NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH

BELHAVEN

THOROUGHFARE PLAN

1992

THOROUGHFARE PLAN
FOR THE
TOWN OF BELHAVEN

Prepared by the:
Thoroughfare Planning Unit B
Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

In Cooperation with:
The Town of Belhaven
The Federal Highway Administration
U.S. Department of Transportation

1992

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ACKNOWLEDGEMENTS

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125 copies of this document were printed at a cost of $282.76 or 2.26 per copy (G.S. 143-170.1).

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I. INTRODUCTION

The Town of Belhaven is located in Beaufort County approximately 30 miles east of Washington, the county seat, as shown in Map 1. It is bordered to the east by the Pantego Creek and the Pungo River and lies along the Intracoastal Waterway, which is a major north-south route for the shipping industry and recreational boaters. It is in the lower marina terrace of the coastal plain, the so-called "flatwoods" region. The Town is primarily a farming, fishing, and logging community. Major highway access to and from the area consists of US 264 East and West and NC 99 to the south.

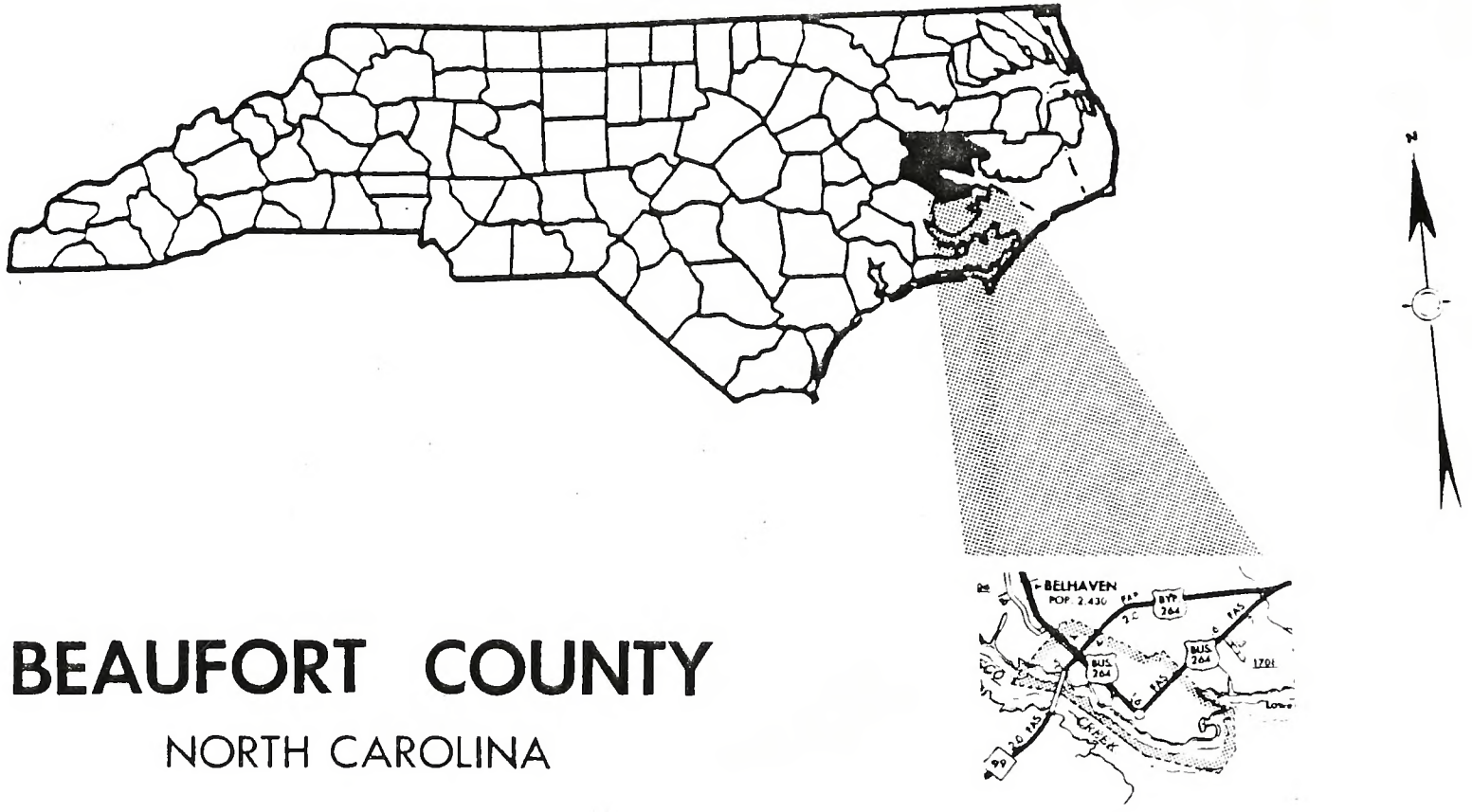
A Thoroughfare Plan for Belhaven was adopted by the Town Council on January 5th, 1981. The Plan was also adopted by the North Carolina Department of Transportation on March 13th, 1981.

In 1991 the Town of Belhaven requested assistance from the North Carolina Department of Transportation in updating their Thoroughfare Plan. The Town was in the initial stages of updating their Long-Range Land Use Plan so it was logical to update the Thoroughfare Plan at this time also.

The draft Thoroughfare Plan was presented and discussed at the November 20th, 1991 Planning Board Meeting. The updated Thoroughfare Plan was recommended for approval at the January 15th, 1992 Planning Board Meeting. On March 16th, 1992 the Belahven Town Board adopted the Thoroughfare Plan. The Belhaven Thoroughfare Plan was adopted by the North Carolina Board of Transportation on May 8th, 1992.

The purpose of this report is to document the study process, findings and recommendations. Included are recommendations for thoroughfare cross-sections, cost estimates for recommended improvements, benefits evaluations of recommended improvements, and plan implementation recommendations.

BELHAVEN GEOGRAPHICAL LOCATION MAP



BEAUFORT COUNTY

NORTH CAROLINA

FIGURE 1

BELHAVEN GEOGRAPHICAL LOCATION MAP

II. THOROUGHFARE PLANNING PRINCIPLES

Objectives

Typically, the urban street system occupies 25 to 30 percent of the total developed land in an urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process public officials use to assure the development of the most appropriate street system that will meet existing and future travel desires within the urban area.

The primary aim of a thoroughfare plan is to guide the development of the urban street system in a manner consistent with the changing traffic patterns. A thoroughfare plan will enable street improvements to be made as traffic demands increase, and it helps eliminate unnecessary improvements, so needless expense can be averted. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained, requiring a minimum amount of land for street purposes. In addition to providing for traffic needs the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial, and industrial development affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

1. providing for the orderly development of an adequate major street system as land development occurs,

2. reducing travel and transportation costs,

3. reducing the cost of major street improvements to the public through the coordination of the street system with private action,

4. enabling private interests to plan their actions, improvements, and development with full knowledge of public intent,

5. minimizing disruption and displacement of people and businesses through long range advance planning for major street improvements,

6. reducing environmental impacts, such as air pollution, resulting from transportation, and

7. increasing travel safety.

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

Operational Efficiency

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

Physical ways to improve vehicular capacity include street widening, intersection improvements, improving vertical and horizontal alignment, and eliminating roadside obstacles. For example, widening of a street from two to four lanes more than doubles the capacity of the street by providing additional maneuverability for traffic. This reduces the impedances to traffic flow caused by slow moving or turning vehicles and the adverse effects of horizontal and vertical alignments.

Operational ways to improve street capacity include:

1. Control of access -- A roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number.

2. Parking removal -- Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.

3. One-way operation -- The capacity of a street can sometimes be increased 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.

4. Reversible lanes -- Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.

5. 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 or altered in the following ways:

1. Encourage people to form carpools and vanpools for journeys to work and other trip purposes. This reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.

2. Encourage the use of transit and bicycle modes.

3. Encourage industries, businesses, and institutions to stagger work hours or establish variable work hours for employees. This will spread peak travel over a longer time period and thus reduce peak hour demand.

4. Plan and encourage land use development or redevelopment in a more travel efficient manner.

System Efficiency

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

Functional Classification

Streets perform two primary functions -- traffic service and land service, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property leads to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict. Streets are categorized as to function as local access streets, minor thoroughfares, or major thoroughfares (See Figure 2).

Local Access Streets provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins and destinations of the streets would be served. Local streets may be further classified as either residential, commercial, and/or industrial

depending upon the type of land use which they serve.

Minor Thoroughfares are more important streets on the city system. They collect traffic from local access streets and carry it to the major thoroughfares. They may in some instances supplement the major thoroughfare system by facilitating minor through traffic movements. A third function that may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

Major Thoroughfares are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. The streets which comprise the major thoroughfare system may also serve abutting property, however, their principle function is to carry traffic. They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity of the thoroughfare to carry traffic and each driveway is a danger and an impediment to traffic flow. Major thoroughfares may range from a two-lane street carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted on major thoroughfares.

Idealized Major Thoroughfare System

A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is most adaptable to desire lines of travel within an urban area is the radial-loop system. It permits movement between various areas of the city within maximum directness. This system consists of several functional elements--radial streets, crosstown streets, loop system streets, and bypasses (Figure 1).

Radial streets provide for traffic movement between points located on the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of crosstown streets which form a loop around the central business district. This system allows traffic moving from origins on one side of the central area to destinations on the other side to follow the area's border. It also allows central area traffic to circle and then enter the area near a given destination. The effect of a good crosstown system is to free the central area of crosstown traffic, thus permitting the central area to function more adequately in its role as a business or pedestrian shopping area.

Loop system streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a

IDEALIZED THOROUGHFARE PLAN

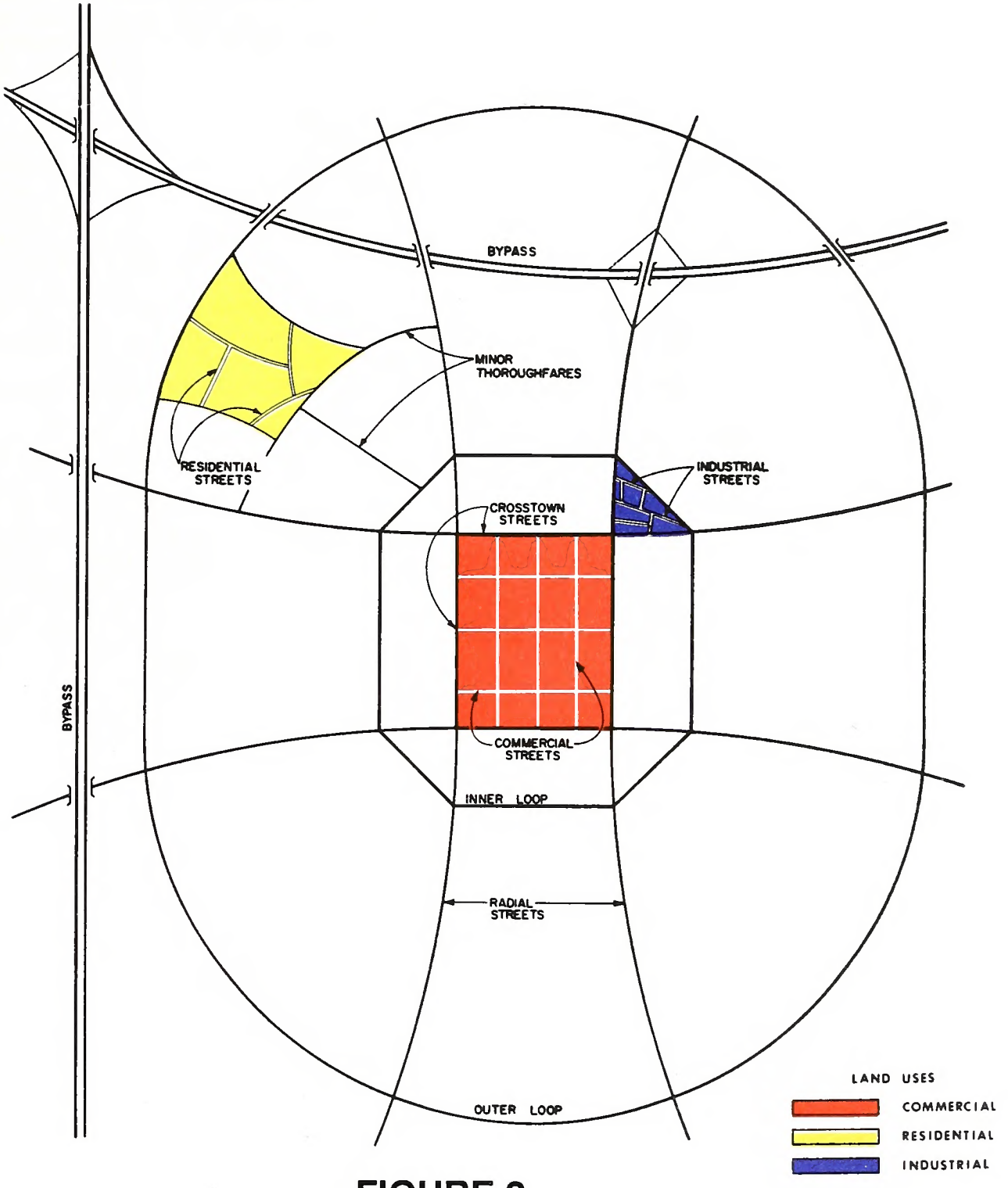


FIGURE 2

typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area. They are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A bypass is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing traffic which has no desire to be in the city. Bypasses are usually designed to through-highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of operational efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, a thoroughfare plan is developed for established urban areas and is constrained by the 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 constraints and the many other factors that affect major street locations.

