SWAIN COUNTY

THOROUGHFARE PLAN

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PRELIMINARY THOROUGHFARE PLAN

for

Swain County, North Carolina

Prepared by:

Planning and Research Branch,
Division of Highways,
N. C. Department of Transportation

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I. INTRODUCTION

The economic and social well-being of a region is largely dependent upon an adequate overall transportation system. Unless people and goods are able to move from one place to another quickly and conveniently, the area becomes dormant and unable to develop to its full economic potential. Realizing the key role that highways play in this transportation system, it has become increasingly necessary to develop a good continuous network of national, state, and regional highways which can efficiently handle present and anticipated traffic needs.

Swain County has undoubtedly been adversely affected by severe topographic barriers which have historically restricted the development of an intigrated system of roads and highways. The improvement of US 19 could help to improve economic condition in the County. The following thoroughfare plan is designed to provide a network of arterial roads, and major and minor collector roads, which will become the backbone of the county road system.

The proposed system of thoroughfares was developed following the basic principles of thoroughfare planning as described in Section II of this report. Thoroughfares were located based upon field investigations, existing and anticipated land use and population distribution, and topographic conditions. The plan advocates those improvements which are felt to be essential for proper traffic circulation within the current planning period (1977-1995).

Proposed improvements within the county plan will be primarily the responsibility of the Department of Transportation. However, Swain County through the use of subdivision and zoning controls can do much towards the implementation of the plan. Thus, it is desirable that the plan be formally approved by both county and the Department of Transportation to serve as a mutual official guide in the development of the thoroughfare system.

II. COUNTY THOROUGHFARE PLANNING PRINCIPLES

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to assure that the road system will be progressively developed in such a manner as to adequately serve future travel desires. Thus, the cardinal concept of thoroughfare planning is that provisions be made for street and highway improvements so that as needs arise feasible opportunities to make improvements exists.

The major benefits derived from thoroughfare planning are: (1) Each road or highway can be designed to perform a specific function and to provide a specific level of service. This permits savings in rights-of-way, construction, and maintenance costs; protects residential neighborhoods; and encourages stability in travel and land use patterns. (2) Local officials are informed as to future improvements. Developers can design subdivisions to function in a non-conflicting manner. School and park officials can better locate their facilities. Irretrivable damage to property values and community appearance, as is sometimes associated with improvements programs, can be minimized.

County Thoroughfare Planning Concept

Streets, roads, and highways perform two primary functions--they provide traffic service and land service. These two functions when combined are basically incompatible. The conflict is not serious if both traffic and land service demands are low. But when traffic volumes are high conflicts created by uncontrolled and intensely used abutting property result in intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets, roads and highways which permit travel from origins to destinations with directness, ease, and safety. Different elements in the system are designed and called on to perform specific functions and levels of service, thus minimizing the traffic and land service conflict.

Within the county plan elements are considered to be either urban or rural. In the urban planning area, the local municipality generally has planning jurisdiction. Outside the urban planning area, the County has planning jurisdiction. In those urban areas were no urban thoroughfare plan has been

developed, elements are generally considered to be rural and under the planning jurisdiction of the county. When a thoroughfare plan is developed for an urban area that has not previously had a plan, then the area defined by that plan would be considered urban and come under the planning jurisdiction of the municipality. A thoroughfare plan was developed for the Bryson City Urban Area and mutually approved by the municipality and the Highway Commission (Board of Transportation) in 1967. A thoroughfare plan was developed and approved for the Cherokee area in 1974.

Within the urban and rural systems, thoroughfare plan elements are classified according to the specific function which they are to perform. A discussion of the elements and functions of the rural system follows:

Rural Thoroughfare Classification System

The rural system consists of those facilities outside the urban thoroughfare planning area boundaries. They are classified into four major systems: principal arterials, minor arterials, major and minor collector roads, and local roads. Table 1 indicates generally accepted statewide mileage on these systems.

