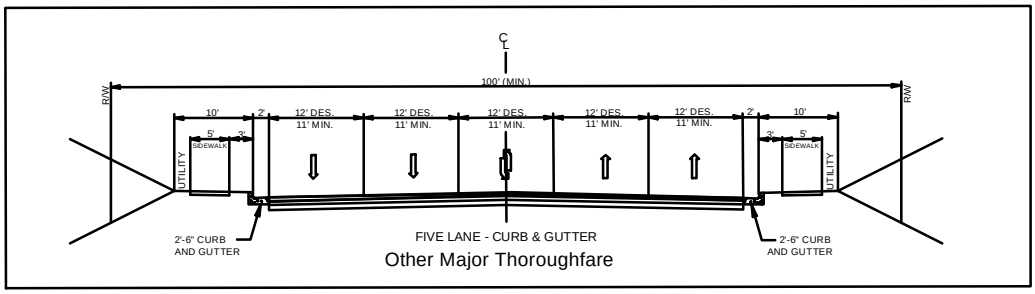
B



SEVEN LANE - CURB & GUTTER

Other Major Thoroughfare

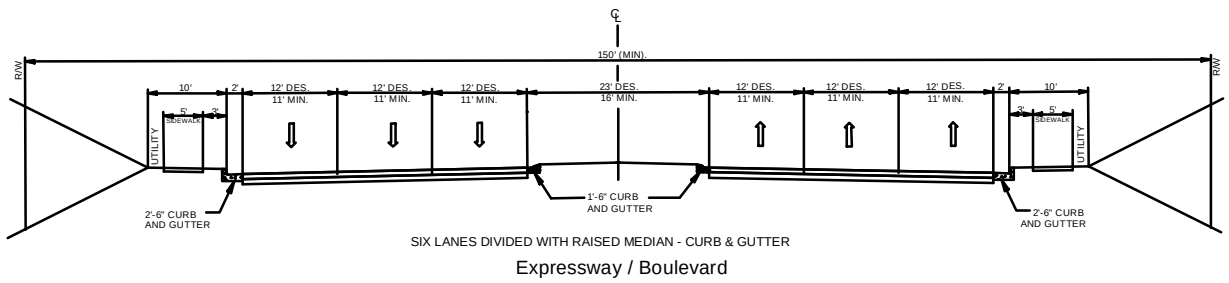
C



FIVE LANE - CURB & GUTTER

Other Major Thoroughfare

D



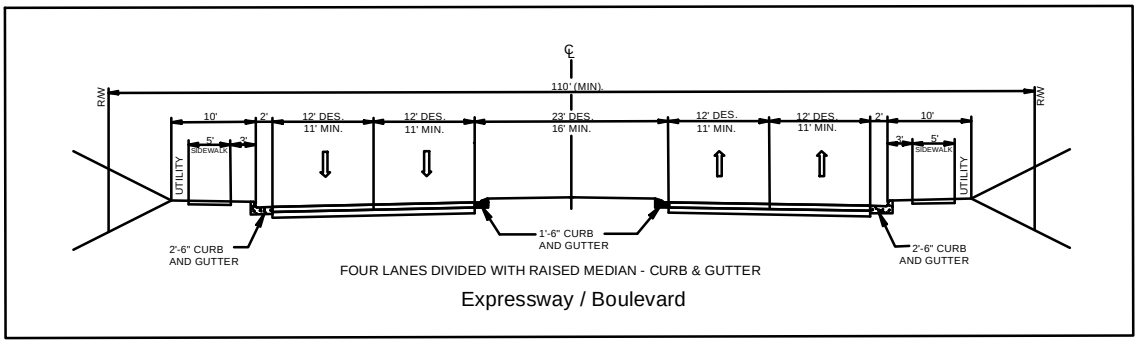
SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