III. EXISTING AND PROJECTED CONDITIONS

Land Use - Existing Conditions

The Town of Belhaven is largely residential in nature, as shown on the existing land use map in Figure 3. Most of the residential development is concentrated in the eastern section of Town near Tooley's Creek, west of NC 99 north of the bridge, and between Lee and Pamlico Streets.

Commercial development is concentrated along a two block section of Pamlico Street between Water and Pungo Streets and along Main Street from Pamlico to Allen Street. Highway retail is located mainly along both sides of US 264 Bypass from the northern corporate limits south to Pantego Street. Another smaller section is located near the intersection of Main Street and the US 264 Bypass.

Industrial development is located west of the corporate limits on both sides of US 264. The area south of Main Street between King Street and NC Highway 99 is shown on the land development plan as light industry because of the transportation access provided by Pantego Creek, the railroad span, and US Highway 264. Most operations are seafood processors with the exception of Cargill, a grain dealer.

Community facilities include two public schools within the Belhaven planning area. They are the Belhaven Elementary School on Pantego Street and the J. A. Wilkinson Junior High School on Main Street. The Pungo Christian Academy, a private school for grades Pre-Kindergarten through 12, is also located on Main Street. Other community facilities include the Town Hall, Welcome Center, fire station, library, parks, and a marina.

Land Use - Future

Figure 4 shows the Land Classification Map for Belhaven to guide future planning decisions. Most of the land located within the Town Limits is classified as developed. This includes areas already developed at high to moderate densities where public services are available. The undeveloped waterfront industrial section and several pockets of undeveloped areas in the center of Town are the only exceptions.

The transition areas will become part of the urban area when additional development occurs as water and sewer services are provided. This includes land in the northern section of Town as well as some land on the peninsula between Battalina and Tooley's Creeks and along the southern portion of Highway 264 leading into Town.

The Rural classification denotes undeveloped areas which may be used for low intensity non-urban uses such as agricultural production, mineral extraction, or forestry activities. Nearly all of the land outside the Town Limits falls into this classification.

The estuarine waters, the estuarine shorelines, public trust waters, and coastal wetlands are denoted in the Conservation classification. Only water-oriented uses, necessary utility service lines, bulkheading, and navigational aids are permitted in these locations.

Population Trends

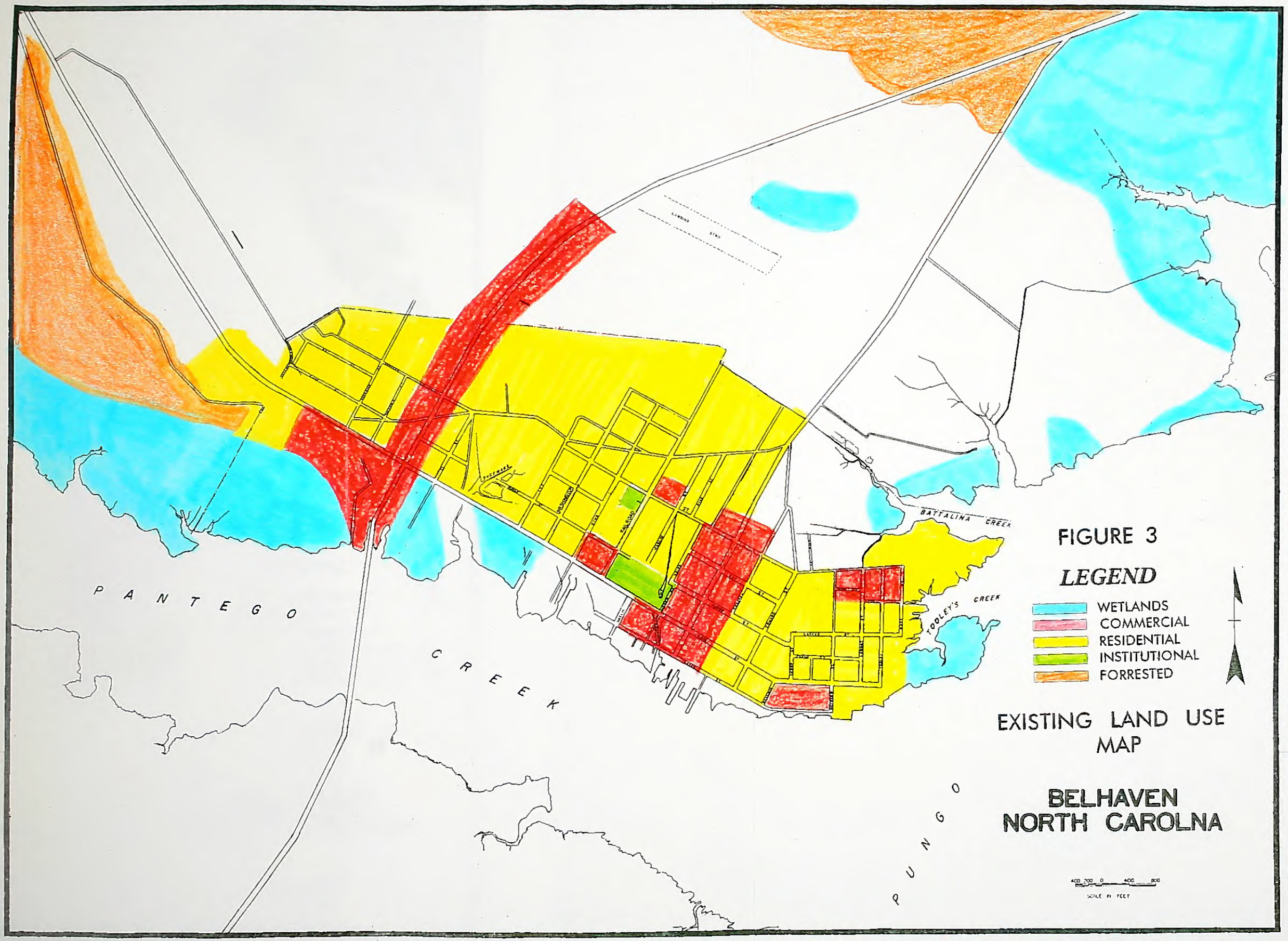
Travel is directly related to population and the volume of traffic on any section of roadway is closely related to the size and distribution of the population which it serves. One of the basic steps in planning a transportation system is a population study to forecast a reasonable and logical future population and its distribution. A close look at the past will give some indication as to what might be expected in the future.

Population within the Town of Belhaven increased 7.6% between 1970 and 1980 from 2,259 persons to 2,430 persons. However, the 1990 census count of 2269 persons represents a 7.1% decrease in population from 1980. The Pantego Township increased 11.6% from 6,204 persons in 1980 to 6,925 persons in 1990. In addition, the Beaufort County population increased 4.8% during this same time period. Population projections for Beaufort County prepared by the NC Office of State Budget and Management are shown in Table 1 below:

Table 1 - Beaufort County Population Trends and Projections

Census Year	Population	% Increase
1970	35,980	
1980	40,355	12.2%
1990	42,283	4.8%
2000	44,147	4.4%
2010	45,239	2.5%

Population projections for the Town of Belhaven can be calculated by using the percent growth rates based on the State Budget and Management estimates for Beaufort County. This will result in projecting a 2005 population for Belhaven of 2,369 persons and a 2010 population of 2,428 persons. While the Town of Belhaven Land Use Plan Update projected a 1995 population of 2,675 persons, this estimate was based upon a 1990 population estimate of 2,591. When the 1990 Census data became available, the official population count in Belhaven was 2,269. Thus, projections were altered based upon the 1990 Census data.


PANTEGO
CREEK
PUNGO
BATTALINA CREEK
TOOLEY'S CREEK
FIGURE 3
LEGEND
WETLANDS
COMMERCIAL
RESIDENTIAL
INSTITUTIONAL
FORRESTED
EXISTING LAND USE MAP
BELHAVEN
NORTH CAROLNA
400 200 0 400 800
SCALE IN FEET

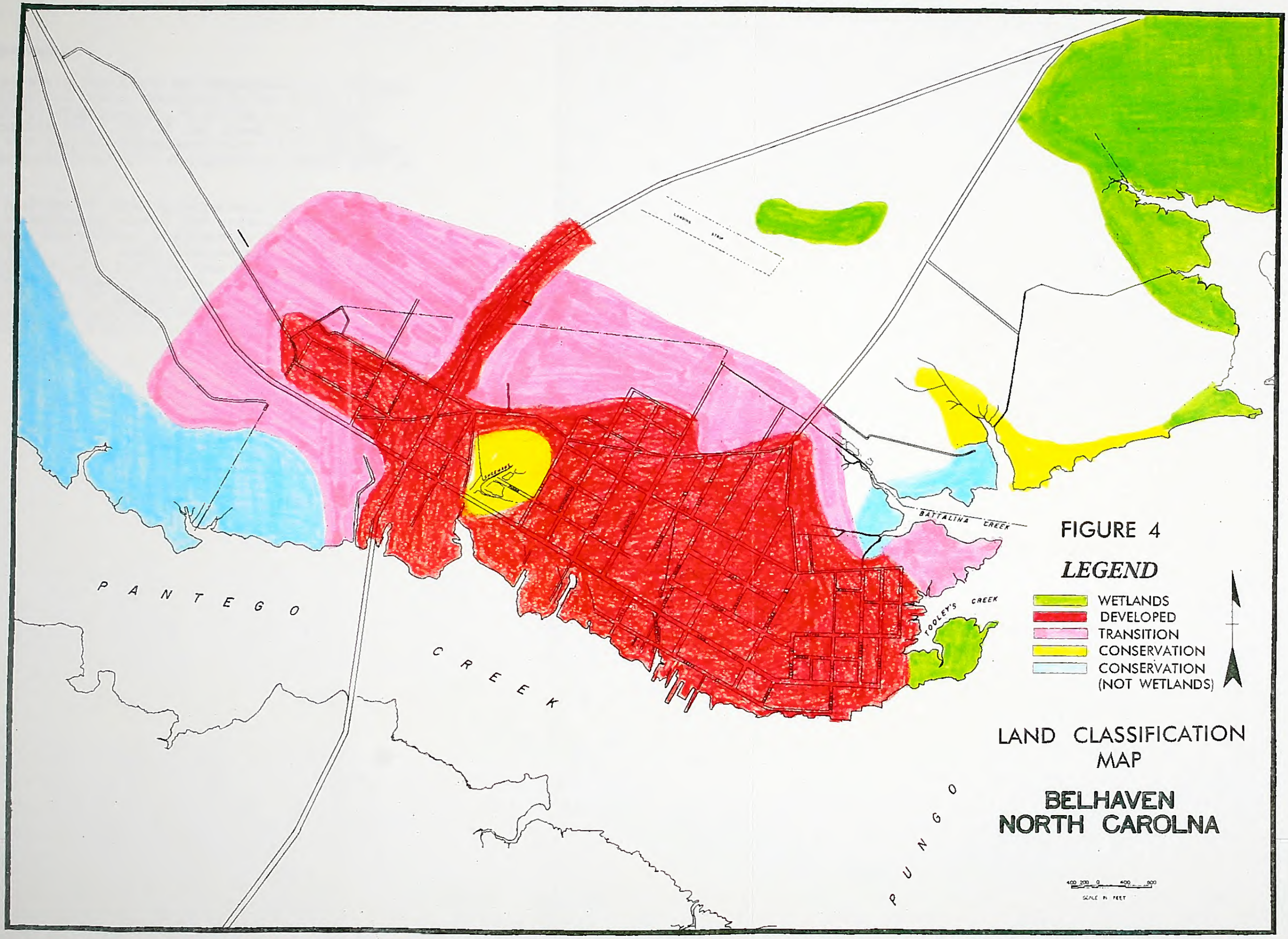


FIGURE 4

LEGEND

LAND CLASSIFICATION MAP

BELHAVEN NORTH CAROLNA

Economy and Employment

Table 2 provides a breakdown of employment by industry. As can be seen from the table, Belhaven is dominated by manufacturing, which comprises 26.7% of the work force. Retail trade accounts for 20.9% of the local work force. Health services are next in importance with 7% of the labor force and agriculture/forestry/fishing/mining employ 6.6% of the work force.