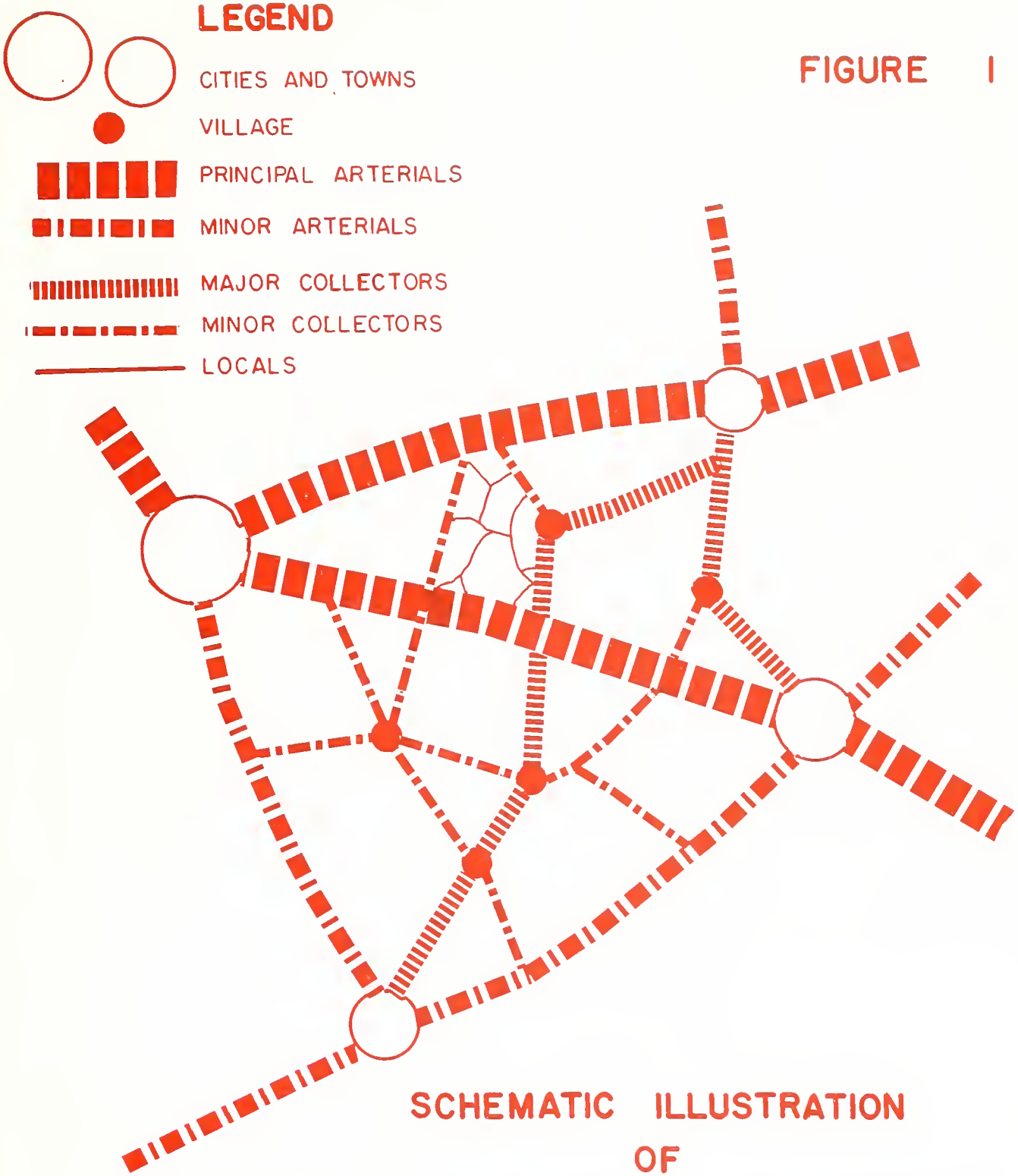
Table 1. Rural System Road Mileage Distribution

Systems	Percentage of Total Rural Miles
Principal arterial system	2-4
Principal arterial system plus minor arterial road system	6-12
Collector (major plus minor) road system	20-25
Local road system	65-75

Figure 1 gives a schematic illustration of a functionally classified rural highway system.