Expressway / Boulevard

revised 04-01-05

TYPICAL HIGHWAY CROSS SECTIONS

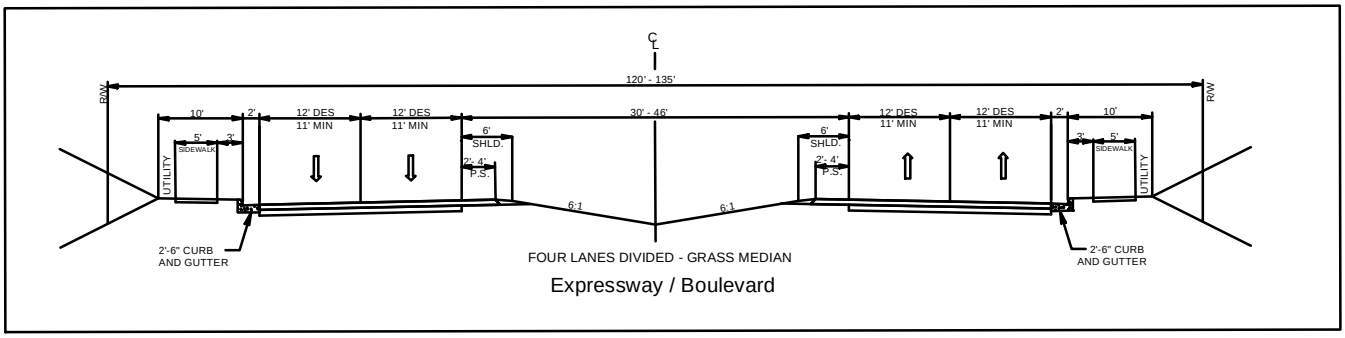
E



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

Expressway / Boulevard

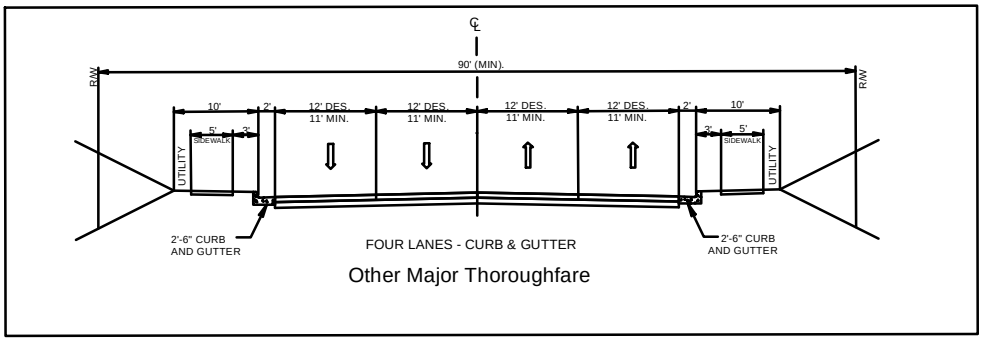
F



FOUR LANES DIVIDED - GRASS MEDIAN

Expressway / Boulevard

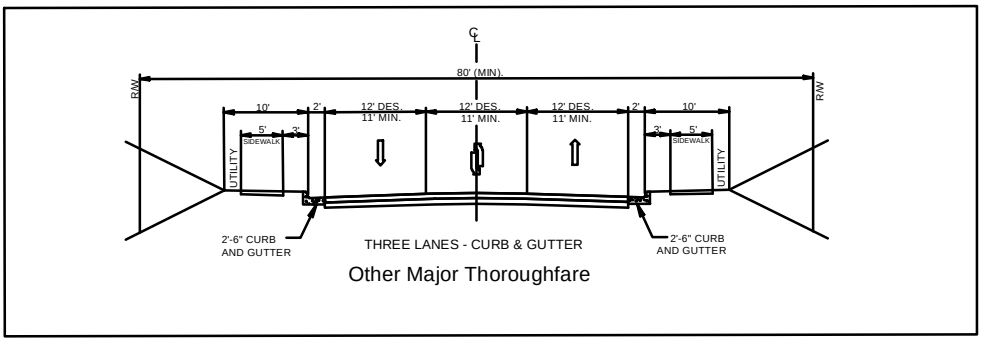
G