Belhaven's economy is heavily dependent on the quality of water in the surrounding rivers and creeks. This is because the fishing and seafood business is the major industry in the area. Four large seafood processing plants are located in the Town and purchase the majority of their products directly from local fishermen. Belhaven's catch is estimated to account for 90 percent of the commercial catch for Beaufort County. Recreational fishing and boating are also very popular local industries.

TABLE 2

EMPLOYMENT BY PERSONS 16 YEARS AND OVER BY INDUSTRY, 1984

INDUSTRY	TOTAL PERSONS	PERCENT
Agriculture, Forestry, Fishing and Mining	59	6.6
Construction	41	4.6
Manufacturing	244	26.7
Transportation	25	2.8
Communication/Public Utilities	28	3.1
Wholesale Trade	54	6.0
Retail Trade	186	20.9
Finance, Insurance, and Real Estate	54	3.2
Business and Repair Services	14	1.5
Personal, Entertainment, and Recreation Services	40	4.5
Health Services	63	7.0
Education Services	55	6.1
Other Professional and Related Services	23	2.6
Public Administration	28	3.1
TOTAL	914	
UNEMPLOYED	107	11.7

Source: 1986 Belhaven Land Use Plan Update, Mid-East Commission, page 7.

Transportation - Existing

The NCDOT conducts a traffic counting program across the State. Figure 5 shows the 1990 Average Daily Traffic (ADT) volumes on State Roads and some local roads in the Belhaven planning area. These counts were then compared to the capacity of the roads. Capacity is defined as the maximum amount of traffic that can be accommodated by a given facility. To obtain a rating of good to poor, six levels of service are used. They are given letter designations from A to F with level-of-service A representing the best operating conditions and LOS F the worst. Appendix A provides a description of each level of service.

The major highway system in Belhaven is US 264 and NC 99. The highest traffic volume, 6300 vehicles per day, is on Main Street (US 264 Business) which is the most direct access to the downtown area. US 264 Alternate carries traffic volumes ranging from 4,700 to 5,500 vehicles per day and NC 99 has 4,100 vehicles per day. The Minor Thoroughfares have considerably less traffic than the roads mentioned above. Currently, none of the roads in Belhaven are operating over capacity and traffic congestion is not a significant problem.

Transportation - Future

The Thoroughfare Plan is designed to serve travel between the year 2010 and the year 2015. Therefore, traffic projections were developed on the basis of historical traffic growth trends and anticipated future land use patterns. These projections are shown on Figures 6 and 7.

Due to the low rate of growth, traffic volumes are not expected to increase significantly over the next 20 years. None of the roads in Belhaven will be operating over capacity. However, US 264 Business and Alternate will be approaching capacity limits. NC 99 will also be approaching capacity limits due to the traffic increases created by the proposed US 264 corridor between SR 1714 (Seed Tick Neck Road) and NC 99. If this project is constructed, traffic on existing US 264 west of Belhaven will be routed onto NC 99 across the Pantego Creek.

Traffic Accidents

Traffic Accident analysis is a serious and important consideration in the development of a thoroughfare plan. The source of traffic accidents can be broken down into three general categories. The first is the physical environment which includes such things as road condition, weather, road obstructions, and traffic conditions. The second source is associated with the driver. This includes the driver's mental alertness, distractions in the car, ability to handle the vehicle, and reaction time. The third source is

associated with the physical attributes of the vehicle itself. This would include such things as the condition of the brakes and tires, vehicle responsiveness, size of the vehicle, and how well the windshield wipers and defroster work. All traffic accidents can be attributed to one or more of these sources; however, the driver is often the primary source.

Accident data for May 1988 through May 1991 was studied as part of the development of this report. The largest accident count for a single intersection in Belhaven was found at the US 264 Bypass and Old County Road. Two other intersections on US 264 experienced five or more accidents during this period, as shown in Table 3.

A general review of the accident types at high accident intersections revealed the greatest percentages were related to rear-end collisions and angle collisions which are indicative of a control violation or sight distance problem. All of these intersections also have high traffic volumes on all approaches which increases the probability of conflicts.

TABLE 3 - SELECTED ACCIDENT INVENTORY
(May 1988 - May 1991)

Location	Number of Accidents
US 264 Bypass at Old County Road	10
US 264 Bypass at Pantego Street	7
Main Street at Allen Street	5

One intersection not listed as a high accident location, but which has geometric problems is the intersection of Lee Street and Old County Road. This is an off-set intersection located north of Main Street without proper signing. The proposed connection of Old County Road with Pantego Street would eliminate this intersesction problem by closing a section of Old County Road.

LEGEND

	EXISTING	PROPOSED
MAJOR THOROUGHFARE	▬	
MINOR THOROUGHFARE	▬	▬ ▬ ▬

1990 AVERAGE DAILY TRAFFIC COUNT

US-264 BYPASS

US-264

US-264 ALT.

1,200

5,500

425

258

793

330

793

4,700

343

428

431

6,300

4,100

2,779

1,900

133

163

819

2,549

555

1,138

HARBINGER ST.

CALIFORNIA ST.

OLD COUNTY RD.

GEORGE ST.

WASHINGTON ST.

PANTEGO ST.

RAILROAD ST.

MAIN ST.

PAMLICO ST.

HASLIN ST.

EDWARD ST.

TOOLEY ST.

WATER ST.

RIVERVIEW ST.

BATTALINA CREEK

TOOLEY CREEK

PANTEGO CREEK

PUNGO RIVER

NC 99

ADOPTED by TOWN OF BELHAVEN ON
March 16, 1992

RECOMMENDED APPROVAL BY
Statewide Planning Branch
April 15, 1992 M.R. Poole

ADOPTED by NORTH CAROLINA BOARD OF TRANSPORTATION ON
May 8, 1992

FIGURE 5

THOROUGHFARE PLAN

March 16, 1992

BELHAVEN
NORTH CAROLINA

LEGEND

	EXISTING	PROPOSED
MAJOR THOROUGHFARE	▬	
MINOR THOROUGHFARE	▬	▬ ▬ ▬

2010 AVERAGE DAILY TRAFFIC COUNTS

US-264 BYPASS

US-264

US-264 ALT.

3,500

11,500

600

500

1,500

600

1,500

7,300

10000

550

800

9,000

4,700

700

3,500

350

400

5,000

3,500

1,200

850

OLD COUNTY RD.

HARRINGER ST.

CALIFORNIA ST.

GEORGE ST.

PANTEGO ST.

WASHINGTON ST.

RAILROAD ST.

MAIN ST.

PAMLICO ST.

EDWARD ST.

TOOLEY ST.

WATER ST.

RIVERVIEW ST.

BATTALINA CREEK

TOOLEY'S CREEK

PANTEGO CREEK

PUNGO RIVER

NC 99

SUBMITTED BY TOWN OF BELHAVEN ON
March 16, 1992

RECOMMENDED APPROVAL BY
Statewide Systems Section
April 15, 1992 M.R. Sled

ADOPTED BY NORTH CAROLINA BOARD OF TRANSPORTATION ON
May 6, 1992

FIGURE 6

THOROUGHFARE PLAN

March 16, 1992

BELHAVEN
NORTH CAROLINA

LEGEND

	EXISTING	PROPOSED
MAJOR THOROUGHFARE	■	
MINOR THOROUGHFARE	■	■ ■ ■ ■

2015 AVERAGE DAILY TRAFFIC COUNTS

US-264 BYPASS

US-264

US-264 ALT.

4,000

14,000

700

600

2,000

750

2,000

8,000

11,000

700

6,000

950

13,000

900

4,000

600

500

1,400

6,000

1,000

4,200

MARBINGER ST.

CALIFORNIA ST.

OLD COUNTY RD.

GEORGE ST.

PANTEGO ST.

WASHINGTON ST.

RAILROAD ST.

MAIN ST.

PAMLICO ST.

EDWARD ST.

HASLIN ST.

WATER ST.

TOOLEY ST.

RIVERVIEW ST.

BATTALINA CREEK

LEY'S CREEK

PANTEGO CREEK

PUNGO RIVER

NC 99

ADOPTED BY TOWN OF BELHAVEN ON
March 16, 1992

RECOMMENDED APPROVAL BY
Statewide Planning Branch
April 15, 1992 M.R. Lee

ADOPTED BY NORTH CAROLINA BOARD OF TRANSPORTATION ON
May 8, 1992

FIGURE 7

THOROUGHFARE PLAN

March 16, 1992

BELHAVEN
NORTH CAROLINA

IV. PUBLIC INVOLVEMENT

In May, 1991, the Department of Transportation received a request from the Town of Belhaven asking for assistance in reviewing and updating their 1981 Thoroughfare Plan. On June 19th, 1991, engineers met with the Town Manager and Planning and Zoning Administrator to discuss the goals and expectations of the study. Initial concern was expressed regarding the proposed widening of US 264 between Washington and Belhaven. Local traffic utililzes SR 1714 (Seed Tick Neck Road) to access US 264. This routing is over three miles shorter than traveling US 264 through Pantego. Since this route is the most direct connection, The Town officials wanted an analysis of improving this route as opposed to widening US 264.

Another meeting was held in Belhaven on July 30th, 1991 to discuss some of the preliminary findings of the thoroughfare study. Informational materials pertaining to Belhaven were acquired at the Chamber of Commerce.

On October 10th, 1991, a proposed Thoroughfare Plan Map and list of recommended improvements was mailed to the Town Manager of Belhaven. The proposed Thoroughfare Plan was subsequently presented to the Belhaven Planning Board on November 20th, 1991. Concern was expressed over the proposed George Street extension to the US 264 Bypass. The Planning Board members felt this connection between residential areas in the north part of Town and the US 264 Bypass would divert traffic from the downtown area. This recommended improvement was subsequently removed from the Thoroughfare Plan. In addition, a recommendation to designate Harbinger Street between Pantego Street and the proposed George Street extension as a Minor Thoroughfare and pave that portion of the road was removed from the proposed Thoroughfare Plan.

The proposed Thoroughfare Plan reflecting the comments at the November 20th meeting was presented to the Belhaven Planning Board again at the January 15th, 1992 Meeting. The plan was recommended for approval to the Town Council. A combined public hearing and Town Council meeting were held on March 16th, 1992. Questions centered on the US 264 widening TIP project and the proposed US 264 Bypass shown on the Thoroughfare Plan which followed a routing along SR 1714 (Seed Tick Neck Road). The Town Council reiterated their support for an alignment south of US 264 as opposed to widening the existing US 264. They feel it will serve travel demand more efficiently and maintain their economic viability.

