North Carolina Department of Transportation
Statewide Planning Branch

FARMVILLE

URBAN AREA THOROUGHFARE PLAN

MAY 1993

1992 THOROUGHFARE PLAN
FOR
FARMVILLE URBAN AREA

Prepared By:

The Statewide Planning Branch
of the Division of Highways
of the North Carolina Department of Transportation

In Cooperation With:

The Town of Farmville

The Federal Highway Administration
of the United States Department of Transportation

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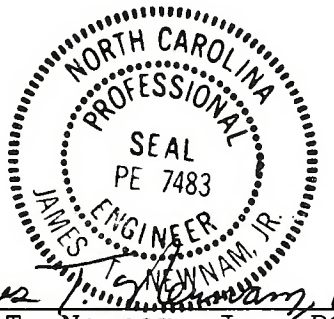

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GLOSSARY OF TERMS

ADT	Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
BOT	Board of Transportation
CAAA	Clean Air Act Amendment
CBD	Central Business District
ISTEA	Intermodal Surface Transportation Efficiency Act
NCDOT	North Carolina Department of Transportation
NPDES	National Pollution Discharge Elimination System
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled

ABSTRACT

The 1992 Farmville Urban Area Thoroughfare Plan depicts travel for 1991 and future years, 2015 and 2020. This plan shall be used as a guide for development in the Farmville Urban Area. This Plan is based on analysis of the existing highway system, population, economy, travel and land use. Future travel is based on projected population, economic conditions and anticipated land use patterns. This Plan has been prepared and coordinated with the Town of Farmville. The Town of Farmville adopted and recommended the plan to the North Carolina Department of Transportation on October 6, 1992. Whereas, the Board of Transportation mutually adopted the Plan on December 4, 1992.

I. INTRODUCTION

Transportation plays a vital role in the development of an area. Business, industrial, and residential communities use it daily as a way of life. A thoroughfare plan takes the needs of these communities and provides a good, safe, and efficient highway system for the present and future.

Farmville's has for a long time been concerned with its transportation. The first thoroughfare plan for Farmville was developed in 1970 (map dated May 7, 1970). The second and latest thoroughfare plan was completed in 1979 (map dated June 27, 1979). However, due to new growth patterns and completion of two thoroughfare items, the Eastern Loop and US 264 Freeway; the Town of Farmville requested an update of their thoroughfare plan.

This thoroughfare plan will set forth a system to serve anticipated traffic and land development needs of the Farmville Urban Area for the next twenty-nine years. Insufficient present and future capacity and maintenance needs are items established in the development of a plan.

The system of thoroughfares proposed follow the basic Principles of Thoroughfare Planning as described in Chapter II of this report. There are many benefits to be derived from thoroughfare planning. The primary objective is to enable major thoroughfares to be progressively developed that will adequately service future traffic demands. The location of thoroughfares depends on field investigation, aerial photos, existing and anticipated land uses, and topographic conditions. It also considers the travel concerns of the community and its public representatives.

Major benefits to be derived from thoroughfare planning are:

(a) A minimum amount of land will be required for street and highway purposes.

(b) Local citizens will be aware of the streets which will be developed as major thoroughfares and thus will have assurance that their residential street will not in the future become a major traffic carrier.

(c) Land developers can design their subdivisions so that subdivision streets will function non-conflictingly with the thoroughfare plan.

It should be emphasized that the recommended plan is based on anticipated growth of current trends of the planning area. Prior to construction of specific projects, a more detailed study will be required to reconsider development trends, specific locations, design requirements, and environmental needs.

II. THOROUGHFARE PLANNING

Basic Principles

The urban street system typically occupies 25 to 30 percent of the total developed land in the urban area. Since the system is permanent and expensive to build and maintain, extensive care and foresight are needed in its development. Thoroughfare planning is the process used by public officials to assure the development of the most logical and appropriate street system to meet future travel desires. The major steps involved in the thoroughfare planning process are:

(1) ***Collection of data*** concerning existing physical development and travel desires within the area.
(2) ***Development of a (computer) model*** which reflects present travel desires.
(3) ***Prediction of future socioeconomic data,*** and computation of future travel desires using the computer model.
(4) *Evaluation* of the adequacy of the existing street system in serving present and future travel.
(5) ***Formulation of the best thoroughfare plan,*** on the basis of travel demand, economic benefits, and environmental considerations, to meet future travel desires.
(6) ***Development of construction priorities*** for plan implementation.
(7) ***Implementation*** of the plan.

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to assure that the street 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 exist.

Some of the benefits derived from thoroughfare planning are:

(1) Each street can be designed to perform a specific function. This permits savings in right-of-way and construction costs; and encourages stability in travel and land use patterns.

(2) Local officials and citizens are informed as to future improvements. Public facilities can be better located; and damage to property and appearance can be minimized (for example: buildings and plants can be located to permit future street widening).

(3) Residents will know which streets will be developed as major thoroughfares and be able to make an informed decision when choosing a home.

(4) City officials will know when improvements will be needed and can schedule funds accordingly.

Efficiency

The improvement of the efficiency of existing facilities can be achieved through the improving of the **system** and **operational efficiency** of thoroughfares.

System Efficiency can reduce travel distances, time, and cost. 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 - they provide **traffic service** and **land service.** These two functions 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 intense land service demands result in **congestion.**

The thoroughfare plan provides a functional system of streets which permits travel with directness, ease, and safety. Different streets in the system are designed to perform specific functions thus minimizing the traffic and land service conflict. Streets can be functionally categorized as: local access streets, minor thoroughfares or major thoroughfares.

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 or destinations on the streets would be served. **Their function is to provide access.** Depending upon the type of land use which they serve, local access streets may be further classified as residential, commercial, and/or industrial.

Minor Thoroughfares are more important streets in the city system. They collect traffic from local access streets and carry it to the major thoroughfare system. They may, in some instances, supplement the major thoroughfare system by aiding minor through movements. A third function which 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. Although undesirable, the streets which comprise the major thoroughfare system may also serve abutting property. However, **their major function is to carry traffic.** They should not be bordered by strip development because such development significantly lowers the capacity of the thoroughfare, and each driveway is a danger to traffic flow. Major thoroughfares may range from two lane streets to expressways with six or more traffic lanes. As a general rule, parking should not be permitted on major thoroughfares.

Figure 1 graphically illustrates the trade-off between the travel service and land service functions of the above types of facilities.

Operational Efficiency increases the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, a street's **capacity** is defined as "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 the vertical and horizontal alignment, eliminating road-side parking and eliminating property access points.

Operational ways to improve street capacity include:

(1) **Control of access** - A roadway with complete access control can carry over two times the traffic handled by a non-controlled access street.

(2) **Parking removal** - Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking operations.

(3) **One-way operation** - The capacity of a street can be increased 50% or more, 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 work and other trips. This reduces the number of vehicles on the roadway while increasing the people carrying capability of the street system.

(2) Encourage the use of public transit, bicycles, and pedestrian travel.

(3) Encourage industries and business to stagger work hours or establish variable work hours for employees. This will reduce travel demand in peak periods and spread peak travel over a longer time period.

Idealized Thoroughfare Plan 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 desired lines of travel within an urban area and which permits movement between various areas of the city within maximum directness is the radial-loop system. This system consists of several functional elements--radial streets, crosstown streets, loop system streets, and bypasses. An idealized thoroughfare plan showing the described facilities is in 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 to follow the area's border and 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 pedestrian shopping area.

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

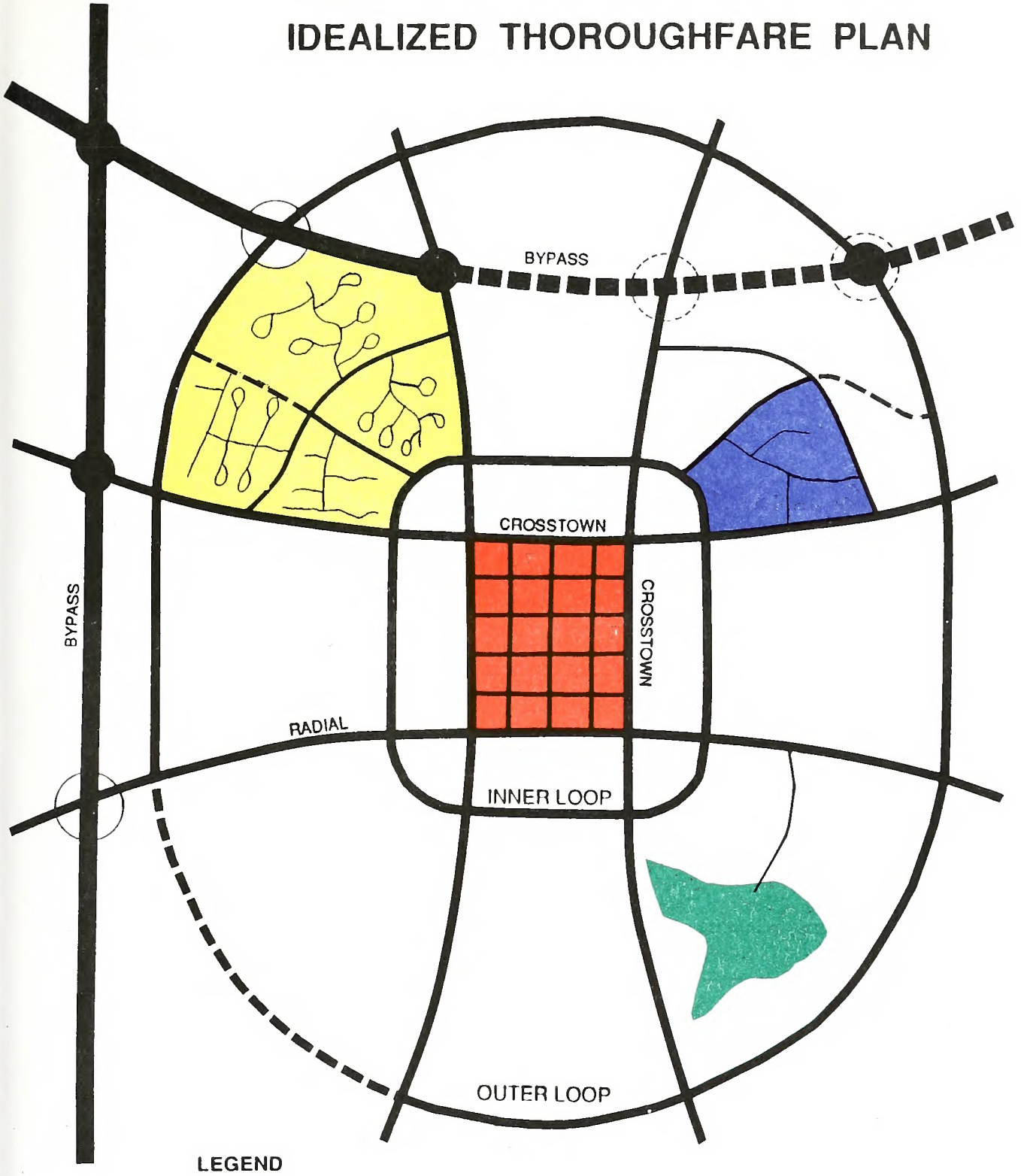
spaced one-half mile to one mile apart, depending on the intensity of land use.