FOUR LANES - CURB & GUTTER

Other Major Thoroughfare

H

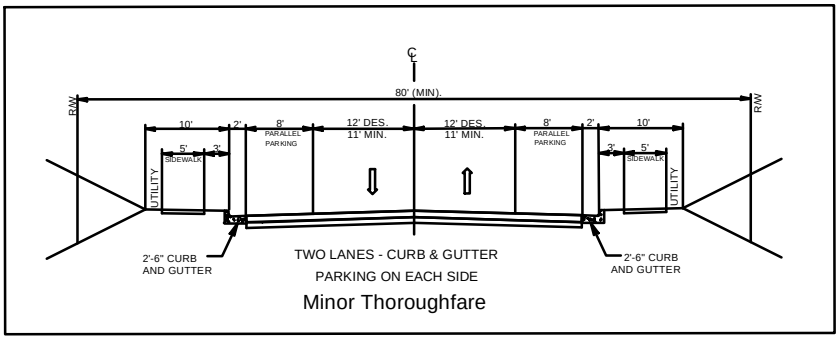


THREE LANES - CURB & GUTTER

Other Major Thoroughfare

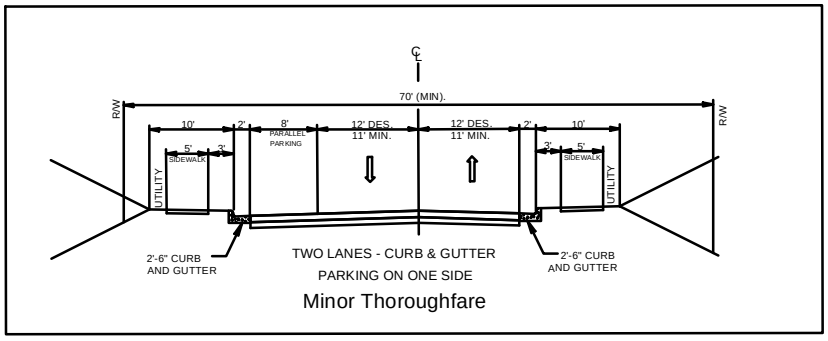
TYPICAL HIGHWAY CROSS SECTIONS

I



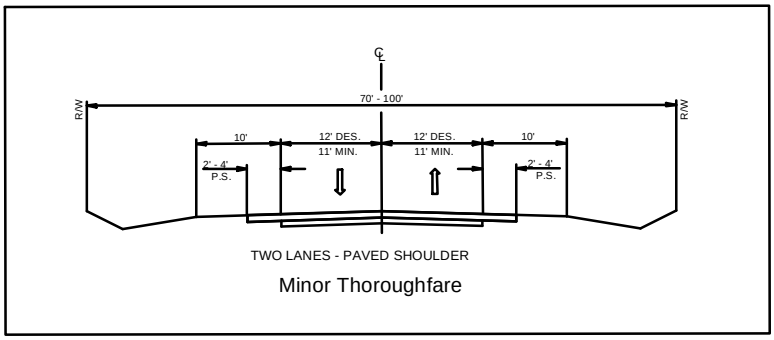
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE
Minor Thoroughfare