At the March 16th Town Council meeting, the Thoroughfare Plan was adopted as presented. The Thoroughfare Plan was subsequently approved by the North Carolina Board of

Transportation on May 8th, 1992.

V. THOROUGHFARE PLAN

The first thoroughfare plan for Belhaven, dated March 13th, 1981, is shown in Figure 8. This plan formed the basis for development of the June 7th, 1992 Thoroughfare Plan. The following chapter details the 1992 Belhaven Thoroughfare Plan, shown in Figure 9. It includes a list of roads that are recommended to serve as major and minor thoroughfares. A brief discussion of each road's function is included to support it's classification as a thoroughfare.

Major Thoroughfare System

The Belhaven major thoroughfare system includes US 264, US 264 Alternate, US 264 Bypass, and NC 99. These roads are shown on Figure 9. The function of each of these roads and recommended improvements will be discussed in this section. Typical thoroughfare cross-sections are shown in Appendix B and Appendix C summarizes the thoroughfare plan street tabulation and recommendations.

US 264 (Western Planning Area Boundary to NC 99) - This facility is the major east-west highway into and through Belhaven. The existing cross-section is 2 lanes with 24' of pavement and grass shoulders. Traffic projections indicate that the existing cross-section should be adequate to handle future traffic volumes.

US 264 Business (Main Street from NC 99 to Pamlico Street) - This facility provides access from both NC 99 and US 264 to the central business district. Since much of the outlying area is rural, this route is important for access to shopping and business for both Belhaven residents and outlying communities. While traffic volumes will be approaching capacity in the future, this two-lane facility should be able to handle the traffic since most segments have lane widths exceeding 12' and turning lanes at intersections. Capacity problems in the downtown area could be alleviated by eliminating some of the on-street parking.

US 264 Alternate (Pamlico Street) - This major thoroughfare serves as a radial route connecting the downtown area with the US 264 Bypass. It is the Old US 264 Highway through the downtown area. Traffic projections indicate that the exisiting two-lane cross-section should be adequate to handle future traffic volumes.

US 264 Bypass - The Bypass carries nonlocal traffic through the urban area and provides relief to the city street system. The existing two lanes will be adequate through the 20 year planning period. Construction of the proposed segment from SR 1714 (Seed Tick Neck Road) to NC 99 in the southern

portion of the planning area will enhance the access to Washington for Belhaven residents. It will also reduce traffic volumes on US 264 between the US 264 Bypass and the western planning area boundary. An aerial overview of this proposed facility is shown in Figure 10.

NC 99 - This major thoroughfare is the only north-south radial from Belhaven to Pamlico Sound and then loops easterly toward Washington. It will increase in importance when the proposed US 264 Bypass from SR 1714 (Seed Tick Neck Road) to NC 99 is constructed. The Bypass will intersect NC 99 south of Pantego Creek at which point NC 99 will run concurrently with the Bypass northward. Future traffic volumes do not warrant any recommended improvements.

Minor Thoroughfare System

Minor thoroughfares in the Belhaven Thoroughfare Plan are shown in Figure 8 and include Edward Street, George Street, Harbinger Street, Haslin Street, Main Street, Old County Road, Pamlico Street, Pantego Street, Railroad Street, Riverview Street, Tooley Street, Washington Street, and Water Street.

Edward Street - This north-south facility connects the minor thoroughfares of Pantego Street, Main Street, and Water Street. Thus, it provides access for the residential areas in the eastern section of Belhaven to US 264, the downtown area, and the waterfront area. This two lane facility is not expected to experience any traffic congestion in the future.

George Street - This two-lane facility carries mostly residential traffic north of the central business district. It provides a north-south connection between the minor thoroughfares of Washington Street and Railroad Street, which both lead to Main Street. It carries mostly residential traffic and is not expected to experience any substantial increase in traffic over the next twenty years.

Harbinger Street - This minor thoroughfare connects residential areas in the west with US 264. While future traffic volumes will not exceed the capacity of this two lane road, the existing 16 feet of pavement should be widened to 22 feet. This will provide two 11 foot lanes and increase the safety of the road.

Haslin Street - This short road segment connects The downtown area with the waterfront area via Water Street. It carries a mixture of residential and tourist traffic. The existing two lane cross-section should be adequate to handle anticipated future traffic volumes.

Main Street - The section of Main Street between Pamlico Street and Tooley Street is designated as a minor thoroughfare. It provides an east-west connection for the residential areas in the eastern area of Belhaven with the downtown area. It is also parallel to Water Street and, thus, provides access to the waterfront area and park. The existing two lane cross-section should be adequate to handle anticipated future traffic volumes.

Old County Road - This minor thoroughfare provides an east-west connection between the minor thoroughfare of Pantego Street and US 264 Alternate. It serves mostly residential areas in the center of Belhaven near the Belhaven Elementary School. It also functions as a crosstown connector when combined with the proposed connection with Pantego Street. The existing 18 feet of pavement should be widened to 22 feet to adequately handle the traffic volumes.

Pamlico Street - This short north-south road segment connects the major thoroughfare of Main Street (US 264 Business) and US 264 Alternate with the waterfront area via Water Street. It carries a mixture of residential and tourist traffic. The existing two lane cross-section should be adequate to handle anticipated future traffic volumes.

Pantego Street - This minor thoroughfare also provides an east-west connection between the major thoroughfares of the US 264 Bypass and Pamlico Street (US 264 Alternate). It will increase in importance when combined with the proposed connection with Old County Road. This improvement will create a continuous crosstown facility across most of the planning area. in the east, it provides access to the boat building and repair facility.

The existing two lane cross-section should be adequate to handle anticipated future traffic. However, the segment of Pantego Street between Harbinger Street and Old County Road will need to be widened from 18 feet of pavement to 22 feet of pavement to safely accommodate future traffic volumes.

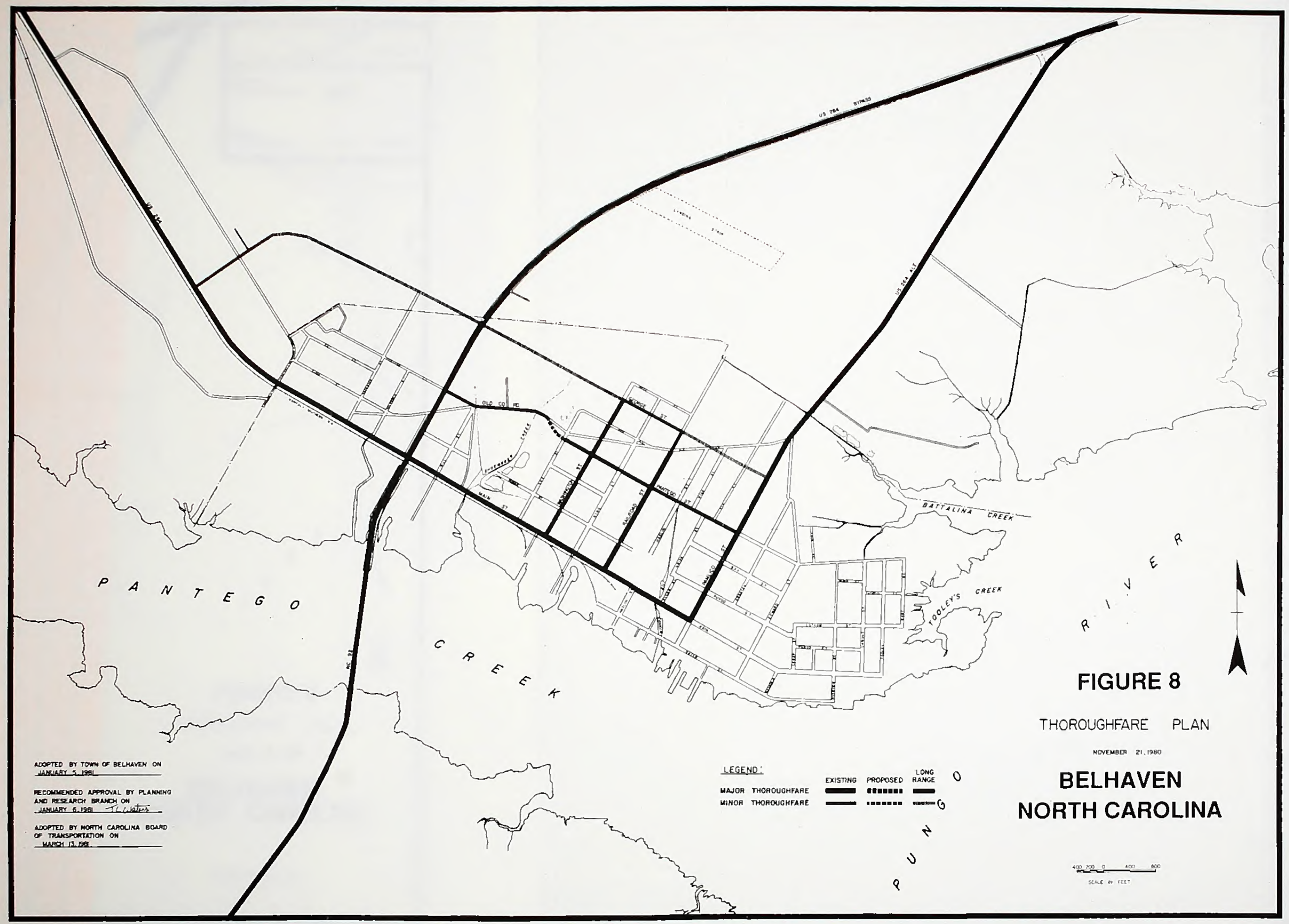
Railroad Street - Railroad Street is another collector cross-town facility which serves residential neighborhoods and the school district. Parallel to Washington Street, it also intersects Main Street. The existing two-lane cross-section should be adequate to handle anticipated future traffic volumes.

Riverview Street - This short section of road connects Main Street and Water Street. Thus, it provides access to both the central business district and the waterfront area. The two lane cross-section should be adequate to handle anticipated future traffic volumes.

Tooley Street - This residential street connects Pantego Steet and Main Street. It serves mostly residential traffic and is not expected to experience any substantial increase in traffic over the next 20 years.

Washington Street - This street is a collector cross-town facility which serves residential neighborhoods in the northern part of town. It intersects Main Street, a major thoroughfare which leads to the downtown area. The existing two-lane cross-section should be adequate to handle anticipated future traffic volumes.

Water Street - This east-west minor thoroughfare serves an important function by providing access to the waterfront area for recreational purposes. Houses as well as a park and Bed and Breakfast Inn are located along Water Street. This creates a mixture of residential, recreational, and tourist traffic. The existing two lane cross-section should be adequate over the 20 year planning period.