A **bypass** is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing from it 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 above descriptions are of an idealized major thoroughfare system. In actual practice, thoroughfare planning is done for established areas and is constrained by existing land use and street patterns, public attitudes, and expectations of future land use. Compromises must be made because of these, and other factors that may affect major street locations.

IDEALIZED THOROUGHFARE PLAN



LEGEND

	EXISTING	PROPOSED
JOR THOROUGHFARE EEWAY		
JOR OTHER		
IOR THOROUGHFARE		
CAL ROAD		
ERCHANGE		
ADE SEPERATION		

LAND USES

- COMMERCIAL/BUSINESS
- RESIDENTIAL
- INDUSTRIAL
- PUBLIC/INSTITUTIONAL

FIGURE 1

III. Analysis of the Existing Highway System

In analyzing an existing highway system for travel, there are four major factors of many which must be considered. They are (1) population, (2) employment, (3) land use, and (4) traffic. These factors control the type of thoroughfare system an area needs. For instance the more population you have, the more traffic on the highway; or the more desirable the land (residential, commercial, or industrial) the more newcomers will be attracted to the area, thus adding more traffic. These factors dictate what the area needs. The increase in traffic due to these factors influence the future highway system. The most important part in a study is making growth forecasts from existing conditions and converting them into future travel. Setting the groundwork for the future year analysis is very important in model simulation.

Population

Travel is directly related to population. The volume of traffic on a section of roadway is a function of the size and location of the population it serves. An analysis of the population is one of the first steps in planning a highway system. Since 1940 Farmville has encountered increases and decreases in population. However on a whole, it has maintained approximately one percent annual growth rate. Decreasing agricultural activity with increasing commercial and industrial activity in and around Farmville are factors which contribute to these fluctuations. (See Table 1).

Population projections were derived from census data using several methods. Census figures were extrapolated to year 2020 using 1987 data provided by the office of State Budget and Management. Other methods include the growth rate formula, the graphical method, and an estimation of dwelling units with persons per dwelling unit ratio.

TABLE 1 - POPULATION PROJECTIONS

YEAR	NORTH CAROLINA	PITT COUNTY	FARMVILLE TOWNSHIP	FARMVILLE	URBAN AREA
1940	3,571,623	61,244	6,449	2,980	----
1950	4,061,929	63,789	6,169	2,942	----
1960	4,556,155	69,942	6,435	3,997	----
1970	5,084,411	73,900	6,522	4,424	----
1980	5,880,415	90,146	6,602	4,707	6600
1990	6,628,637	107,924	6,521	4,392	7300
2000	**7,260,748**	**114,212**	6,719	4,852	8350
2010	**7,775,979**	**122,871**	6,924	5,359	8750
2015	8,375,423	135,020	7,028	5,632	8966
2020	8,776,538	141,206	7,134	5,920	9166

NOTE: Highlighted figures are estimates from the Office of State Budget and Management, 1987.

Economy & Employment

Farmville has a very good economic base. The employment to population ratio is 46%. An area's economic base is a very important factor. This encourages an active highway system. A town's economic base is largely dependent on how efficiently the street system handles traffic. Economic growth suffers when an inadequate system causes congestion and delay.

Farmville's largest employers are industrial facilities. The industrial category consists of agriculture, mining, construction, manufacturing, transportation and utilities. The industrial category encompasses over 70% of the employment in Farmville. The Manufacturing division encompasses about 75% of the industrial category. (See Table 2).

TABLE 2 - EMPLOYMENT SUMMARY

Categories	1976	1991	2020
Industry	2,225	2,470	2,828
Retail	---	294	336
Hwy. Retail	---	171	197
Office	---	98	112
Service	---	470	537
Non-Industry Sub.	1,310	1,033	1,182
Total	3,535	3,503	4,010

Land Use

The generation of traffic on a particular street is very closely related to the utilization of adjacent land areas. Some types of land uses generate much more traffic than others. For example, a commercial or retail area such as a shopping center would generated or attract much larger volumes of traffic than a residential area. The attraction between different land uses varies with the intensity of the development and the distance between those developed areas. Therefore, it becomes necessary to designate land uses by type for transportation planning. An analysis of the distribution of existing land uses serves as a basis for forecasting future land use needs and the resulting travel patterns. (See Figure 2).

Farmville's Urban Area is 35,650 acres. Sixty-six percent of the urban area is comprised of agricultural purposes. These purposes include cropland, pasture land, and undisturbed forest land. The residential areas make up 22% of the urban area and are mainly in the Town of Farmville. However, there are various subdivisions developing throughout the urban area. Future residential sites are forecasted to develop mainly in the eastern part of the urban area. This forecast was partly based on the Town of Farmville's water and sewage availability and land