J



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

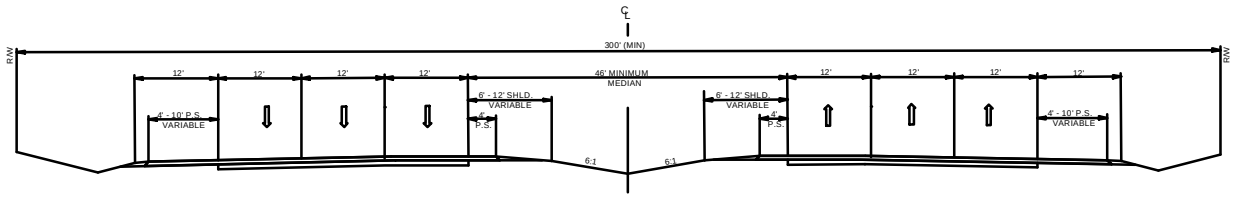
K



TWO LANES - PAVED SHOULDER
Minor Thoroughfare

TYPICAL HIGHWAY CROSS SECTIONS

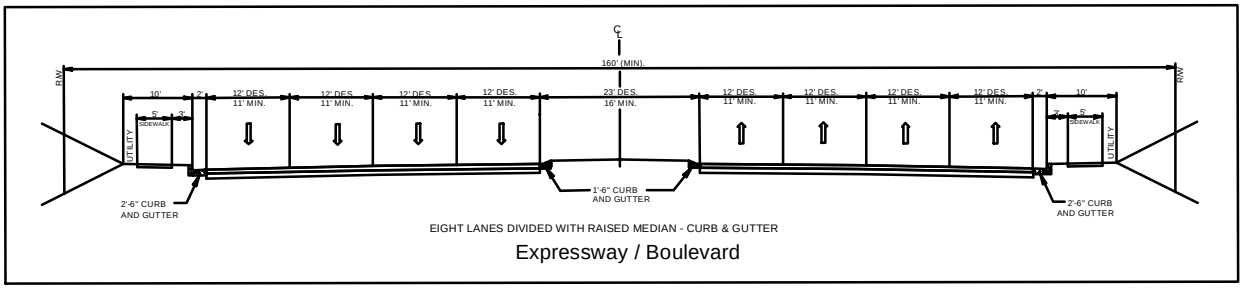
L



SIX LANES DIVIDED WITH GRASS MEDIAN

Freeway / Expressway

M



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

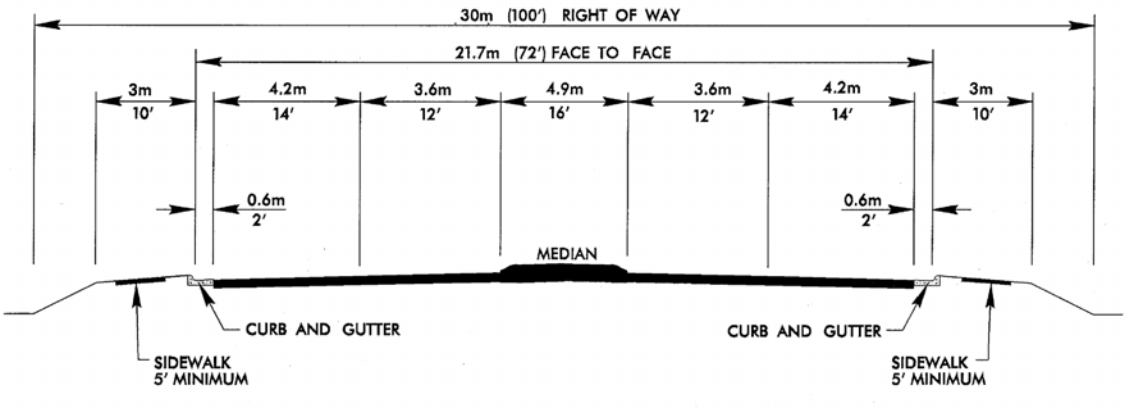
Expressway / Boulevard

Typical Bicycle Cross Sections

WIDE CURB LANES