Rural Principal Arterial System: The rural principal arterial system consists of a connected network of

FIGURE 1



SCHEMATIC ILLUSTRATION
OF
FUNCTIONALLY CLASSIFIED RURAL HIGHWAY
NETWORK

continuous routes which serve corridor movements having trip lengths and travel density characteristics indicative of substantial statewide or interstate travel. The principal arterial system should serve all urban areas of over 50,000 population and a large majority of those with a population greater than 5,000. The Interstate System constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System: The minor arterial system in conjunction with the principal arterial system forms a network which link cities, larger towns, and other major traffic generators such as large resorts. The minor thoroughfare system generally serves interstate and intercounty travel and serves travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

Rural Collector Road System: The rural collector routes generally serve travel of primarily intra-county rather than statewide importance and constitute those routes on which predominant travel distances are shorter than on the arterial routes. This system is subclassified into major collector roads and minor collector roads.

> Major Collector Roads: These routes (1) provide service to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intra-county importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intra-county travel corridors.
>
> Minor Collector Roads: These routes (1) collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.

Rural Local Road System: The local roads comprise all roads not on one of the higher systems.

III. CLAY COUNTY-PAST, PRESENT AND FUTURE

Swain County lies in the mountainous area of the most western portion of North Carolina. (Figure 2). The county contains 553 square miles, and a 1970 population of 7,861 people. Swain County is one of the most rugged counties in Eastern America, ranging in elevation from 1086 feet on the Little Tennessee River at the Tennessee state line to 6642 feet at Clingman's Dome. The county is primarily a rural county with 75% of the land area being national park land, lakes, and national forests.

The climate of Swain County is mild in the valley with some snow but very few long periods of severe cold.

Population Trends

Swain County experienced a continious decline in population between 1940 and 1970 with a decrease of 4,316 people. The percentage of population decline during census periods ranged from 18% to 6% during this thirty year period.

According to population projections the stagnant trend of Swain County during the 1940-1970 period will be replaced by an increase in population between the period 1970 and 1995. The estimated 1995 population of the county is 10,050.

Land Use

Swain County is primarily a rural county, with most of its taxable land given up for the Smoky Mountain National Park, Fontana Lake and Nantahala National Forest. These acquisitions have almost extinguished a thriving lumber industry and have closed valuable mines.

The topography, beauty and climate attracts both retired persons and vacationers. The good fishing and hunting attracts many sportsmen. This semi-public land use traffic generators are the recreational areas.