FIGURE 2

LAND USE MAP

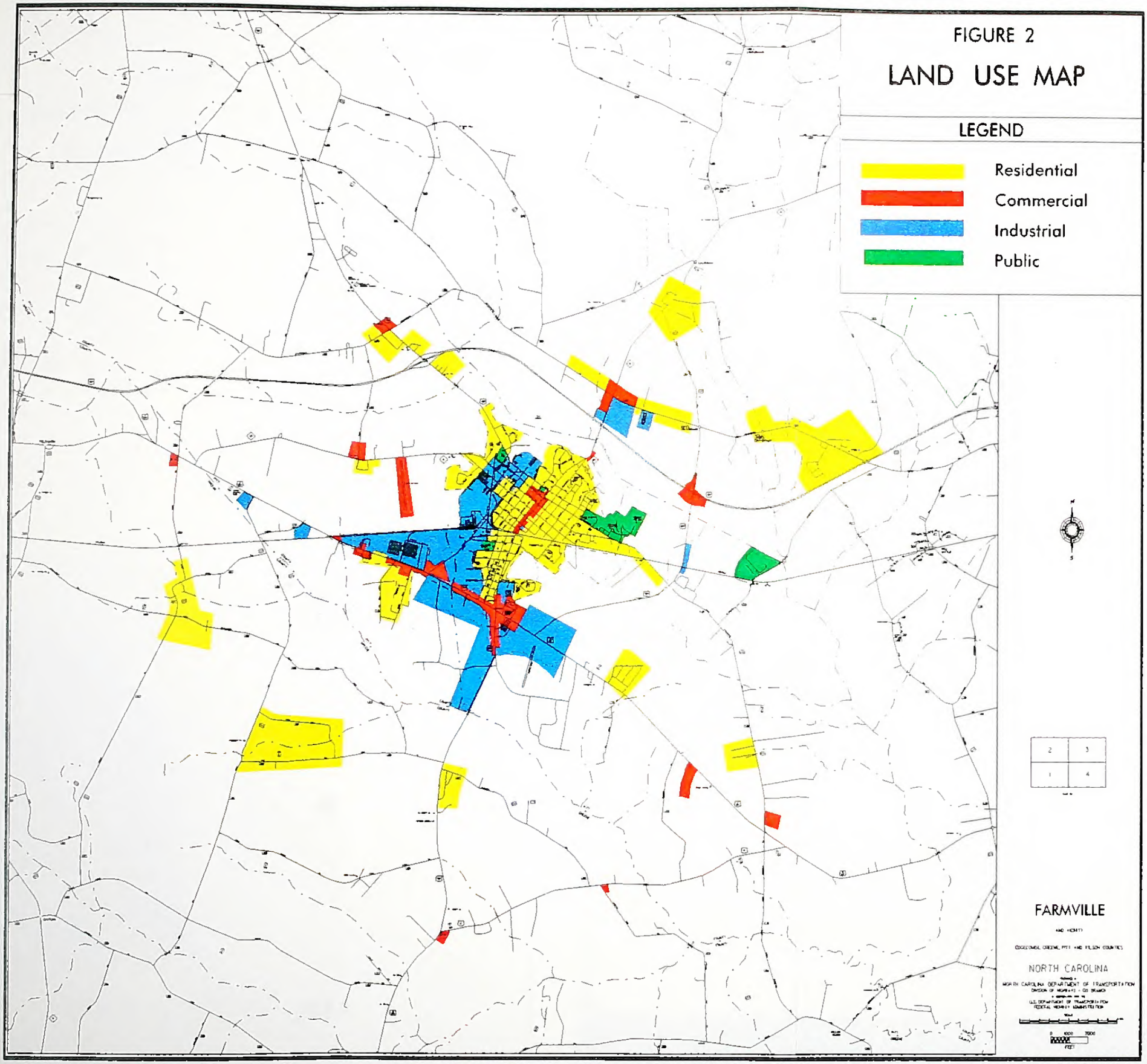
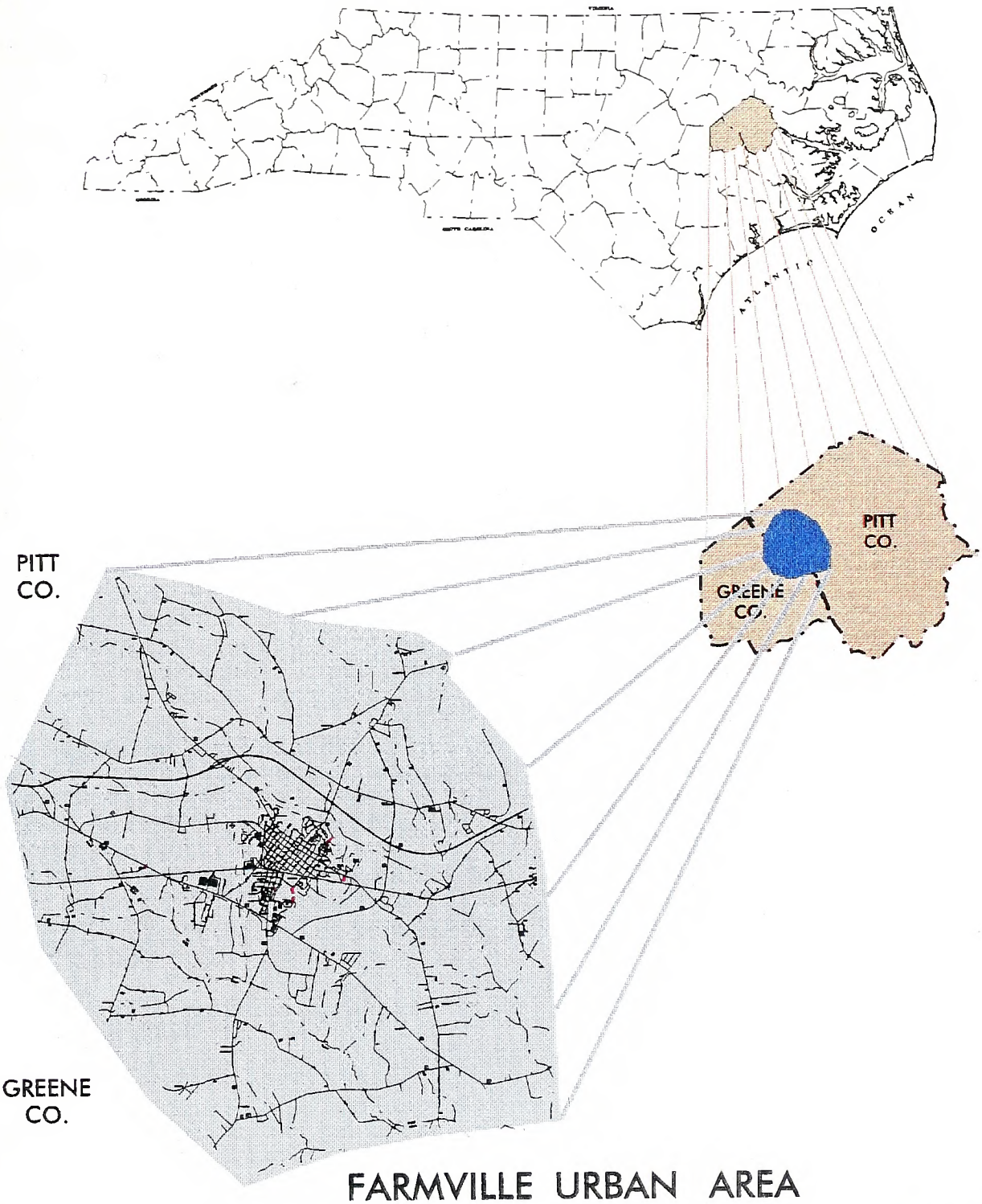


FIGURE 3

GEOGRAPHIC LOCATION MAP FOR FARMVILLE URBAN AREA



suitability. Farmville's commercial and industrial areas make up 12% of the urban area. These areas are concentrated in the central business district, along US 264 Alternate, and Fields Street.

Major Routes

The Farmville Urban Area has several major routes, US 13, US 258, and US 264. These major routes provide access to five larger urban areas, Greenville, Goldsboro, Kinston, Tarboro and Wilson. This makes Farmville very attractive to residential and industrial prospects.

US 13 runs in a northeast-southwest direction. It is located in the southern part of the planning area. Travelling northeast on this route will lead to the southern part of Greenville and travelling southwest leads to Goldsboro.

US 258 runs in a north-south direction. Travelling north from the center of the planning area will lead to Tarboro; however, travelling south will lead to Kinston.

US 264 is a newly built freeway located in the northern portion of the planning area. It runs in an east-west direction. US 264 is conveniently located with Northern Greenville just seven miles to the east and Wilson approximately twelve miles to the west.

Travel Demand

Travel Demand is generally reported in the form of average daily traffic counts. Traffic counts are taken at several locations in Farmville by the North Carolina Department of Transportation yearly to estimate future travel demands. Traffic trends over the past twenty-one years are studied and adjusted based on expected land development.

A comparison of annual growth rates from 1970 to 1991 at various count stations in Farmville showed average annual growth rates from -0.46% to 9.60%. The largest growth was on US 13/258 at the southern portion of the planning area. Typically there was a decrease in traffic at the count stations. This was due to the opening of US 264 Freeway. The main stations affected by the US 264 Freeway are US 13\258 East and SR 1200 West. Appendix A gives existing and expected average traffic volumes based on similar trends.

Traffic Safety

Traffic accident analysis is a serious and important consideration in thoroughfare plan development. 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 the physical attributes of the vehicle. This includes 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.

Traffic accident records assist in defining deficient areas in the highway system. It is a good indicator of where the highway system breaks down. Accident locations in Farmville are at or exceeding practical highway capacity. (See Chapter 4 - Deficiency Analysis. Accident patterns, revealed in accident data, are effective in the improvement decisions of a highway system. The traffic accident data received for Farmville had certain criteria. They were (1) accidents documented between January 1988 and December 1990; (2) accidents occurring a minimum of 500 feet from the intersection; and (3) a minimum of five accidents at an intersection. (See Table 3 and Figure 4)

Table 3 - Traffic Accident Profile

Intersection	No. of Accidents
US 264A & SR 1139	18
US 264A & SR 1221	15
US 264A & US 13	13
US 13 & SR 1139	12
Main Street & Wilson Street	11
US 264A & Main Street	10
SR 1221 & SR 1200	9
Main Street & Pine Street	9
Church Street & Fields Street	9
US 264A & Main Street	6
NC 121 & SR 1200	6
Contentnea Street & Wilson Street	6
Grimmersburg Street & Wilson Street	7
NC 121 & SR 1221	5
Field Street & Pine Street	5
Cotton & Main Street	5

Bridge Conditions

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or deficiency in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, and most

importantly, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons, it is imperative that bridges be constructed to the same design standards as the system of which they are a part.

Congress enacted the National Bridge Inspection Program Standards on April 27, 1971, implementing the Federal Highway Act of 1968. These standards require that "all structures defined as bridges located on any of the Federal-Aid Highway be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years."

Deficient bridges are categorized as either structurally deficient or functionally obsolete. **Structural deficiency** does not always mean that a bridge is unsafe. It usually indicates that a bridge is unable to handle the vehicle loads or speeds that would normally be expected on the highway system where the bridge is located. These limitations are then posted at the bridge approach. Structural deficiencies are particularly troublesome since they must be load posted for safety's sake. Although load posting (the imposition of a vehicle weight restriction), typically does not affect auto and light truck users, it does affect trip time and costs for other types of trucks that are required to detour in order to avoid a structurally deficient bridge.

A bridge that is **functionally obsolete** usually has inadequate width or vertical clearance for its associated highway system. In some cases, bridges are made functionally obsolete because of highway improvements on the approaches to the bridge, such as lane additions or widening of approaching roads. In other cases, bridges may be reevaluated as functionally obsolete if engineering standards have changed. Functionally obsolete bridges restrict the efficient use of the system because they act as bottlenecks.

The North Carolina DOT's Bridge Maintenance Unit, with assistance from various consultants, inspects all bridges on the State Highway System. All bridges in the Farmville Urban Area have been analyzed, rated, appraised, and inventoried, and the resulting data has been reduced to a more readily useable form as a management tool. A sufficiency index number has been calculated for each bridge to establish eligibility and priority for replacement. The bridges with the highest priority are replaced as Federal-Aid funds and State funds are made available.

The sufficiency rating is a method of evaluating deficiency factors that determine whether a bridge is sufficient to remain in service. The result of this method is a percentage in which 100 percent represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. A sufficiency rating of 50 percent or less qualifies for Federal Bridge Replacement Funds.

Farmville Urban Area has only four deficient bridges. They cross Little Contentnea Creek and Middle Swamp. The bridge located on SR 1345, a dirt road, in Greene County is the most

insufficient of the four bridges. The bridge sufficiency chart is below. (See Figure 4).