ADOPTED BY TOWN OF BELHAVEN ON
JANUARY 5, 1981

RECOMMENDED APPROVAL BY PLANNING AND RESEARCH BRANCH ON
JANUARY 6, 1981

ADOPTED BY NORTH CAROLINA BOARD OF TRANSPORTATION ON
MARCH 13, 1981

FIGURE 8

THOROUGHFARE PLAN

NOVEMBER 21, 1980

BELHAVEN
NORTH CAROLINA

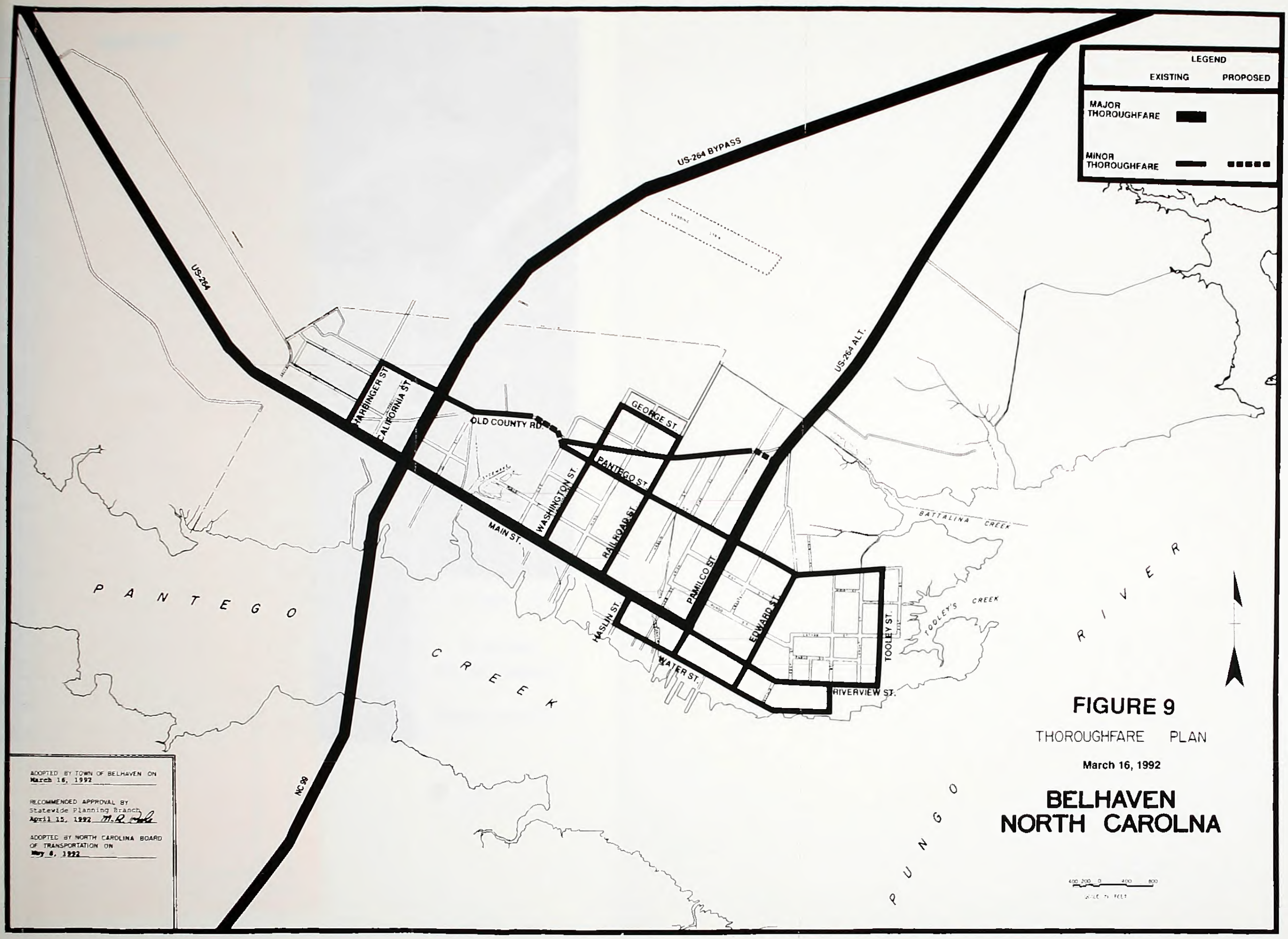


FIGURE 9

THOROUGHFARE PLAN

March 16, 1992

BELHAVEN NORTH CAROLNA

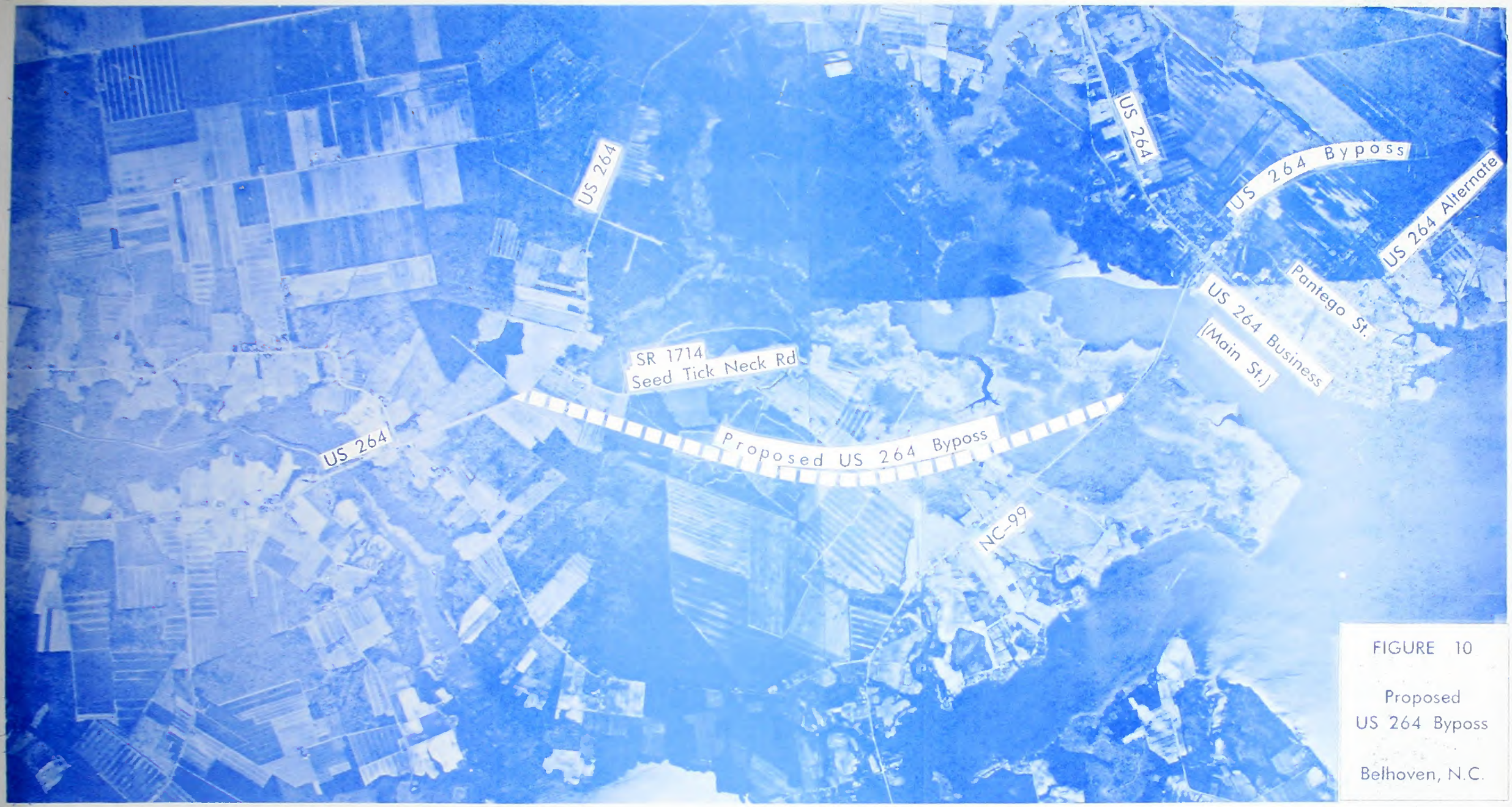


FIGURE 10

Proposed
US 264 Byposs

Belhoven, N.C.

VI. CONSTRUCTION PRIORITIES

An evaluation of the North Carolina highway program from administrative, historical, and financial perspectives indicates the following objectives are of greatest importance:

-To improve the North Carolina arterial system to reduce travel costs and improve travel service between urban centers.

-To improve the level of service and safety of all roads and highways on the State system in a cost effective manner.

-To encourage economic development.

-To preserve the natural and human environment.

-To allocate funds to projects in a fair and equitable manner.

(1) User benefits, (2) cost, (3) probability that a project will stimulate economic development, (4) quantification of environmental impacts, and (5) relationship of a project to the State Intrastate System provide a basis for evaluating how well projects meet these objectives.

Project user benefits include cost savings resulting from reductions in vehicle operating costs, travel time costs, and accident costs. Estimation of project evironmental impacts is one of the more difficult evaluations. Evironmental factors usually considered can be divided into three major categories--physical, social and/or cultural, and economic environmental considerations (see Table 4). Many of these are accounted for when a project is evaluated with respect to user benefits, cost, and economic development potential.

However, thirteen environmental factors are generally not considered in these evaluations. They are the environmental impacts of a project on (1) air quality, (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) park and recreational facilities, (11) historic sites and landmarks, (12) public health and safety, and (13) aesthetics, The summation of both positive and negative impact probabilities with respect to these factors provides a measure of the relative environmental impact of a project.

TABLE 4: ENVIRONMENTAL CONSIDERATIONS

Physical Soils and Geology	Social/Cultural Environment	Economic Environment
Air Quality	Housing	Businesses
Water Resources	Neighborhoods	Employment
Soils and Geology	Noise	Economic Development
Wildlife	Education Facilites	Public Utilities
Vegetation	Churches	Transportation Costs
	Parks and Recreational Facilities	Capital Costs
	Public Health and Safety	Operation and Maintenance Costs
	National Defense	
	Aesthetics	

Thoroughfare improvement needs identified and evaluated in the Belhaven Thoroughfare Plan are:

1. Construct a US 264 Bypass between SR 1714 (Seed Tick Neck Road) and NC 99 and multi-lane NC 99 and US 264 to Pamlico Street (US 264 Alternate)

2. Widen Harbinger Street to two 12 foot lanes from US 264 to Pantego Street.

3. Realign the intersection of Old County Road with Pamlico Street.

4. Construct a connector road between Old County Road and Pantego Street.

5. Widen Old County Road to two 12 foot lanes from the US 264 Bypass to Lee Street.

6. Widen Pantego Street to 24 feet of pavement from Harbinger Street to the US 264 Bypass.

The evaluation of the six Belhaven projects with respect to user benefits, estimated cost, probability that economic development will be stimulated, and environmental impact is detailed in Table 5 on page 46. All estimated user benefits and costs are in 1991 dollars. Considering the benefits evaluation of projects and transportation problems identified in this study, the recommended construction priorities are listed below and located in Figure 11. Photos of the recommended project locations are shown in Figure 12.

1. **US 264 Bypass from SR 1714 to NC 99 and Multi-laning NC 99 and US 264 to Pamlico Street (US 264 Alternate)** - US 264 is the main highway in Belhaven. Between Washington and Belhaven, the road curves in an inverted U-shape through Pantego. The residents of Belhaven avoid this circuitous route by traveling on NC 99 to the south to SR 1714 (Seed Tick Neck Road), which intersects US 264. This routing is over three miles shorter than traveling US 264 and avoids the Town of Pantego. Constructing a new route between SR 1714 and NC 99 is a more logical alternative than widening the existing US 264. Since it would be a multi-lane facility, the remainder of existing roadway, which is currently two lanes, will need to be multi-laned for a consistent cross-section and to increase capacity to accommodate future projected traffic volumes. An aerial overview of this entire Bypass is shown in Figure 10 on page 39.

   The area traversed by the new construction is predominately undeveloped farmland. A review of wetland maps indicates there will probably be no major wetland intrusions. While a twin bridge will need to be

constructed parallel to the existing bridge over the Pungo River, the cost should be approximately equal to or less than the right-of-way cost through Pantego.

It is estimated that approximately 65% of the traffic currently traveling US 264 through Pantego will be diverted onto the Bypass facility. This will result in a 2010 traffic volume ranging from 8,000 to 11,500 vehicles per day (vpd) and a 2015 traffic volume ranging from 10,000 to 14,000 vpd on the Bypass. These volumes warrant the construction of the US 264 Bypass as a multi-lane facility requiring 100 feet of right-of-way. Access from abutting property to the Bypass should be minimized to ensure a high level-of-service.

Estimated Cost - $18,000,000

2. **Widen Harbinger Street to two twelve foot lanes between US 264 and Pantego Street** - This road is currently very narrow with no shoulders and poor drainage. Widening this road will improve access and safety for residential traffic in the western part of Town from US 264. Harbinger Street also connects US 264 to Pantego Street, which is a major east-west facility across Town.

Estimated Cost - $84,000

3. **Old County Road/Pamlico Street Intersection Improvement** - This project will eliminate the skewed intersection at Old County Road and Pamlico Street. Currently, the west side of Old County Road intersects Pamlico Street at a 45 degree angle. Design standards recommend an approach angle between 75 degrees and 90 degrees. Moving the west side of Old County Road south approximately 80 feet will eliminate the skew of the angle at this intersection.