GEOGRAPHIC LOCATION

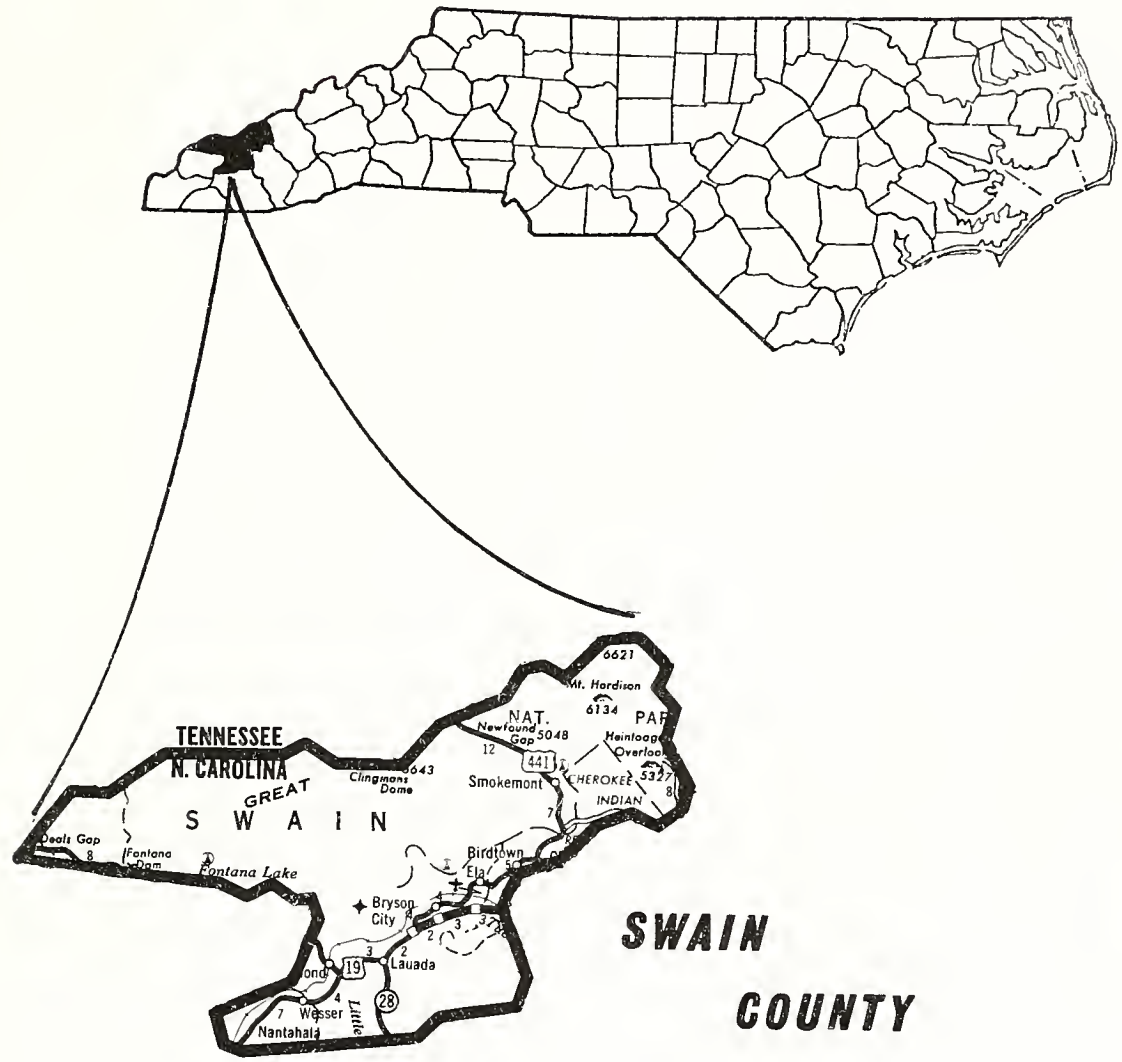


FIGURE 2

Traffic

A comparison of 1963, 1968, 1973, and 1977 average annual daily traffic (ADT) volumes on selected major roads and highways in Swain County is shown in Figure 3. Roads and highways experiencing the most significant changes during this period were US 19 and US 441.

Motor vehicle registration for 1963, 1968, 1973, and 1977 are given in Table 2. A steady increase in both auto and truck registration occurred during the 1963-1977 period even though population decreased.

Table 2. Motor Vehicle Registrations

	1963	1968	1973	1977
Autos	2,505	3,185	4,139	4,171
Trucks	915	1,216	1,693	2,497

On the basis of the forecasted population and motor vehicles registration trends, traffic volumes on most roads in the County should experience moderate increases during the 1977-2000 design period. Exceptions to this would be US 19 and US 441, which would feel the impact of regional traffic growth and may be influenced by additional local recreational development.