TABLE 4 -BRIDGE SUFFICIENCY CHART

COUNTY	BRIDGE NUMBER	TYPE	PERCENT RATING	LOCATION	STREAM CROSSING
Greene	30	SD	30.7	SR 1345	Middle Swamp
Pitt	65	FO	54.8	SR 1200	Little Contentnea
Pitt	79	FO	63.8	SR 1200	Little Contentnea
Greene	17	FO	65.7	US 258	Middle Swamp

SD-Structurally Deficient FO-Functionally Obsolete

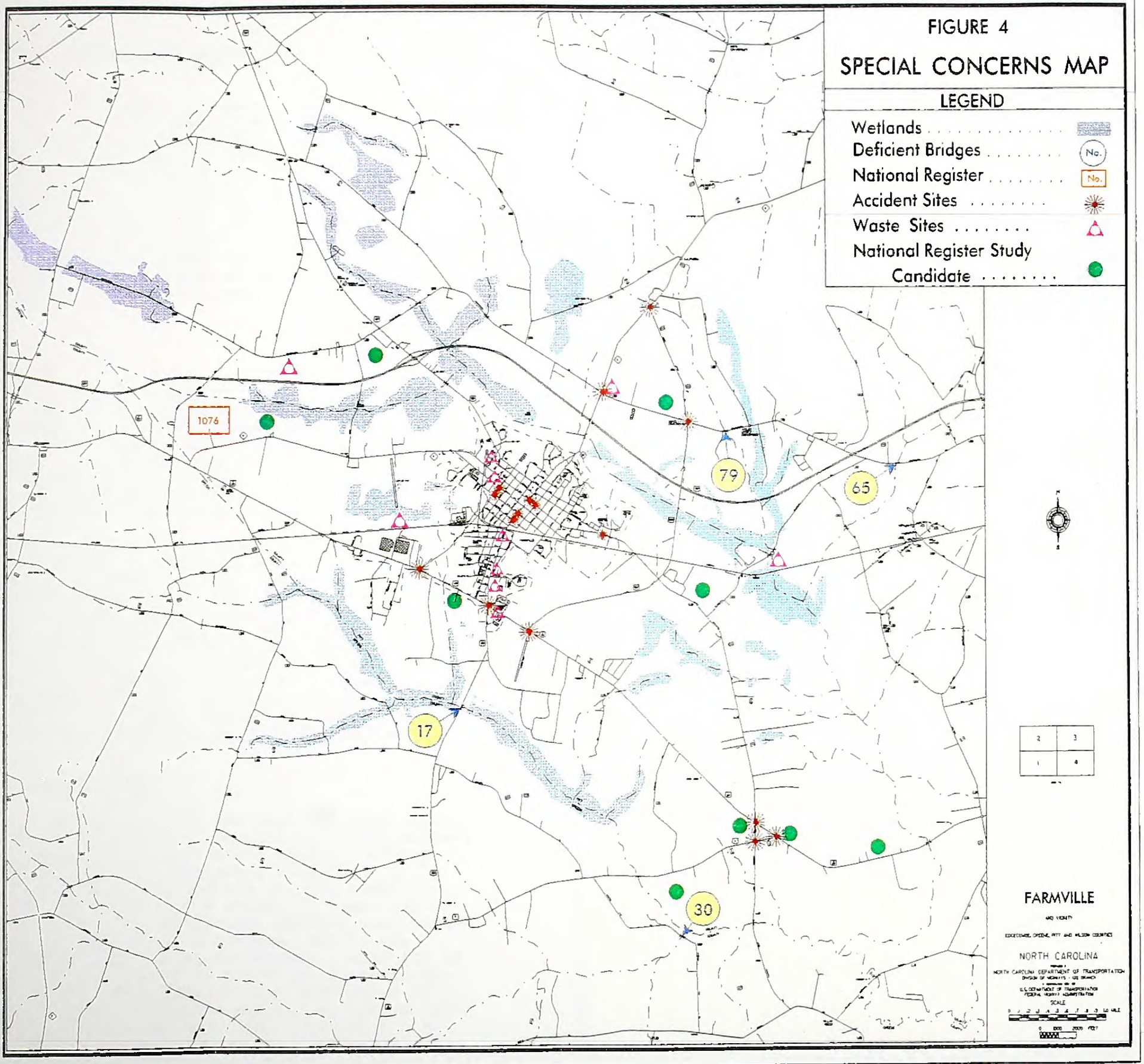


FIGURE 4
SPECIAL CONCERNS MAP
LEGEND
Wetlands
Deficient Bridges
No.
National Register
No.
Accident Sites
Waste Sites
National Register Study
Candidate
1076
79
65
17
30
FARMVILLE
NORTH CAROLINA

IV. DEFICIENCY ANALYSIS

This chapter presents an analysis of the ability of the existing road network to serve the area's travel desires as the area continues to grow. The essence of transportation planning is the ability to test and analyze different highway configurations for their efficiency in serving the area as it grows. Care and emphasis is placed, not only on detecting the major deficiencies, but on understanding their cause. Travel deficiencies may be localized. It may also be the result of inadequate pavement width; substandard highway design; inadequate intersection controls; an uncharacteristic peak travel demand; or some combination thereof. The underlying problem may be caused by a system deficiency such as a need for a bypass, loop facility, or additional radial service.

EXISTING ROAD NETWORK

Farmville's road network in the central area is characterized by a gridiron pattern. The remaining areas are served by radial streets which provide traffic movement from the outlying areas to the central area. The radial streets are US 258, NC 121, and SR 1139. The majority of the traffic from these radials cross in the CBD at the intersection of Wilson Street and Main Street. This causes congestion problems and the quickly decreasing practical capacity on these and surrounding streets.

The radial streets do not carry an overwhelming amount of through traffic. Farmville has a considerable amount of internally generated traffic. To enter the Farmville central area from the south there are only two routes, US 258 and Fields Street (US 258 Truck Route). To enter the Farmville central area from the north there are also only two routes, US 258 and NC 121. Traffic from the US 264 Freeway flow into the central area from the north side on US 258 and from the east side on SR 1139. A loop system is practically nonexistent. There is a segment connecting a pair of radials, but it is not continuous. It is SR 1221 with US 264 Freeway. Therefore mostly no intra-area circulation is allowed without being routed through downtown.

1991 TRAVEL ON EXISTING ROAD NETWORK

A good indication of the adequacy of the existing road network is a comparison of traffic volumes with the ability of the streets to move traffic. In an urban area, a street's ability to move traffic is generally controlled by the spacing of major intersections, the width of pavement, and the traffic control devices utilized. Thus, the ability of a street to move traffic can be increased to some degree by restricting parking and turning movements; using proper sign and signals 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. The relationship of

traffic volumes to the capacity of the roadway will determine the level of service being provided. Six levels of service have been selected to identify the conditions existing under various speed and volume conditions on any highway or street (See Appendix D). The level of service usually suitable for urban design practice is level of service C and is defined as being in the zone of stable flow with most drivers restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is attained at this level of service. However, a level of service D is tolerated on an existing facility before it is considered operating over its "practical" capacity. (See Table 6).

TABLE 5 - PRACTICAL CAPACITY* FOR URBAN FACILITIES

HIGHWAY TYPE	TRAVEL LANES	VEHICLES PER DAY
Urban Arterial	2	8,000-12,000
Urban Arterial	3**	12,000-16,000
Urban Arterial	4	18,000-22,000
Urban Arterial	5**	24,000-28,000

*Level of Service D
**Center Turn

When streets are operating below level of service D, speeds are well below the speed limit and travel times are increased. In addition, Maneuverability is severely limited and a driver's frustration level is generally much higher. This leads to driver's taking more chances on left turns and the distance between vehicles is severely diminished. Both of these factors result in additional accidents. The roads with traffic accident profiles are also the ones at or exceeding practical capacity. (See Table 3).

Figure 5 & 7 shows the Existing Road Network with the 1991, 2015, and 2020 ADT's; and the Existing Road Network with 1991 Practical Capacities. The most significant problem areas in 1991 were:

US 13 -- This route exceeds its practical capacity at the southern planning boundary to the US 258 split. It functions nearing its practical capacity where US 264A merges into US 13 to the eastern planning boundary.

US 258 -- It functions nearing its practical capacity from SR 1347 in Greene County to US 264A.

US 264 Alternate -- This 1,600 feet section from near the shopping center to SR 1221 drops from a four lane road to a two lane road and has a signal at SR 1221. Traffic has to

condense itself and slow for the signal. Therefore, it exceeds its practical capacity.

SR 1139 -- It functions nearing its practical capacity from SR 1221 intersection to the Northern-Southern Railroad approaching the school zone.

SR 1221 -- It functions nearing its practical capacity from SR 1139 intersection to the US 264 Freeway.

Main Street -- Likewise, most traffic flowing from one part of Farmville to the other will ultimately be in contact with Main Street. It exceeds its practical capacity in the CBD area and at the intersection of US 264A to Thorne Street. It is functioning near its practical capacity from the CBD area to Thorne Street near the US 264A intersection; and from Wilson Street to Belcher Street.

Fields Street -- This is the major route employees travel to reach the industrial district on US 264A. It is also one of the streets for the US 258 Truck Route. Trucks are plentiful in this area with three percent multi-axle trucks on this corridor. It exceeds practical capacity from the intersection of US 264A to near the Northern-Southern Railroad. It is functioning near its practical capacity from Wilson Street to Pine Street.

Wilson Street -- Most traffic flowing from one part of Farmville to the other will ultimately be in contact with Wilson Street. It exceeds its practical capacity. It is the main east-west thoroughfare and all of the radial streets drain onto Wilson Street.

2020 TRAVEL ON THE EXISTING ROAD NETWORK

Farmville's existing road network already has several deficient areas as indicated by the effects of 1991 Travel on the existing road network. (See Figure 7) Given approximately three decades of traffic growth, congested travel will not stand still. Travel pressure on streets which already experience problems will escalate, as the area continues to grow. Figure 6 & 8 shows the Future Road Network with the 1991, 2015, and 2020 ADT's; and the Existing Road Network with 2020 Practical Capacities.