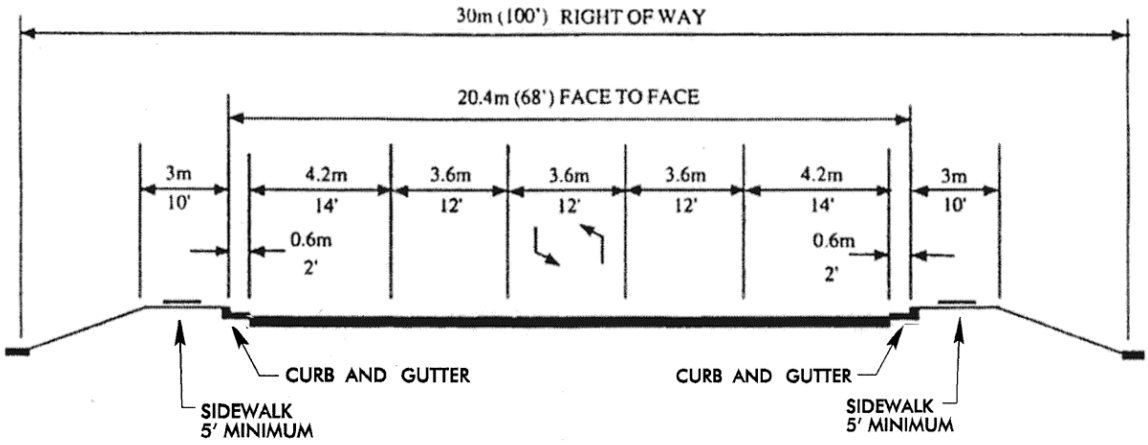
B –1 4-LANE MEDIAN DIVIDED TYPICAL SECTION

With Wide Outside Lanes



B-2 5-LANE TYPICAL SECTION

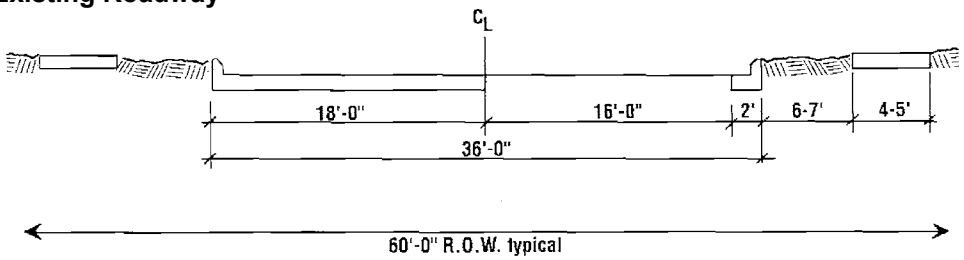
With Wide Outside Lanes



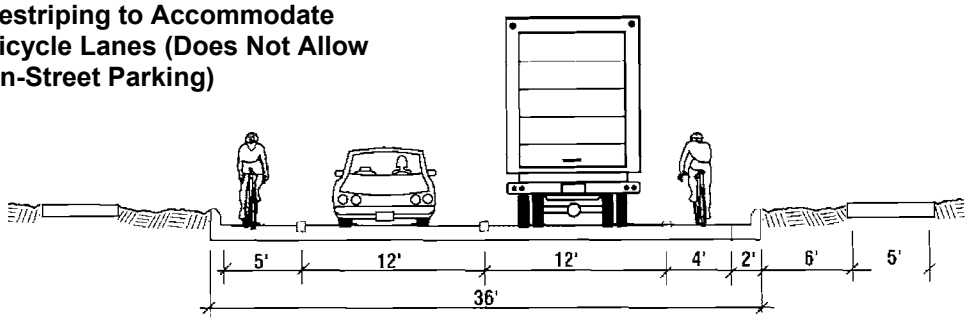
Typical Bicycle Cross Sections

B-3 BICYCLE LANES ON COLLECTOR STREETS

Existing Roadway



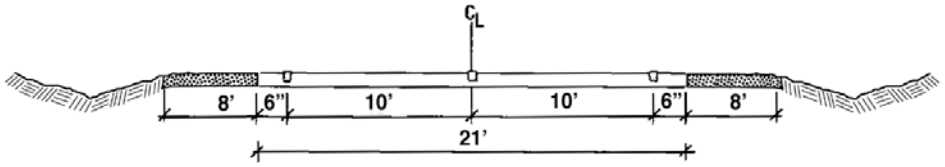
Restriping to Accommodate Bicycle Lanes (Does Not Allow On-Street Parking)