LEGEND:

YEAR	ADT
1963 -	0000
1968 -	0000
1973 -	0000
1977 -	0000

NOTE: N.A. = NOT AVAILABLE.

FIGURE 3

ANNUAL AVERAGE DAILY TRAFFIC VOLUMES

SWAIN COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS — PLANNING AND RESEARCH BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE

SCALE FOR ENLARGEMENTS

SHEET 1 OF 1

DIVISION 14 DISTRICT 8 SWAIN COUNTY HSRN Database 173

IV. ANALYSIS OF EXISTING MAJOR ROAD SYSTEM

Any assessment of the existing major road system in Swain County must give consideration to the Appalachian Development Highway System. The Appalachian Regional Commission was established in the mid 1960s by Congress to promote economic growth and development in the Appalachian area. The Commission selected and approved certain highway corridors for major improvement. In Swain County US 19 from Graham County to Bryson City, and US 19A was selected as a corridor for improvement. At the writing of this report the Bryson City Bypass section of the corridor from west of Bryson City to Jackson County has been completed. The section of the corridor from west of NC 28 to the Bryson City Bypass is in right-of-way acquisition. The section from west of NC 28 to Topton in Cherokee County is still under study.

In addition to the Appalachian Development Highway System US 441 south of Cherokee is being improved under the North Carolina Rural Primary Program.

As assessment of the existing highway network was made to determine if it is adequately handling the traffic demands that are being placed upon it. One phase of this assessment was a capacity-volume analysis. Based on levels of service (operating speeds), the practical capacities of the significant roads in the County were determined. Relating the existing volumes to those capacities, it was found that there was no existing significant capacity deficiencies that would not be solved by currently scheduled improvements to the highway system.

There are a number of major roads in the County that have widths of 12, 16, or 18 feet. Standards established by the American Association of State Highway Officials (AASHO) set 20 feet as a minimum width with 24 feet as a preferred width.

LEGEND

	EXISTING	PROPOSED
PRINCIPAL ARTERIALS		
MINOR ARTERIALS		
MAJOR COLLECTORS		
MINOR COLLECTORS		
URBAN MAJOR THOROUGHFARES		
URBAN THOROUGHFARE PLANNING AREA BOUNDARY		

FIGURE 4

THOROUGHFARE PLAN
SWAIN COUNTY
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS — PLANNING AND RESEARCH BRANCH
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FEDERAL HIGHWAY ADMINISTRATION

V. THOROUGHFARE SYSTEM

The recommended thoroughfare plan for Swain County is shown in Figure 4. The thoroughfare plan was developed around the already established highway network with only a few alterations to the system.

Principal Arterials

The principal arterial system in Swain County consists of the route scheduled for improvement under the Appalachian Development Highway System--US 19-19A.

Minor Arterials

The minor arterials in conjunction with the principal arterial system form a network which link the cities and larger towns of the region. The minor arterial routes that are included in the plan are US 441, US 129 between Tennessee and NC 28, NC 28 between US 129 and US 19, NC 28 between US 19 and Macon County, US 19 from Bryson City to Jackson County, and the Blue Ridge Parkway.

Collector Road System

The rural collector routes will serve primarily intra-county travel. The major collector roads will supplement the minor arterial system by providing an inter-connecting network between smaller population centers and connecting the smaller population centers to the arterial routes. The minor collector roads will collect traffic from the local roads and carry it to the higher system roads. Proposed major and minor collector roads in Swain County are as follows:

Major Collector Roads

1. US 129 between Graham County and NC 28
2. SR 1195 (Old US 19A) between Jackson County and US 19

Minor Collector Roads

1. Big Cove Road from Cherokee Planning Area to Straight Fork Road
2. SR 1103 between US 19 AND SR 1105
3. SR 1113 between US 19-NC 28 and SR 1114 and SR 1114 to Macon County
4. SR 1140 between US 19 and the easternmost intersection with SR 1137, and SR 1137
5. SR 1168 between the Bryson City Bypass and US 19 at Ela
6. SR 1177 between Jackson County and SR 1122
7. SR 1309 between US 19 and SR 1311, SR 1311, between SR 1309 and SR 1312, SR 1312, and SR 1311 between SR 1312 and the Bryson City Planning Area
8. SR 1337 between Bryson City Planning Area and SR 1338, a Federal Government Road between SR 1338 and SR 1351, and SR 1351
9. SR 1355 between US 19 and SR 1356