Problems are created by the radial system funnelling traffic towards downtown and internally generated traffic. As congestion in this area continues, travellers wishing to visit the area will gradually decrease as will economic prosperity. However once congestion is removed, shoppers will continue to frequent Farmville's downtown area.

THE DO-NOTHING ALTERNATIVE

During the development of a thoroughfare plan, changes to the existing road network is only one of the methods that are considered to relieve congestion and make the road network operate

more efficiently. Alternate means of transportation considered with a do-nothing alternate must also be considered in order for the plan to be complete. In addition, to assure that the plan will be as complete as possible, the future year projections considers normal growth in housing as well as major shifts in land use that are known of at the time.

An alternative to any proposed improvement is a "do-nothing" concept. Under this concept, no improvements would be made to existing streets, and no new facilities would be constructed. Some of the major advantages of doing nothing include:

1. No capital investment cost.
2. No construction traffic disruption.
3. No noise, air or water pollution due to construction.
4. No removal of shrubs or trees.
5. No additional land acquisition.
6. No displacement of people or businesses as a result of construction.

There are, however, several disadvantages to a "do nothing" policy which have significant adverse impacts on the urban environment. These include:

1. Increasing traffic volumes and congestion on major streets, which will cause traffic to divert to residential streets.
2. Existing "bottleneck" situations will become worse.
3. Social, health, and safety standards will deteriorate.
4. Increased road user costs.
5. Increased driving time.
6. Increased accidents.
7. Increased air and noise pollution induced by traffic congestion.
8. Reduced mobility for emergency vehicles.
9. Increased transportation costs for businesses.
10. Reduced retail sales as a result of increased congestion, reduced accessibility, and higher transportation costs.
11. Increased driver and public frustration due to congestion.

The "do-nothing" concept, while an alternative, is not a viable alternative actively encouraged by most planners in light of the consequences just identified.

2020 TRAVEL ON THE EXISTING THOROUGHFARE PLAN

Farmville has two previous thoroughfare plans, 1970 and 1979, and one revision in 1981. Figure B1 shows the 1979 Thoroughfare Plan. The essential elements of the 1979 Farmville Plan are:

* The US 258 Bypass extending from near SR 1200 to Middle Swamp Creek crossing at US 258 South.

* The loop completion, SR 1221, extending from US 264A to US 258.

* US 258 Truck Route Connector extending from Turnage Street to Fields Street.

* Extending existing Pitt Street on the north and south sides to create another north-south crosstown thoroughfare.

* Extending existing Vines Street on the east and west sides to promote development.

* Fields Street north and east extension to provide additional access to the schools.

In essence, the 1979 Plan, if it were implemented, would be adequate in meeting most of the transportation needs for the future. However, current development trends and design standards warrant a complete reevaluation of all the elements in the 1979 Plan.

DEVELOPMENT OF THE THOROUGHFARE PLAN

There are many steps in the development of a thoroughfare plan. There are also many people involved with its development. After an abundance of data is collected and deficiencies in the highway system are determined; a solution must be decided upon. The solution is worked out through a series of meetings with the local government, citizens, and NCDOT. This section presents the sequence of meetings leading to the adoption of the Farmville Urban Area Thoroughfare Plan by the Town of Farmville.

1) July 21, 1992 --- Meeting with Farmville Planning Board

Farmville's growth areas, land use, population, and capacity deficiencies were discussed at this meeting. Several improvements sketched on a rough draft map dated July 21, 1992 resulting from model analysis and the earlier plan were discussed. However the major change in improvements compared to the 1979 Thoroughfare Plan was the US 258 Bypass. US 258 Bypass did not cross US 264 Freeway; it moved closer to the Town Limits; and it merged into Fields Street with Fields Street creating an intersection with the Bypass about 1000 feet away from US 264 Alternate. Crossing US 264 Freeway would mean placing an interchange less than one mile away from another interchange. AASHTO's Policy on Geometric Design states as a general rule, minimum interchange spacing in rural area should be two miles. However, spacing is mostly determined by weaving volumes, ability to sign, and required lengths of speed change lanes. Bringing US 258 Bypass closer to the Town limits serves Farmville internal traffic better and works better in conjunction with its industrial areas. Furthermore, an extra signalized intersection on US 264 Alternate is alleviated when US 258 Bypass is merged into Fields Street.

Board Concerns:

US 258 Bypass merging into Fields Street causing intersection congestion.

Intersection backing up onto Fields Street where it intersects with new US 258 Bypass.

Result:

Production of Farmville Urban Area Preliminary Recommended Thoroughfare Plan for next meeting. (See Figure 9)

2) August 18, 1992 --- Meeting with Farmville Planning Board

The Farmville Urban Area Preliminary Recommended Thoroughfare Plan dated August 17, 1992 was presented. The function of each proposed thoroughfare, the proposed design of each thoroughfare, its relationship to the system, how it relieves the existing system and how they coordinate with Farmville's future transportation goals were discussed. Another concept evaluated was extending SR 1302 in Greene County to the proposed US 258 Bypass.

Board Concerns:

Intersection spacing on Proposed US 258 Bypass and Fields Street and probable congestion

Providing another east-west passageway to supplement Wilson Street

Result:

Extension of Church Street to provide another east-west passageway

Presentation of Preliminary Recommended Plan to Town Citizens in a Public Forum and to Town Council at next meeting

3) August 26, 1992 --- Public Forum with Local Citizens

The Public Forum is an informal afternoon drop-in session for any interested parties to view the Preliminary Plan and ask questions. The Farmville Urban Area Preliminary Recommended Plan dated August 18, 1992 was presented. Some questions asked were: What is the purpose of a Thoroughfare Plan? and Where is my Property?

Public Concern:

Location of the US 258 Bypass causing congestion at intersection of US 264 Alternate

Interchange for US 258 on US 264 Freeway

Result:

Ideas, comments, and concerns were taken to Town Council meeting that evening

4) August 26, 1992 --- Farmville Town Council Meeting with Planning Board present

Farmville's growth areas, land use, population, environmental concerns and capacity deficiencies were presented. The Farmville Urban Area Preliminary Recommended Thoroughfare Plan dated August 18, 1992 was presented and each proposed thoroughfare discussed.

Council Concerns:

Movement of US 258 Bypass a little further outward to avoid adding more traffic to Fields Street

Result:

Analyze US 258 Alternate #2 through model simulation to see if it will provide the same service as Alternate #1 (See Figure 10)

5) September 15, 1992 --- Meeting with Farmville Planning Board

US 258 Bypass Alternate #1 and Alternate #2 were discussed. The analysis found that either alternate would provide the service anticipated from the proposed Bypass, although each has its pros and cons.

Result:

The Farmville Planning Board voted in majority in favor of the Farmville Urban Area Preliminary Recommended Thoroughfare Plan dated September 15, 1992 with Alternate #2 and recommended it to the Farmville Town Council.

6) October 6, 1992 --- Public Hearing on Thoroughfare Plan

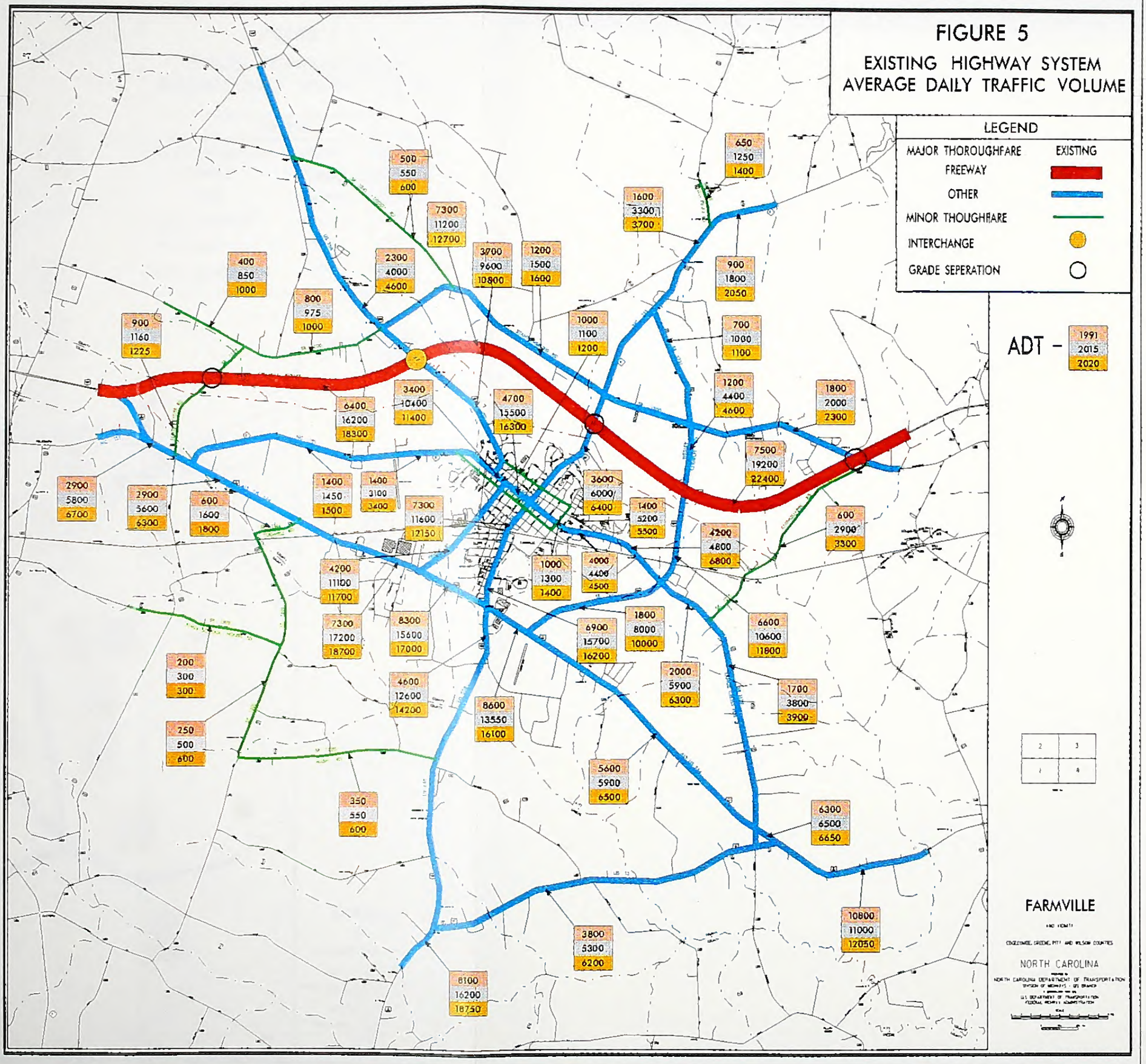
Now the Farmville Urban Area Recommended Thoroughfare Plan dated September 15, 1992 was presented to the Town Council. The comparison of both Alternates were presented and comments from the public were invited.