Estimated Cost - $85,000

4. **Connector Road between Old County Road and Pantego Street** - This short road segment will provide a direct connection between Old County Road and Pantego Street. This will ultimately create an east-west facility across Town between US 264 and residential areas. It also intersects many north-south routes which provide access to NC 99, US 264, schools, and the Central Business District.

The intersection of Old County Road, Pantego Street, and Washington Street is currently a five-legged intersection which is very confusing. The construction of the connector road should improve the functioning of the

intersection and enable a more direct flow of traffic across Town.

Estimated Cost - $87,000

5. **Widen Old County Road to two twelve foot lanes between the US 264 Bypass and Lee Street** - This two lane facility is a major east-west route across Town. It runs parallel to Main Street and intersects the Major Thoroughfare of US 264. It will increase in importance with the proposed connector road to Pantego Street which will provide a continuous route between US 264 Alternate and the US 264 Bypass. Widening Old County Road to two twelve foot lanes will improve safety and traffic flow.

Estimated Cost - $88,000

6. **Widen Pantego Street to two twelve foot lanes between Harbinger Street and the US 264 Bypass** - The segment of this minor thoroughfare extends the east-west connection across Town previously discussed through the residential area west of the US 264 Bypass. It also intersects the north-south minor thoroughfare of Harbinger Street.

Estimated Cost - $590,650

TABLE 5

Belhaven Thoroughfare Plan Cost Estimates - Benefits - and Probable Impacts

DESCRIPTION	CONST. COST $1000	ROW COST $1000	TOTAL COST $1000	USER BENEFITS $1000	ECONOMIC DEVELOPMENT	ENVIRONMENTAL IMPACTS	
						POSITIVE	NEGATIVE
US 264 Bypass and Multi-Lane NC 99 and US 264	17,750	250	18,000	121,588	0.60	0.00	0.25
Harbinger Street Widening	84	-0-	84	*	0.10	0.00	0.25
Old County Rd/Pamlico Intersection Improvement	80	5	85	*	0.15	0.00	0.00
Connector Road Between Old County Rd and Pantego	80	7	87	*	0.20	0.00	0.10
Widen Old County Road	88	-0-	88	*	0.20	0.00	0.15
Widen Pantego Street	120	-0-	120	*	0.15	0.00	0.05

*These projects are for safety considerations and do not have estimated costs and benefits provided for each project.

NOTE: The benefits are a summation of estimated operating, user time and accident cost saving 1991-2015. Estimated construction and right-of-way costs are in 1991 dollars.

PRIORITY NUMBERS 1 - 6

LEGEND

	EXISTING	PROPOSED
MAJOR THOROUGHFARE	▬	
MINOR THOROUGHFARE	▬	▬ ▬ ▬

US-264 BYPASS

US-264

US-264 ALT.

1

2

3

4

5

6

MARSHBURGER ST.

CALIFORNIA ST.

OLD COUNTY RD.

GEORGE ST.

PANTEGO ST.

WASHINGTON ST.

RAILROAD ST.

MAIN ST.

PAMLICO ST.

EDWARD ST.

HASLIN ST.

WATER ST.

TOOLEY ST.

RIVERVIEW ST.

BAYALINE CREEK

TOOLEY CREEK

PANTEGO CREEK

PUNGO RIVER

NC 99

RECOMMENDED CONSTRUCTION PRIORITIES

FIGURE 11

THOROUGHFARE PLAN

March 16, 1992

BELHAVEN
NORTH CAROLINA

400 200 0 400 800

SCALE IN FEET

March 16, 1992

April 15, 1992

May 8, 1992

FIGURE 12

RECOMMENDED PROJECT LOCATIONS

US 264 BYPASS

US 264 AT SR 1714 (SEED TICK NECK ROAD)

SR 1714 (SEED TICK NECK ROAD)

FIGURE 12

RECOMMENDED PROJECT LOCATIONS

MULTI-LANE NC 99

MULTI-LANE US264 BYPASS

WIDEN HARBINGER STREET TO TWO 12 FOOT LANES
FROM US 264 TO PANTEGO STREET

REALIGN THE INTERSECTION OF OLD COUNTY ROAD
WITH PAMLICO STREET

FIGURE 12

RECOMMENDED PROJECT LOCATIONS

CONSTRUCT A CONNECTOR ROAD BETWEEN OLD COUNTY ROAD AND PANTEGO STREET

CONSTRUCT A CONNECTOR ROAD BETWEEN OLD COUNTY ROAD AND PANTEGO STREET

FIGURE 12

RECOMMENDED PROJECT LOCATIONS

WIDEN OLD COUNTY ROAD TO TWO 12 FOOT LANES FROM THE US 264 BYPASS TO LEE STREE

WIDEN PANTEGO STREET TO TWO 12 FOOT LANES FROM HARBINGER STREET TO THE US 264 BYPASS

VII. IMPLEMENTATION

There are several tools which are available for implementation of the thoroughfare plan. They are as follows:

State and Municipal Adoption of the Thoroughfare Plan

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provides that after development of a thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Department of Transportation to serve as the basis for future street and highway improvements. The General Statutes also require that, as part of the plan, the governing body of the municipality and Department of Transportation shall reach agreement on responsibilities for existing and proposed streets and highways included in the plan. Facilities which are designated a State responsibility will be constructed and maintained by the Division of Highways. Facilities which are designated a municipal responsibility will be constructed and maintained by the municipality.

After mutual plan adoption, the Department of Transportation will initiate negotiations leading to determining which of the existing and proposed thoroughfares will be a Department responsibility and which will be a municipal responsibility. Chapter 136, Article 3A, Section 136-66.1 of the General Statutes provides guidance in the delineation of responsibilities. In summary, these statutes provide that the Department of Transportation shall be responsible for those facilities which serve volumes of through traffic and traffic from outside the area to major business, industrial, governmental, and institutional destinations located inside the municipality. The municipality is responsible for those facilities which serve primarily internal travel.

Thoroughfare plan adoption enables other planning tools such as the subdivision ordinance, zoning ordinance, official street map, and capital improvement program to be used to assist in plan implementation and thus minimize public cost and land use disruption.

Subdivision Control

A subdivision ordinance requires that every subdivider submit to the Town Planning Commission a plot of his or her proposed subdivision. Certain standards must be met by the developer before he or she can be issued a building permit to construct the development. Through this process, it is possible to reserve or protect the necessary right of way for proposed streets which are a part of the thoroughfare plan and to require street construction in accordance with the plan.

Since many of the proposed thoroughfares are outside the existing Belhaven Corporate Limits, it is recommended that additional building setbacks and/or right-of-way reservation conforming to the Thoroughfare Plan also be applied in the extraterritorial jurisdiction area. This will allow for orderly implementation of the plan in Belhaaven's fringe areas without disrupting adjoining land owners.

Most of the improvements recommended in Appendix C could be expedited through a subdivision ordinance, especially the proposed connection of Old County Road with Pantego Street.

Roadway Corridor Official Map

North Carolina General Statutes 136-44.50 through 133-44.53 are collectively designated as the "Roadway Corridor Official Map Act." For cities contemplating the adoption of a Roadway Corridor Map, more commonly referred to as an Official Street Map, there are several things to consider prior to implementation. First and foremost, it should be recognized that an Official Street Map designation places severe, but temporary, restrictions on private property rights. These restrictions are in the form of a prohibition for a period of up to three years on the issuance of building permits or the approval of subdivision of property lying within an Official Street Map corridor. This authority should be used carefully and only in cases were less restrictive powers will be ineffective. The Proposed Southern Loop is an example of a facility that could protected by using an Official Street Map.

The Statute establishing the Official Street Map authority is fairly explicit in outlining the procedures to be followed and the types of projects to be considered. As required by the Statute, a project being considered for an Official Street Map must be programmed in the State's Transportation Improvement Program (TIP) or included in a locally adopted Capital improvements Program in addition to appearing on the adopted street system plan. The Statute states that the Capital Improvements Program must be for a period of ten years or less and must identify the estimated cost of acquisition and construction of the proposed project as well as the anticipated financing.

The Program and Policy Branch of the North Carolina Department of Transportation is responsible for facilitating the adoption of Official Street Maps. Cities considering Official Street Map projects should contact this Branch for their "Guidelines for Municipalities Considering Adoption of Roadway Corridor Maps" at:

NC Department of Transportation
Program and Policy Branch
Post Office Box 25210
Raleigh, NC 27611

Zoning

A zoning ordinance can be beneficial to thoroughfare planning by designating appropriate locations of various land uses and allowable densities of residential development. This provides a degree of stability on which to make future traffic projections and to plan streets and highways.

Other benefits of a good zoning ordinance are: (1) the establishment of standards of development which will aid traffic operations on major thoroughfares and (2) the minimization of strip commercial development which creates traffic friction and increases the traffic accident potential.

The zoning ordinance should be structured to control strip development along the thoroughfares. US 264 through Mooresville already has some strip development and continuing to allow this type of development in the future without strict zoning controls will exacerbate traffic congestion on these facilities.

Urban Renewal

Urban renewal is defined as the rehabilitation of city areas by demolishing, remodeling, or repairing existing structures in accordance with comprehensive plans. This process allows for corrections to basic problems in the street system layout and design.

To qualify for community development funds or discretionary funds for urban renewal, a city must first prepare a community development program. Urban areas compete throughout the State on the basis of demographic points which consider such conditions as percent of substandard housing, people per square feet of housing, dwelling age, etc. An effort should be made to ensure that community development and transportation plans are compatible.

Capital Improvements Program

One of the tools which makes it easier to build a planned thoroughfare system is a capital improvements program. This is a long range budget for street improvements, acquisition of right-of-way, and other capital improvements on the basis of projected revenues. Municipal funds should be available for construction of street improvements which are a municipal responsibility, right-of-way cost sharing on facilities designated a Division of Highways responsibility, and advance purchase of right-of-way where such action is required.

The improvement groupings in this report should provide a basis on which the Town of Belhaven can develop their Capital Improvements Program. This program can be used to benefit any of the many existing and proposed local thoroughfares listed in this plan.

Development Reviews

Driveway access to a State-maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation prior to access being permitted. Any development expected to generate large volumes of traffic (ie. shopping centers, fast food restaurants, large industries, etc.) may be comprehensively studied by staff from the Traffic Engineering, Planning and Environmental, and Roadway Design Branches of NCDOT. If done at an early stage, it is often possible to significantly improve the development's accessibility at minimal expense. Since the municipality is the first point of contact for the developer, it is important that the municipality advise them of this review requirement and cooperate in the review process.

Other Funding Sources

1. Assess user impact fees to fund transportation projects. These fees, called "facility fees" in the legislation, are to be based upon "reasonable and uniform considerations of capital costs to be incurred by the town as a result of new construction. The facility fee must bear a direct relationship to additional or expanded public capital costs of the community service facilities to be rendered for the inhabitants, occupants of the new construction, or those associated with the development process".

2. Enact a bond issue to fund street improvements.

3. Continue to work with NCDOT to have local projects included in the Transportation Improvement Program (TIP).

4. Consider the possibility of specific projects qualifying for federal demonstration project funds.

5. Adopt a collector street plan that would assess buyer or property owners for street improvement.

6. Charge a special assessment for utilities; for example, increase water and sewer bills to cover the cost of street improvements.

APPENDIX A

LEVEL OF SERVICE DEFINITIONS

A good indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely at a desirable speed. The ability of a street to move traffic freely, safely, and efficiently with a minimum delay is controlled principally by the spacing of major devices utilized. Thus, the ability of a street to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by the application of other traffic engineering techniques.