VI. DESIGN REQUIREMENTS

Design requirement for roads and highways vary according to the desired capacity and level of service to be provided. Thus, universal standards to be followed in design are not practical and each section must be individually analyzed.

The level of service is a function of the ease of movement experienced by motorists using the facility. The ability of a motorist to drive at a desired speed is dependant upon the physical design of the street; the amount and character of traffic generated by abutting property; and imposed speed restrictions. The level of service is generally indicated by the over-all travel speed[1] experienced by traffic. Recommended minimum levels of service for roads and highways included in the proposed Swain County Thoroughfare Plan are given in Table 3.

Table 3

Facility	Overall Travel Speed During Peak Traffic Conditions
Principal Arterials	50-55 MPH
Minor Arterials	50-55 MPH
Major Collector Roads	45-50 MPH
Minor Collector Roads	
Bryson Urban Area	25-35 MPH
Others	40 MPH

From the standpoint of driver convenience, ease of operation, and safety, it would be desirable to widen all highways to provide a minimum land with of 12 feet. However when considering over all statewide needs and available highway revenues, it is found that these levels of improvements applied statewide would be impractical. It is necessary, therefore, to establish minimum tolerable widths with respect to traffic demands which would be economically feasible. Table 4 gives the widths used in determining the existing lane deficiencies in the County.

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[1]The overall speed is the total distance traveled divided by the total time required, including all traffic delays.

Table 4. Minimum Tolerable Lane Widths

Design Year ADT	Principal Arterials	Minor Arterials	Collectors
Over 2,000	11	11	11
400-2,000	11	10	10
100- 400	11	10	9
Below 101	11	11	9

Typical cross section recommendations for roads and highways included in the thoroughfare plan are shown in Figure 5.

Using historic traffic volume trends, information obtained in the capacity deficiency analysis, and tolerable lane width standards, rural road and highway improvements needed in Swain County were redefined and are listed in the Appendix.

VII. IMPLEMENTATION

There are several tools which are available for use by a county to assist in the implementation of a thoroughfare plan. They are as follows:

State-County Adoption of Thoroughfare Plan

If requested, the Board of Transportation in cooperation with a county will cooperatively develop and mutually approve a county thoroughfare plan. The mutually approved plan would serve as a guide to the Board in the development of the road and highway system of the county. The approval of the plan by the county would enable subdivision regulations and zoning ordinances to be effectively used to assist in the implementation of the plan.

Subdivision Controls

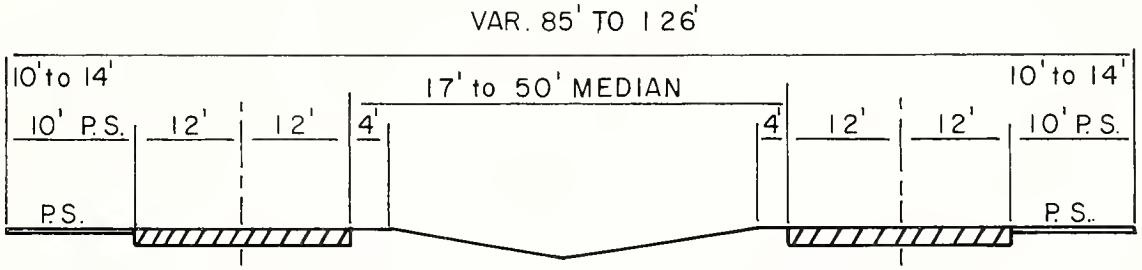
The subdivision regulations requires every subdivider to submit to the county planning commission a plan of his proposed subdivision and requires that the subdivision be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the thoroughfare plan and to reserve or protect necessary rights-of-way for projected roads and highways that are to become a part of the thoroughfare plan. The construction of subdivision streets to adequate standards would reduce maintenance costs and would facilitate the transfer of the streets to the State Highway System.