Result:

Since there was no opposition towards the Thoroughfare Plan the Farmville Town Council adopted the Farmville Urban Area Recommended Thoroughfare Plan dated September 15, 1992.

FIGURE 5

EXISTING HIGHWAY SYSTEM AVERAGE DAILY TRAFFIC VOLUME



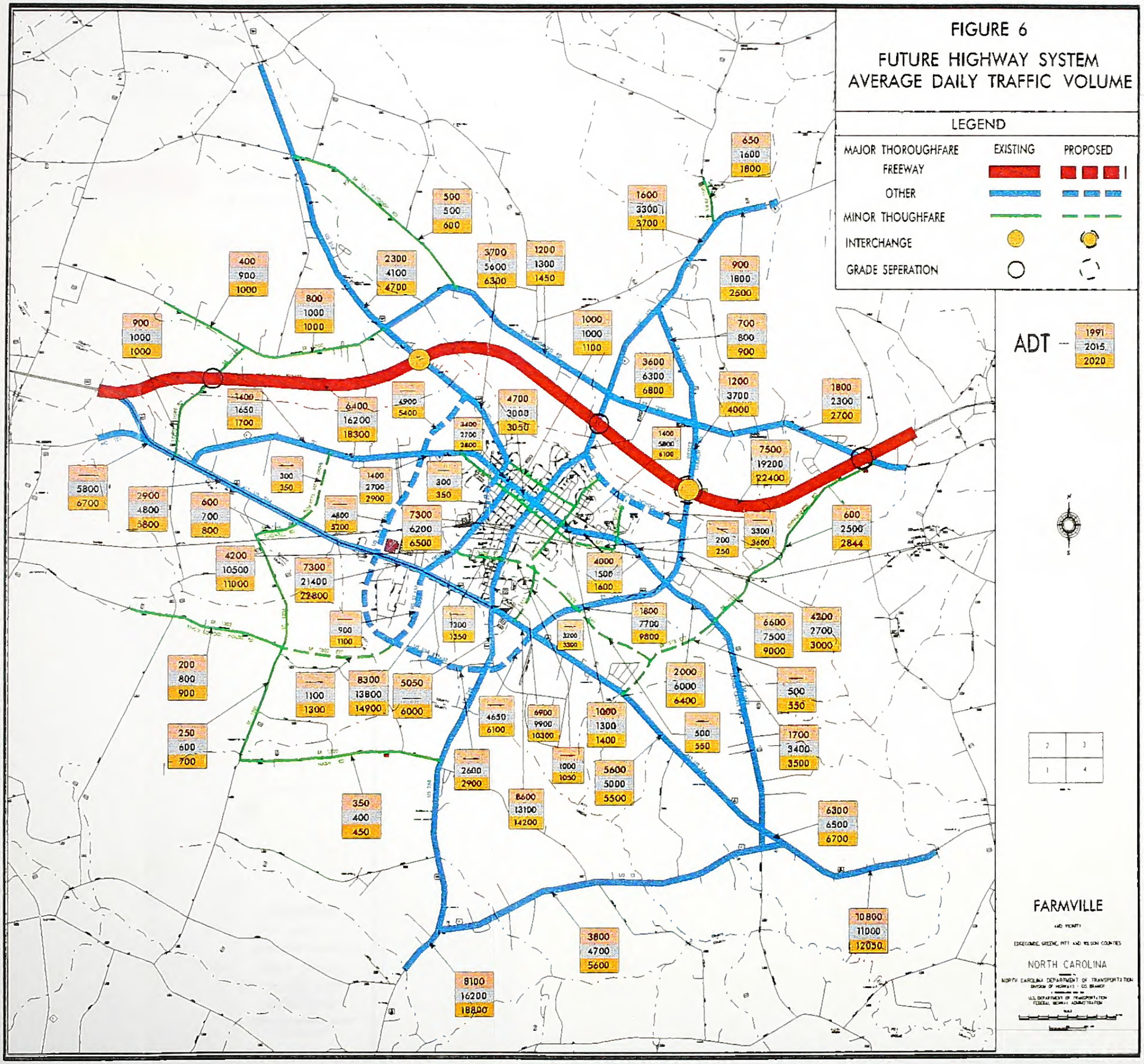


FIGURE 6
FUTURE HIGHWAY SYSTEM
AVERAGE DAILY TRAFFIC VOLUME
LEGEND
MAJOR THOROUGHFARE
EXISTING
PROPOSED
FREEWAY
OTHER
MINOR THOUGHFARE
INTERCHANGE
GRADE SEPERATION
ADT
1991
2015
2020
FARMVILLE
NORTH CAROLINA

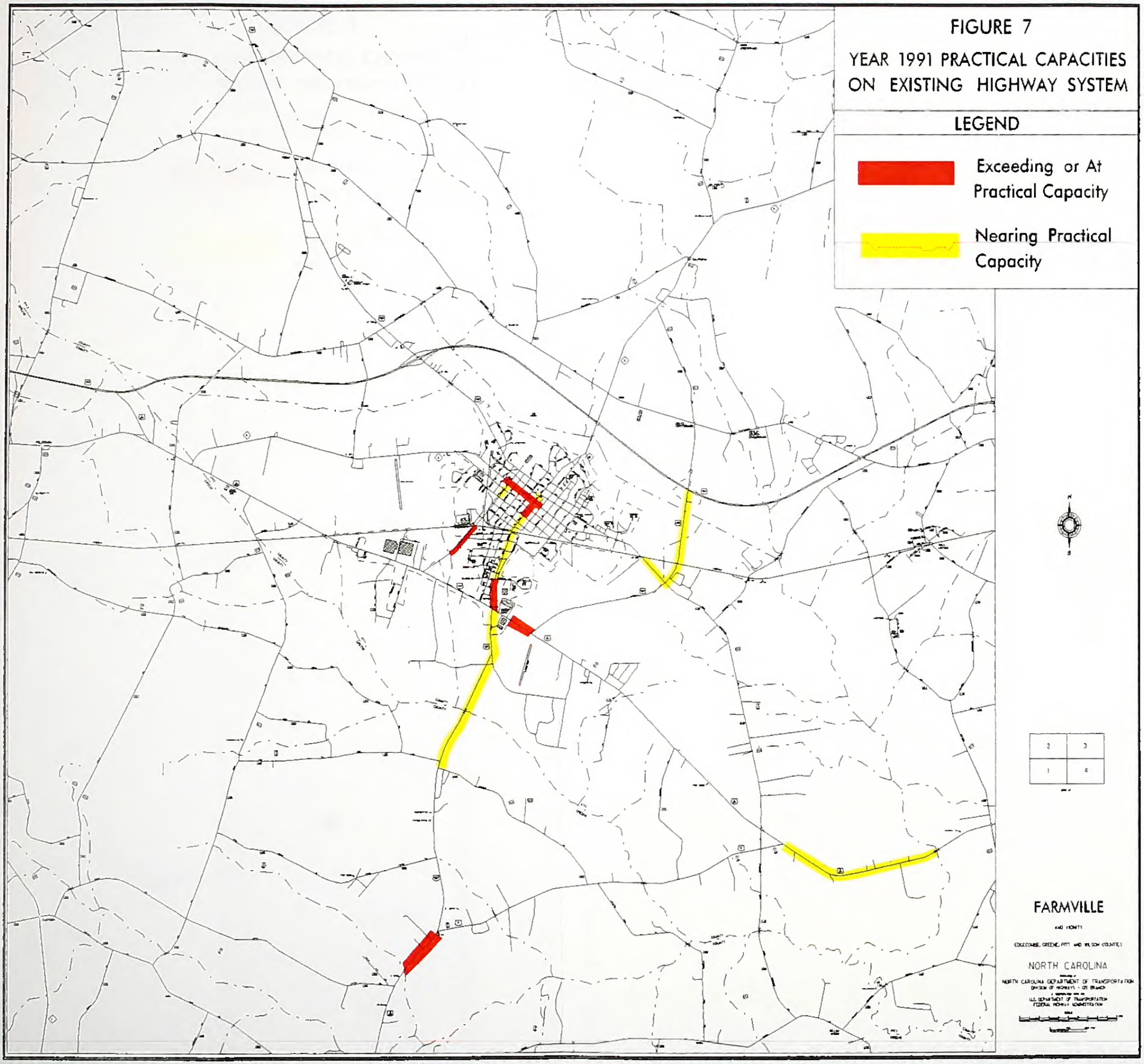


FIGURE 7
YEAR 1991 PRACTICAL CAPACITIES
ON EXISTING HIGHWAY SYSTEM
LEGEND
Exceeding or At
Practical Capacity
Nearing Practical
Capacity
FARMVILLE
NORTH CAROLINA