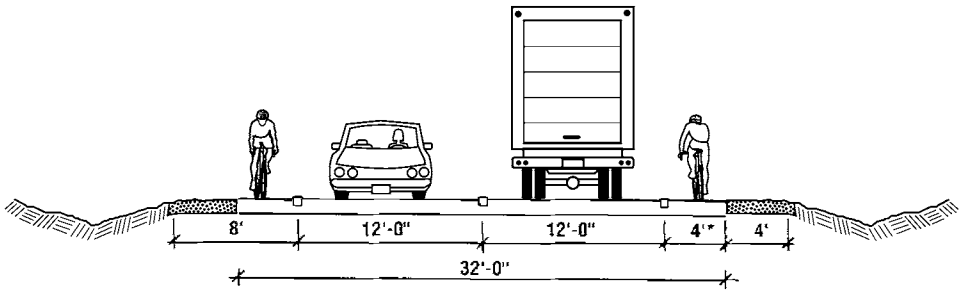
Typical Bicycle Cross Sections

B-4 WIDE PAVED SHOULDERS

Existing Roadway



Roadway Retrofitted with 4-Ft Paved Shoulders

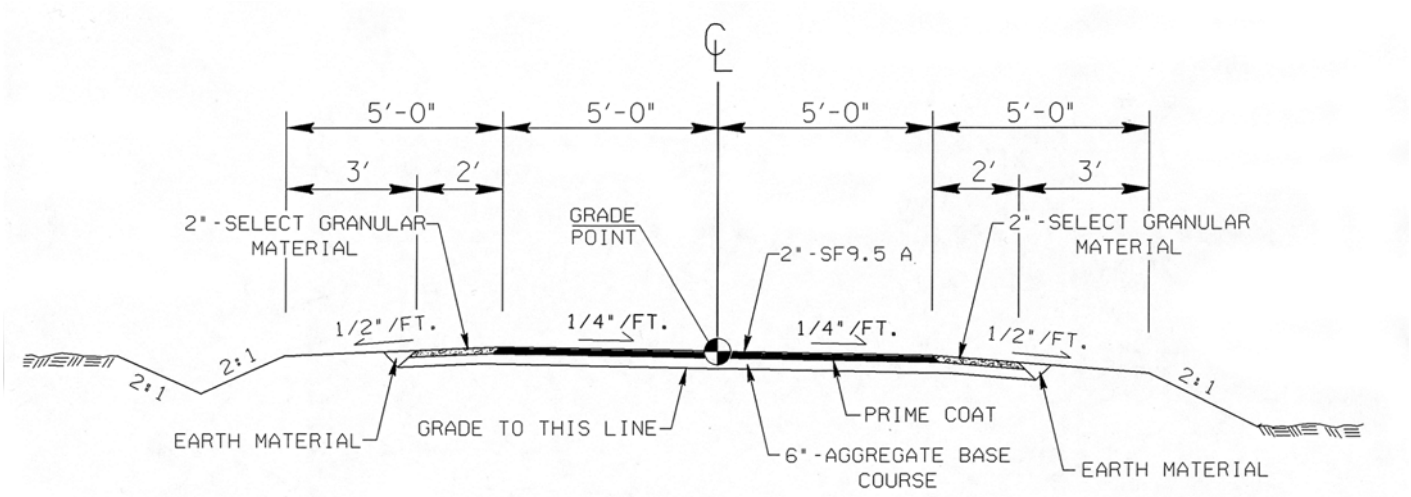


* If speeds are higher than 40 mph, shoulder widths greater than 4' are recommended.

Typical Bicycle Cross Sections

B-5 RECOMMENDED TYPICAL SECTION OF 10-FT ASPHALT PATHWAY

With 2-Ft Select Material Shoulder



Appendix E
Level of Service Definitions

The relationship of travel demand compared to the roadway capacity determines the level of service (LOS) of a roadway. Six levels of service identify the range of possible conditions. Designations range from LOS A, which represents the best operating conditions, to LOS F, which represents the worst operating conditions.

Design requirements for roadways vary according to the desired capacity and level of service. LOS D indicates "practical capacity" of a roadway, or the capacity at which the public begins to express dissatisfaction. Recommended improvements and overall design of the transportation plan were based upon achieving a minimum LOS D on existing facilities and a LOS C on new facilities. The six levels of service are described below and illustrated in Figure 11.

- **LOS A**: Describes primarily free flow conditions. The motorist experiences a high level 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 ft, 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 ft, 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 spacing is in the range of 220 ft, 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 the driver experiences drastically reduced comfort levels. Minor incidents can be expected to create substantial queuing. At the limit, vehicles are spaced at about 165 ft, 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 can establish a disruption wave that propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing. Vehicles are spaced at approximately 6 car lengths, leaving little room to maneuver.