Zoning

The zoning ordinance is an important tool in that it will regulate future land development and minimize undesirable development along roads and highways. The zoning ordinance can improve highway safety by requiring sufficient building setbacks to provide for adequate sight distances and by requiring off street parking.

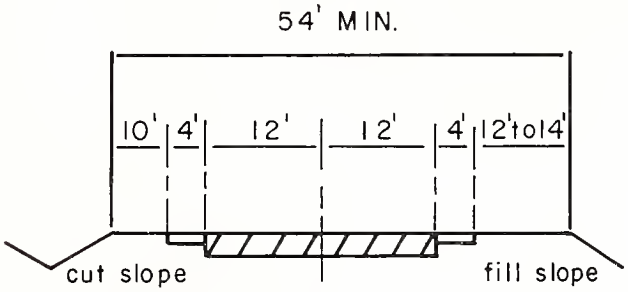
Typical Cross Sections

A



FOUR LANES DIVIDED WITH MEDIAN-RURAL

B



TWO LANES – RURAL

FIGURE 5

APPENDIX

APPENDIX

SWAIN COUNTY THOROUGHFARE

Roadway and Section	Existing Cross Section Pavement	Existing Cross Section ROW	Recommended Cross Section	Desirable ROW	Ultimate Cross Section
US 19					
Macon Co.- Bryson City Planning Area	20'-24'	60'-150'	Adequate		B
Bryson City Planning Area- Cherokee Planning Area	20'-21'	60'	Adequate		
US 19A					
Jackson Co.-Bryson City Planning Area	24'	60'	Adequate		
NC 28					
Graham Co.-US 129	18'	60'	Adequate		B
Macon Co.-Graham Co.	18'	60'	Adequate		B
US 29					
NC 28-Tenn. State line	16'	60'	Adequate		B
US 441					
Cherokee Planning Area- Tenn. State line	20'-22'	60'	Adequate		B

SWAIN COUNTY THOROUGHFARE

Roadway and Section	Existing Cross Section Pavement	ROW	Recommended Cross Section	Desirable ROW	Ultimate Cross Section
SR 1103					
US 19-Milepost 1.00	18'		Adequate		B
SR 1113					
US 19-SR 1114	12'-16'		Adequate		B
SR 1114					
SR 1113-Macon Co. line	10'-12'		Adequate		B
SR 1123					
US 19-SR 1121	10'		Adequate		B
SR 1140					
US 19-SR 1141	10'-16'		Adequate		B
SR 1159					
US 19-SR 1121	10'-14'		Adequate		B
SR 1177					
SR 19A-SR 1122	14'-16'		Adequate		B
SR 1311					
Bryson City Planning Area-SR 1309	12'-20'		B		

APPENDIX

SWAIN COUNTY THOROUGHFARE

Roadway and Section	Existing Cross Section Pavement	ROW	Recommended Cross Section	Desirable ROW	Ultimate Cross Section
SR 1321					
SR 1322-SR 1364	12'-18'		Adequate		B
SR 1323					
SR 1322-US 19	16'-18'		Adequate		B
SR 1329					
Bryson City Planning Area-SR 1331	12'-16'		B		
SR 1337					
Bryson City Planning Area & SR 1338	16'-18'		Adequate		B
SR 1355					
SR 1356-Bryson City Planning Area	12'		B		
SR 1364					
SR 1329-US 19	22'-44'		Adequate		A
SR 1368					
Government Rd.	20'		Adequate		B