Capacity is defined as the maximum number of vehicles which has a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given time period under prevailing roadway and traffic conditions.[1] The relationship of traffic volumes to the capacity of the roadway will determine level of service being provided. Six levels of service have been selected to identify the conditions existing under various speed and volume conditions on a highway or street. The six levels of service, as shown in Figure 13, are:

1. Level-of-service A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

2. Level-of-service B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

3. Level-of-service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and

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[1] Highway Capacity Manual, Special Report 209, 1985, p. 1-3.

levels are extremely poor. Driver and pedestrian

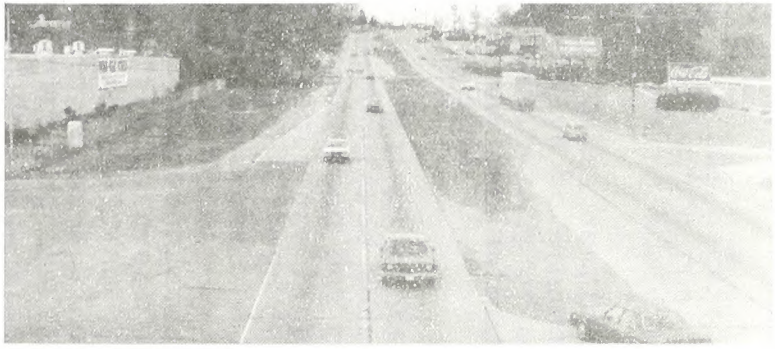
frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.
maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

4. Level-of-service D represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted. The driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

5. Level-of-service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience

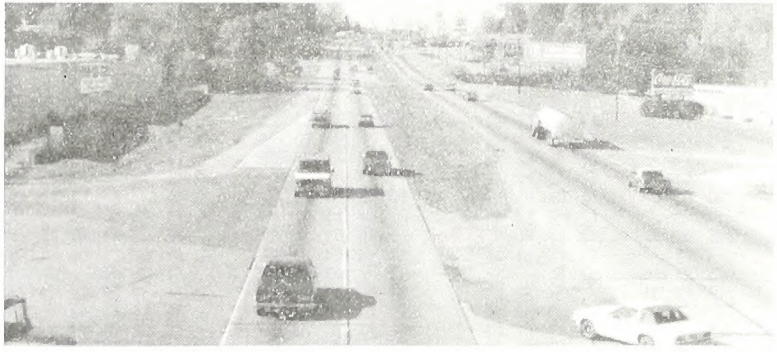
6. Level-of-service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. In many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. It is the point at which arrival flow exceeds discharge flow which causes the queue to form. Level-of-service F is an appropriate designation for such points.

The recommended improvements and overall design of the Thoroughfare Plan were based on achieving a minimum of LOS D on existing facilities, and LOS C on new facilities. LOS D is considered the **"practical capacity"** of a facility, or that at which the public begins to express dissatisfaction.



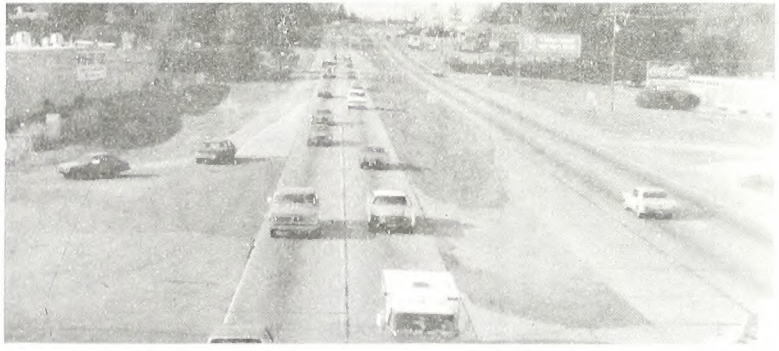
LEVEL OF SERVICE - A

LEVEL OF SERVICE - D



LEVEL OF SERVICE - B

LEVEL OF SERVICE - E



LEVEL OF SERVICE - C

LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE 13

APPENDIX B

TYPICAL CROSS SECTIONS

Typical cross sections recommended by the Statewide Planning Group are shown in the following diagrams of Figure 14.

Cross section "A" is illustrative for controlled access freeways. The 46 foot grassed median is the least desirable median width, but there could be some variation from this depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is 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 feet is recommended with 30 feet being desirable.

Typical cross section "H" 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.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I". Cross section "J" and "K" are usually recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" 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.

The curb and gutter urban 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 further away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

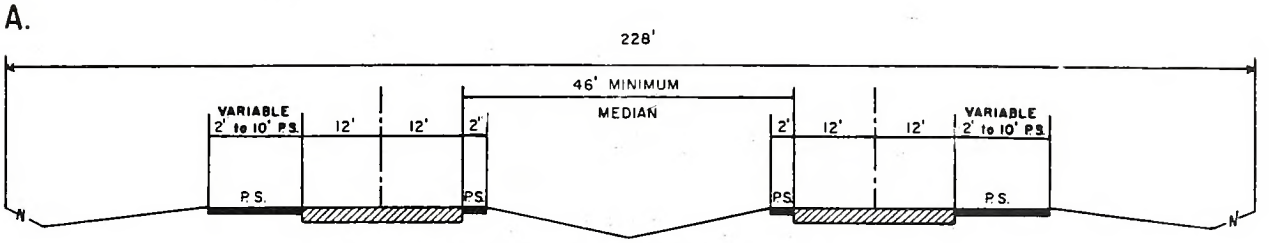
Rights-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming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

If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for design standards for bicycle facilities.

Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service, and available right-of-way.

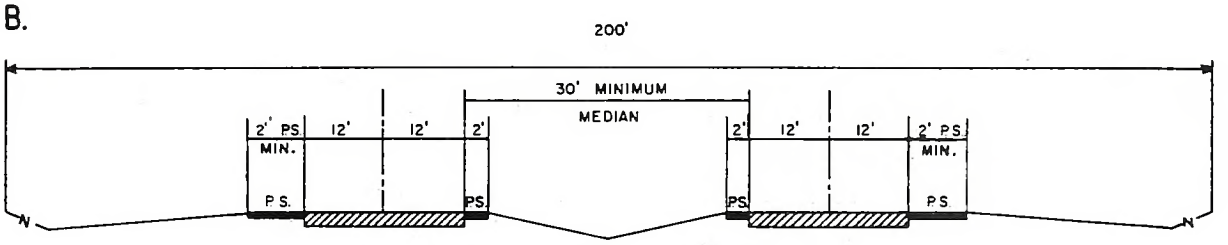
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



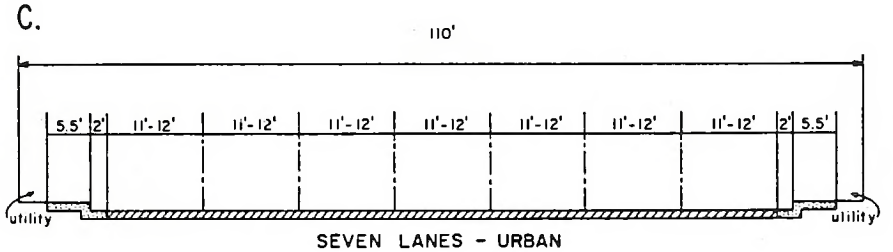
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



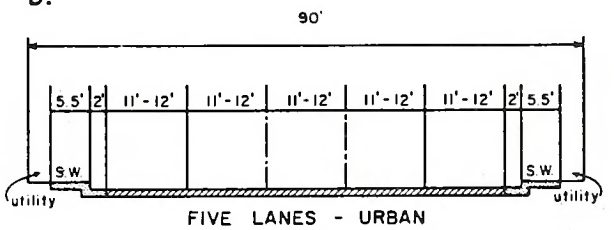
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



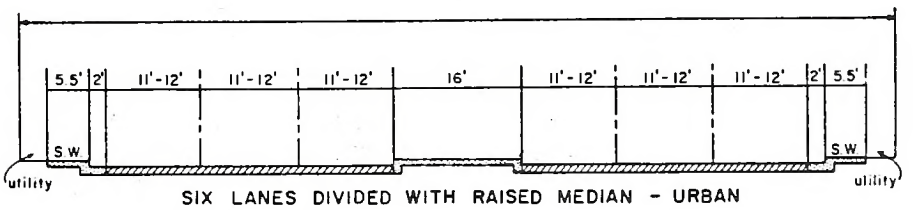
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

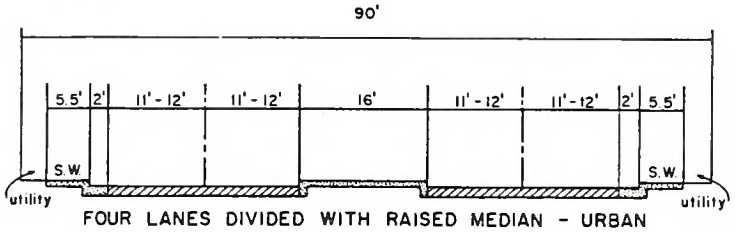
E.



SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

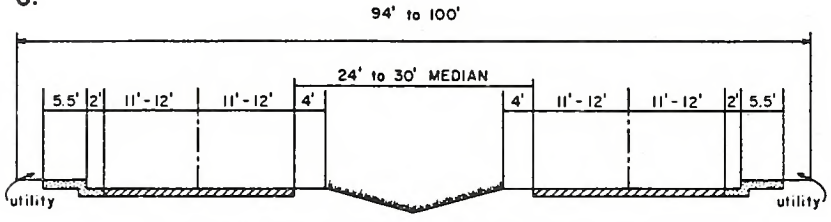
TYPICAL THOROUGHFARE CROSS SECTIONS
(CONTINUED)

F.



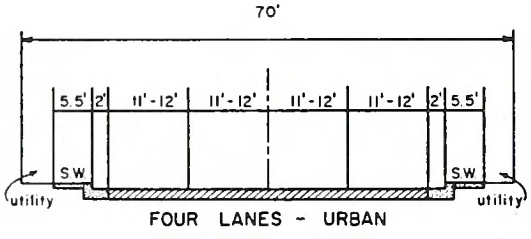
FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



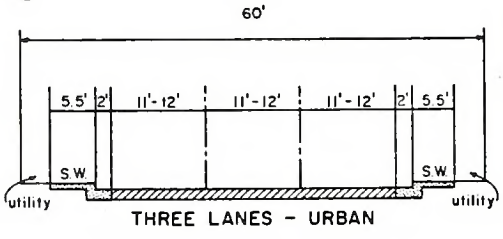
FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



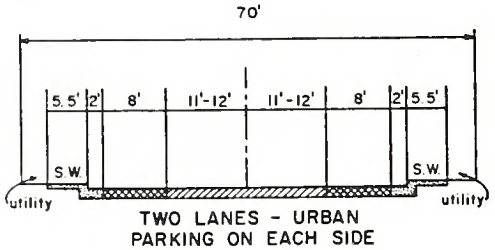
FOUR LANES - URBAN

I.



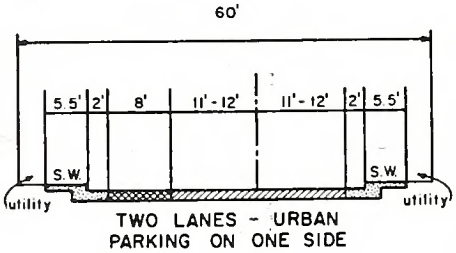
THREE LANES - URBAN

J.



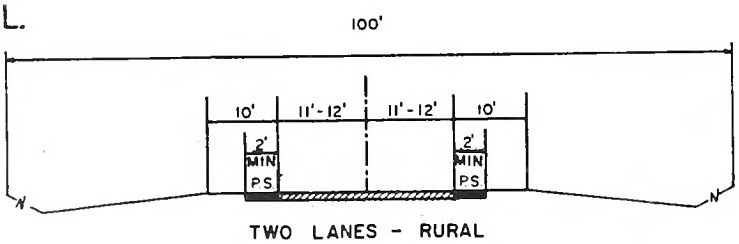
TWO LANES - URBAN
PARKING ON EACH SIDE

K.



TWO LANES - URBAN
PARKING ON ONE SIDE

L.