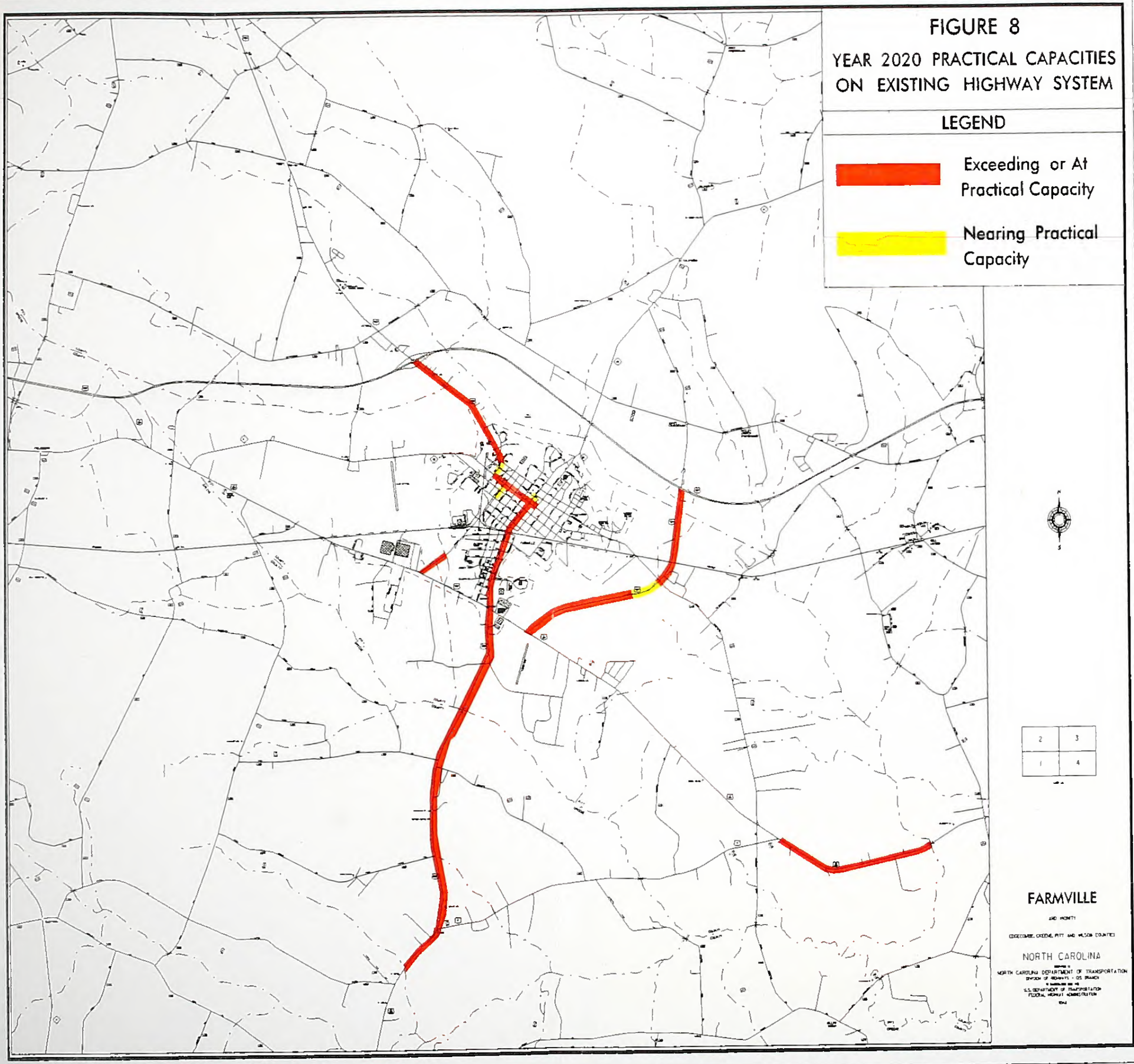


FIGURE 8
YEAR 2020 PRACTICAL CAPACITIES
ON EXISTING HIGHWAY SYSTEM
LEGEND
Exceeding or At Practical Capacity
Nearing Practical Capacity
FARMVILLE
NORTH CAROLINA

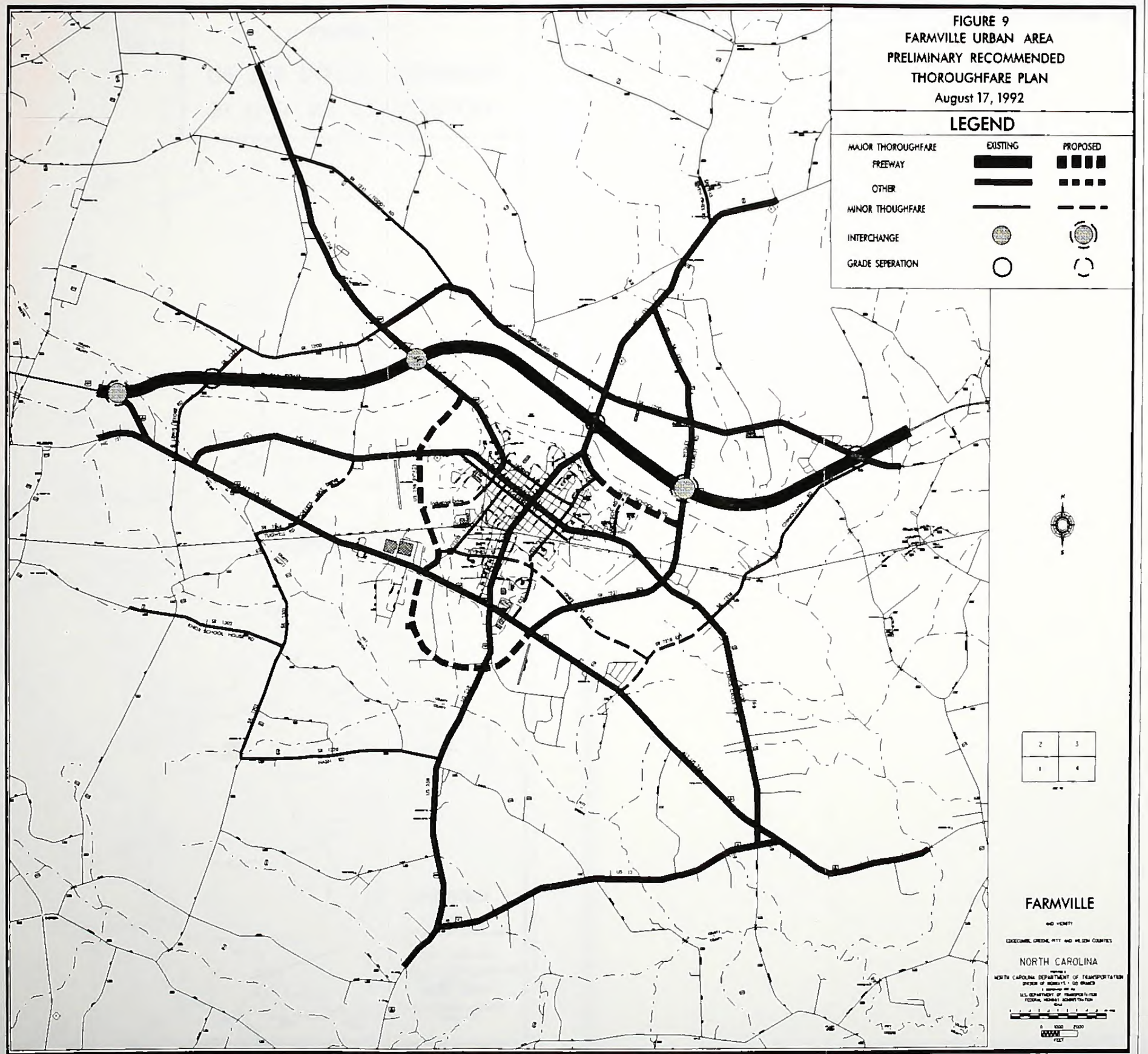
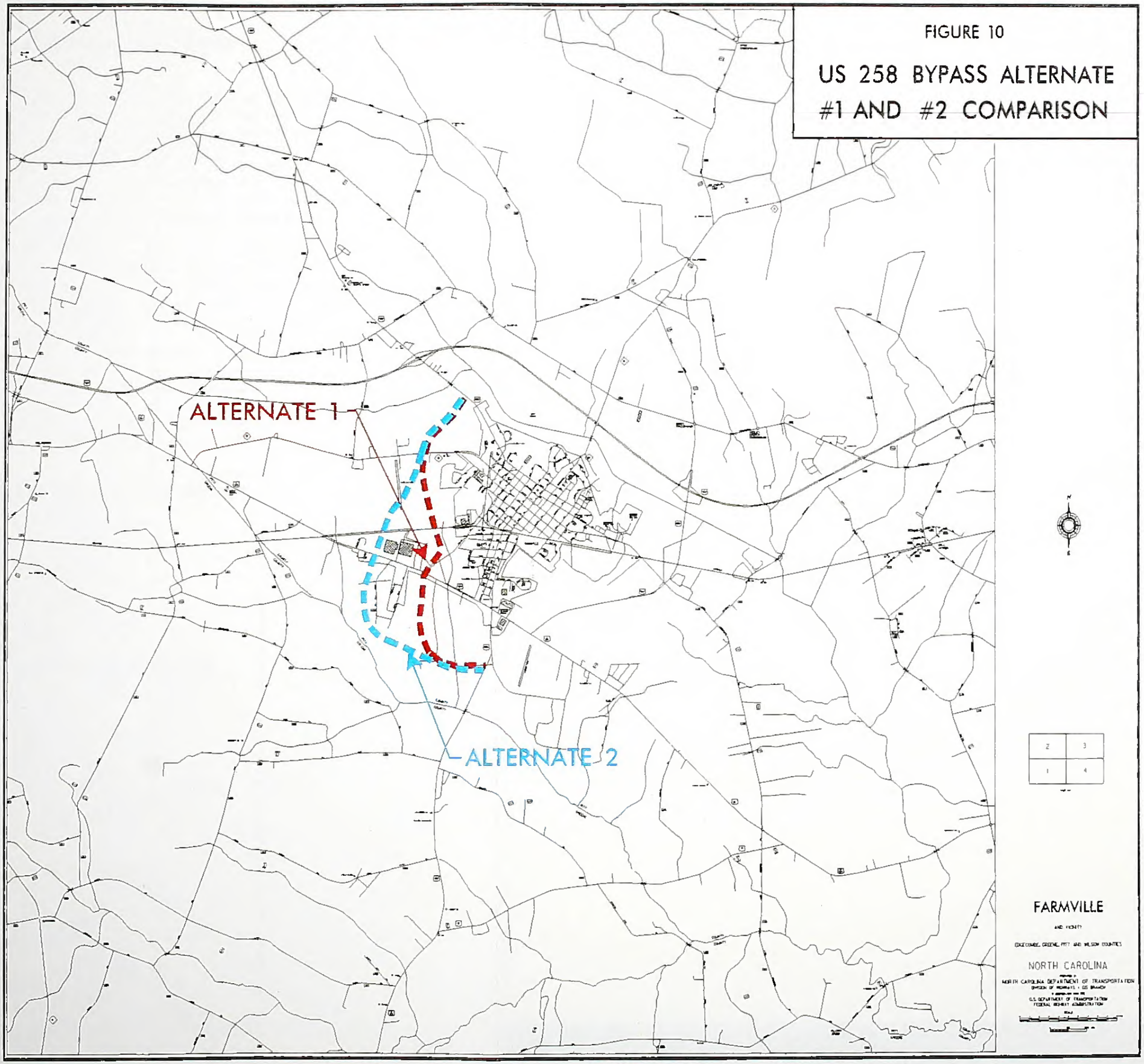