- **LOS F**: Describes forced or breakdown flow. Such conditions generally exist within queues forming behind breakdown points.

Figure 10 - Level Of Service Illustrations

Level of Service A

Driver Comfort: High

Maximum Density:

12 passenger cars per mile per lane

Level of Service B

Driver Comfort: High

Maximum Density:

20 passenger cars per mile per lane

Level of Service C

Driver Comfort: Some Tension

Maximum Density:

30 passenger cars per mile per lane

Level of Service D

Driver Comfort: Poor

Maximum Density:

42 passenger cars per mile per lane

Level of Service E

Driver Comfort: Extremely Poor

Maximum Density:

67 passenger cars per mile per lane

Level of Service F

Driver Comfort: The lowest

Maximum Density:

More than 67 passenger cars per mile per lane

Source: 2000 Highway Capacity Manual

Appendix F
Traffic Crash Analysis

A crash analysis performed for the Town of Marshville CTP factored crash frequency, crash type, and crash severity. Crash frequency is the total number of reported collisions and contributes to the ranking of the most problematic intersections. Crash type provides a general description of the crash and allows the identification of any trends that may be correctable through roadway or intersection improvements. Crash severity is the crash rate based upon injuries and property damage incurred.

The severity of every crash is measured with a series of weighting factors developed by the NCDOT Division of Highways (DOH). These factors define a fatal or incapacitating crash as 47.7 times more severe than one involving only property damage and a crash resulting in minor injury is 11.8 times more severe than one with only property damage. In general, a higher severity index indicates more severe accidents. 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 4 depicts a summary of the crashes occurring in the planning area between January 1, 2002 and December 31, 2004. The data represents a location with 5 or more crashes or and/or a severity average greater than that of the state's 4.42 index. The "Total" column indicates the total number of accidents reported within 150-ft of the intersection during the study period. The severity listed is the average crash severity for that location.

Table 4 - Crash Locations

Map Index	Intersection	Average Severity	Total Collisions
1	US 74 and Elm Street (NC 205)	7.14	6
2	US 74 and White Street (SR 1005)	7.14	7
3	US 74 and Main Street (SR 1740)	7.14	9

The NCDOT is actively involved with investigating and improving many of these locations. To request a more detailed analysis for any of the locations listed in Table 5, or other intersections of concern, contact the Division Traffic Engineer. Contact information for the Division Traffic Engineer is included in Appendix A.

Appendix G
Bridge Deficiency Assessment

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

The NCDOT Bridge Maintenance Unit inspects all bridges in North Carolina at least once every two years. A sufficiency rating for each bridge is calculated and establishes the eligibility and priority for replacement. Bridges having the highest priority are replaced as Federal and State funds become available.

A bridge is considered deficient if it is either structurally deficient or functionally obsolete. Structurally deficient means there are elements of the bridge that need to be monitored and/or repaired. The fact that a bridge is "structurally deficient" does not imply that it is likely to collapse or that it is unsafe. It means the bridge must be monitored, inspected and repaired/replaced at an appropriate time to maintain its structural integrity. A functionally obsolete bridge is one that was built to standards that are not used today. These bridges are not automatically rated as structurally deficient, nor are they inherently unsafe. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearances to serve current traffic demand or to meet the current geometric standards, or those that may be occasionally flooded.

A bridge must be classified as deficient in order to quality for Federal replacement funds. Additionally, the sufficiency rating must be less than 50% to qualify for replacement or less than 80% to qualify for rehabilitation under federal funding. Deficient bridges within the planning area are listed in Table 5.

Table 5 - Deficient Bridges

Bridge Number	Facility	Feature	Condition	CTP Project
93	SR 1937	Branch of Beaverdam Creek	Functionally Obsolete	
101	SR 1005	Beaverdam Creek	Functionally Obsolete	UNIO0007-H
309	SR 1902	Branch of Beaverdam Creek	Functionally Obsolete	