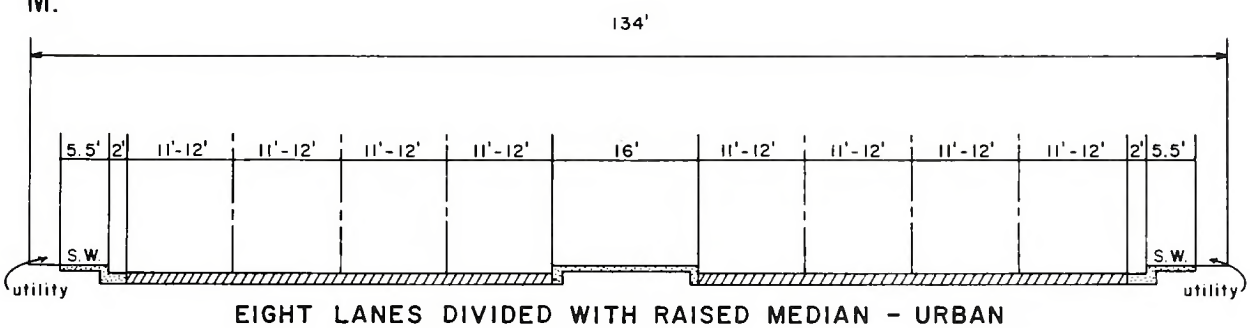


TWO LANES - RURAL

TYPICAL THOROUGHFARE CROSS SECTIONS

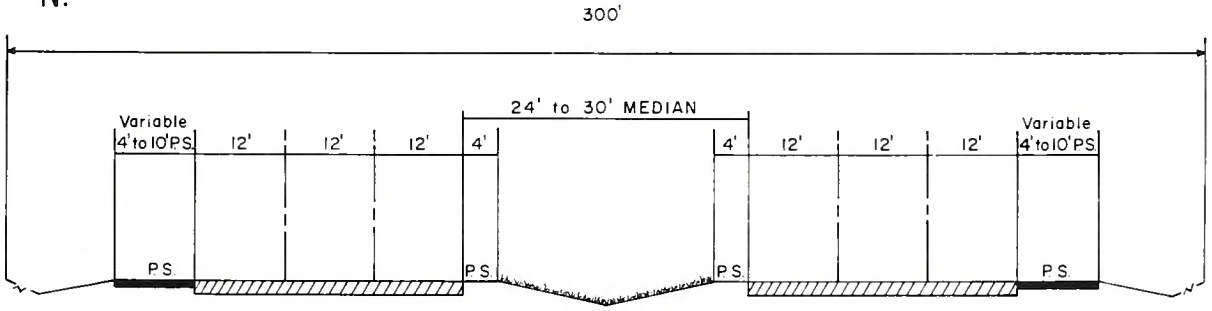
(CONTINUED)

M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - URBAN

N.



SIX LANES DIVIDED - RURAL FREEWAY
GRASS MEDIAN

APPENDIX C
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	1990 ADT	2010 ADT	2015 ADT	RECOMMENDED X - SECTION RDWY (ULT)	ROW (ULT)
EDWARD STREET									
Pantego St. - Water St.	0.36	21	NA	10,000	133	350	600	ADQ	ADQ
GEORGE STREET									
Washington - Railroad St.	0.19	18	NA	10,000	330	600	750	ADQ	ADQ
HARBINGER STREET									
US 264 - Pantego Street	0.21	(36)	NA	(12,000)	258	500	600	K	(60)
HASLIN STREET									
Main St. - Water St.	0.08	20	NA	11,000	1,900	3,500	4,000	ADQ	ADQ
MAIN STREET (US 264 Bus.)									
US 264 Bypass - Haslin St.	0.74	32	60	14,000	6,300	10,000	11,000	ADQ	ADQ
MAIN STREET									
Pamlico St. - Tooley St.	0.57	22	NA	12,000	819	1,200	1,400	ADQ	ADQ
NC 99									
Pantego Creek - Main St.	0.35	60	100	(26,000)	4,100	9,000	13,000	D	100
OLD COUNTY ROAD									
Pantego St. - Extension	0.22	(36)	NA	(12,000)	793	1,500	2,000	(K)	(60)
Extension - Pantego St.	O.08	(36)	-	(12,000)	-	1,500	2,000	(K)	(60)
Pantego St. - Pamlico St.	0.60	24	NA	11,000	793	1,500	2,000	ADQ	ADQ
PAMLICO STREET (US 264 Alt)									
Main St. - Old County Rd.	0.58	44	60	15,000	6,300	10,000	11,000	ADQ	ADQ
Old County Rd. - US 264	1.43	24	60	12,000	1,200	3,500	4,000	ADQ	ADQ
PAMLICO STREET									
Main Street - Water Street	0.09	24	NA	12,000	2,549	5,000	6,000	ADQ	ADQ
PANTEGO STREET									
Harbinger - Old County Rd.	0.30	20	NA	11,000	425	600	700	(K)	(60)
Old County Rd. - Pamlico	0.57	20	NA	11,000	2,779	4,700	6,000	ADQ	ADQ
Pamlico St. - Tooley St.	0.44	20	NA	11,000	431	700	900	ADQ	ADQ
RAILROAD STREET									
George St. - Main St.	0.45	22	NA	11,000	428	800	950	ADQ	ADQ

ADQ - ADEQUATE
NA - NOT AVAILABLE

APPENDIX C
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	1990 ADT	2010 ADT	2015 ADT	RECOMMENDED X - SECTION RDWY (ULT)	ROW (ULT)
RIVERVIEW STREET									
Main St. - Water St.	0.08	22	NA	11,000	555	850	1,000	ADQ	ADQ
TOOLEY STREET									
Pantego St. - Main St.	0.34	22	NA	11,000	163	400	500	ADQ	ADQ
US 264									
SR 1706 - Cemetery Road	1.28	24	100	12,000	4,700	7,300	8,000	ADQ	ADQ
Cemetery Road - NC 99	0.44	32	60	14,000	4,700	7,300	8,000	ADQ	ADQ
US 264 BYPASS									
SR 1714 - NC 99	3.70	(48)	100	(24,000)	-	8,000	10,000	H	(70)
NC 99 - Pantego Creek	1.00	(48)	100	(24,000)	-	8,000	10,000	H	(70)
Pantego Creek - Main St.	0.35	(60)	100	(22,000)	4,100	9,000	13,000	D	100
Main St. - Pamlico St.	2.27	(60)	100	(22,000)	5,500	11,500	14,000	D	100
WASHINGTON STREET									
Main St. - George St.	0.44	20	NA	10,000	343	550	700	ADQ	ADQ
WATER STREET									
Haslin St. - Riverview St.	0.66	24	NA	12,000	1,138	3,500	4,200	ADQ	ADQ

ADQ - ADEQUATE
NA - NOT AVAILABLE

APPENDIX D

RECOMMENDED SUBDIVISION ORDINANCES

DEFINITIONS

I. Streets and Roads:

A. 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 intra-state and inter-county service at relatively high overall travel speeds with minimum interference to through movement.

3. Major Collector - A road which serves major intra-county 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.

B. 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.

C. Specific Type Rural or Urban Streets

1. Freeway - Divided multilane highway designed to carry large volumes of traffic at higher 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. (Design speed 70 mph, Operating speed 55 mph to 65 mph)

2. Secondary Freeway - A divided multilane roadway designed to carry moderate volumes of traffic at moderate speeds. The facility provides for the continuous flow of traffic through full control of access and the provision of interchanges or grade separation with no access at cross roads, and no traffic signals. (Design speed 50 - 55 mph, Operating speed 40 -45 mph)

3. Parkway - A divided multilane roadway designed for non-commercial traffic, with full or partial control of access. Grade separations are provided at major intersections and there are no traffic signals.

4. Expressway - A divided multilane roadway designed to carry heavy volumes of traffic with full or partial control of access. Interchanges are provided at major intersections. There may be access to service roads and local streets, but there will be no signalized intersections.

5. Secondary Expressway - A divided multilane roadway designed to carry moderate volumes of traffic at moderate speeds. This facility may have partial control of access with right turn in and right turn out access to abutting property, and interchanges at major intersections. Some minor intersections may have traffic signal control.

6. Urban Arterial - Multilane roadway with signalized intersections, and access to abutting property. May have grass or barrier type median, or middle turn lane.

7. 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.

8. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

9. 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.

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

11. 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.

II. Property

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

B. 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.

C. 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".

III. Subdivision

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

B. 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; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or recombination 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; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved, (3) widening of opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two 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.

C. 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.

D. 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.

DESIGN STANDARDS

I. Streets and Roads

The design of all roads within Belhaven 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 Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by the Town of Belhaven.

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.

A. 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 the Thoroughfare Plan.

		Min. ROW
1.	Rural	
	a. Principle Arterial	
	Freeways	350 ft.
	Other	200 ft.
	b. Minor Arterial	100 ft.
	c. Major Collector	100 ft.
	d. Minor Collector	80 ft.
	e. Local Road	60 ft.[1]
2.	Urban	
	a. Major Thoroughfare other than Freeway and Expressway	90 ft.
	b. Minor Thoroughfare	70 ft.
	c. Local Street	60 ft.[1]
	d. Cul-de-sac	Variable[2]

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. 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. On all cases in which right-of-way 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 right-of-way, not less than sixty feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

B. 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:

---

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

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

1. Local Residential
   Curb and Gutter section: 26 feet, face to face of curb
   Shoulder section: 20 feet to edge of pavement, 4 foot shoulders

2. Residential Collector
   Curb and Gutter section: 34 feet, face to face of curb
   Shoulder section: 20 feet to edge of pavement, 6 foot shoulders

C. 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 Right-of-Way 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 shall be:

DESIGN SPEEDS

Facility Type	Design Speed		
	Desirable	Minimum	
		Level	Rolling
RURAL			
Minor Collector Roads	60	50	40
Local roads including Residential Collectors and Local Residential	50	50[1]	40[1]
URBAN			
Major Thoroughfares other than Freeway or Expressway	60	50	50
Minor Thoroughfares	60	50	40
Local Streets	40	40[2]	30[2]

[1] Based on projected annual average daily traffic of 400-750. In cases where road will serve a limited area and small number of dwelling units, minimum design speeds can be reduced further.

[2] Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

MAXIMUM VERTICAL GRADE		
Design Speed	Terrain Level	Rolling
60	4	5
50	5	6
40	6	7
30		9

b. Minimum grade should not be less than 0.5% .

c. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 150% of the value in the above table.

3. 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 following parameters:

SIGHT DISTANCE				
Design Speed	30	40	50	60
Stopping Sight Distance				
Minimum (ft.)	200	275	400	525
Desirable Minimum (ft.)	200	325	475	650
Minimum K[1] Value for:				
Crest curve	30	80	160	310
Sag curve	40	70	110	160

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)

[1] K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet 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, 1984".

4. The "Superelevation Table" below shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter of 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

SUPERELEVATION TABLE

Design Speed	Maximum e*	Minimum Radius ft.	Max. Deg. of Curve.
30	0.04	302	19 00′
40	0.04	573	10 00′
50	0.04	955	6 00′
60	0.04	1,528	3 45′
30	0.06	273	21 00′
40	0.06	509	11 15′
50	0.06	849	6 45′
60	0.06	1,380	4 15′
30	0.08	252	22 45′
40	0.08	468	12 15′
50	0.08	764	7 30′
60	0.08	1,206	4 45′

e* = rate of roadway superelevation, foot per foot

D. 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. No street should intersect a railroad at grade at an angle less than (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. Off-set intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs shall not be more than five hundred (500) feet in length (for control of speed, visual detection of a dead end street, and for fire protection). The distance from the edge of pavement on the vehicular turnaround 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 turnaround. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. 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 provision is make 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 twenty (20) feet.

3. Deadend alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turnaround facilities at the deadend as may be required by the Planning Board.

G. 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.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from 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.

I. 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.

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

   a. Shoulder section approach

      i. Under 800 ADT design year

         Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

      ii. 800 - 2000 ADT design year

         Minimum 34 feet width face to face of parapets of rails or pavement width plus 12 feet, whichever is greater.

      iii. Over 2000 ADT design year

         Minimum width of 40 feet, desirable width of 44 feet width face to face of parapets or rails.

   b. Curbs and gutter approach

      i. Under 800 ADT design year

         Minimum 24 feet face to face of curbs.

      ii. 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 of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'6" minimum, or greater if sidewalks are required.

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

   a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 8' minimum, 10' desirable.)

   b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.