FIGURE 9
FARMVILLE URBAN AREA
PRELIMINARY RECOMMENDED
THOROUGHFARE PLAN
August 17, 1992
LEGEND
MAJOR THOROUGHFARE
EXISTING
PROPOSED
FREEWAY
OTHER
MINOR THOUGHFARE
INTERCHANGE
GRADE SEPERATION
FARMVILLE
AND VICINITY
NORTH CAROLINA

FIGURE 10

US 258 BYPASS ALTERNATE #1 AND #2 COMPARISON



V. ENVIRONMENTAL CONCERNS

Thoroughfare Planning is the planning of highway systems. It is also the initial stage of a road being constructed. Environmental factors have been a consideration in planning by North Carolina since 1959. The environmental factors are (1) physical environment; (2) social and cultural environment; and (3) economic environment. (See Table 6) . Environmental considerations in planning include (1) identifying critical environmental factors; (2) developing alternatives based on environmental factors; (3) evaluating alternatives relative to travel service and environmental factors; and (4) developing a recommended thoroughfare plan that best meets environmental, travel service and other public goals. Even before evaluating alternatives certain environmental data is gathered; for instance, wetlands inventory , historic landmarks, economic development, etc. Early research into environmental factors is general. However, recommendations given in a thoroughfare plan will more likely remain intact if environmental factors are researched. Early research highlights the area's need for further investigation on projects. Each category is discussed in more detail. Special Concerns Map-Figure 4 shows environmental factors which effect the Plan. Figure 11 shows the Thoroughfare Plan.

TABLE 6-ENVIRONMENTAL CONSIDERATIONS

Physical Environment

Air Quality
Water Quality
Wetlands
Soils and Geology
Wildlife and Vegetation

Social and Cultural Environment

Housing and Neighborhoods
Noise
Educational Facilities
Churches
Historic Landmarks
Parks and Recreational Facilities
Public Health and Safety
National Defense
Aesthetics

Economic Environment

Businesses
Employment
Economic Development
Public Utilities
Transportation Costs
Capital Costs
Operation and Maintenance Costs

PHYSICAL ENVIRONMENTAL FACTORS

Air Quality

Air quality has been a continuous main concern since the Federal Air Pollution Control Act of 1955. This concern still continues with the signing of the Clean Air Act in 1970 and its amendments in 1977 and recently in 1990. Although Congress had passed three previous Acts, the Clean Air Act of 1970 was the most substantial because it set standards. The Federal Government has set more stringent standards on mobile source emissions through the amendment of 1990. The CAAA of 1990 adds to the process of transportation planning with transportation related provisions. These provisions are greater integration of the transportation and air quality planning processes; expanded requirements for determining conformity of transportation plans, programs, and projects; expanded use of highway sanctions; and a renewed emphasis on controlling growth in vehicle-miles-travelled (VMT) and on reducing congestion levels in certain nonattainment areas. In addition, the Intermodal Surface Transportation Efficiency Act of 1991 states further integration between State and urban area transportation planning is needed for conformity with the CAAA.

Nonattainment areas are areas where mobile source emissions exceed benchmark levels. These areas must meet deadlines in reducing and maintaining standard emission levels. Although Federal law focuses on nonattainment areas, the attainment areas are also very important. The law focuses on keeping them as such. Therefore, the design of a thoroughfare system has a significant effect on the amount of emissions added to the atmosphere. Emissions are reduced wherever traffic is permitted to flow smoothly, or by the reduction of congestion and stop-and-go driving conditions. The reduction of emissions level is created by the more efficient use of fuel offered by free flow conditions.

The layout of the road network has an effect on air quality. A street system that provides easy and direct movement between all sections of the city reduces travel time and distances, subsequently reducing pollutant emissions. VMT in the Plan increases 1.2% in comparison to the existing road network with future travel. However the VHT's decrease. (See Table 7) Farmville'sThoroughfare Plan not only provides free flowing traffic for reduction of emissions in its congested areas; it is a Plan which promotes economic development. This is accounted for by the increase in VMT. Although VMT does increase a little, long range future travel will benefit from this well developed plan, once Farmville becomes the suburbs of Greenville, like Cary is to Raleigh, NC.

TABLE 7 - AIR QUALITY ANALYSIS

TRAVEL YEAR	SYSTEM	VMT	VHT	EMISSIONS HC	CO	NO
1991	Existing	426,280	10,670	2,298	24,646	2,931
2020	Existing	594,560	17,770	1,797	20,546	2,672
2020	Plan	601,730	13,280	1,570	16,107	2,780

Water Quality

Water Quality is a prime asset and every effort should be made during highway construction to adhere to recommended guidelines to prevent contamination. Guidelines for maintaining water quality include: (1) control of soil erosion and siltation; (2) control of waste disposal areas during construction; (3) allowing entrance of live and impounded waters only within construction limits; (4) no deposition of any construction materials or pollution agents in traversed waters; (5) proper drainage of all borrow pits and ditches; and (6) inclusion of adequate drainage control plans on facilities in construction. These guidelines are set in NCDOT's "Best Management Practices for Protection of Surface Waters".

Although the Town of Farmville receives its water supply from elevated tanks and ground wells, guidelines for maintaining water quality is still expected. Most of the surface water and storm drainage is into the Little Contentnea Creek Basin which flows into the Neuse River. Most of the surface water and storm drainage is into the Little Contentnea Creek Basin which flows into the Neuse River. The water quality classification of Little Contentnea Creek is Class C-SW-NSW. The classification means the water is used for fishing and secondary recreation; it is of **SW**amp type; and it is **N**utrient **S**ensitive **W**aters. Nutrient sensitive waters have farmland chemical runoff. One proposed project, Knox Schoolhouse Road, will cross this creek at Middle Swamp. In addition, the Three Schools Boulevard will border the floodway of Little Contentnea Creek.

Another concern to water quality is waste sites. Waste sites are waste from leaking underground tanks and sewage disposal. There are different categories of waste sites. Farmville has a total of eleven wastes sites with three different categories. (See Figure 4). A description of the three categories which Farmville has are as follows: 1) Superfund Sites are critical. It is major hazardous waste from leaking underground tanks. 2) Groundwater Incidents are also leaking underground tanks. However they are not as critical as Superfund sites. 3) National Pollution Discharge Elimination Systems, NPDES, are sewage discharge outfalls from some type of industry.

Wetlands

Wetlands are very important in evaluating alternatives. Wetlands are lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The Wetlands Memorandum of Agreement Section 404 of the Clean Water Act of 1977 gives guidance on this environmental factor. The primary goal of the memorandum is to achieve no net loss of wetlands. Also, no disruption of wetlands is permitted; if there is a practical and feasible alternative that would have less adverse impact on the area. In addition, compensatory mitigation is required if wetlands are impacted. Wetlands impacted in the Farmville Urban Area Thoroughfare Plan are in Table 8. Every effort was made to minimize wetland areas as well

as undisturbed habitats. Whenever wetland had to be impacted, the smallest area possible was taken. Figure 4 shows the Wetlands Inventory for Farmville.

TABLE 8

WETLANDS IN RELATION TO PROPOSED THOROUGHFARE PLAN

THOROUGHFARE	ACREAGE	TYPE OF WETLAND
US 258	7.0	PFO1A PFO1C PSS3C PFO4Bd PFO1A
Three Schools Blvd	2.0	PFO1C PSS3C
SR 1302 Ext.	2.0	PFO1A PFO1C
Vines Street Ext.	1.0	PFO4B PF01B
SR 1218 Ext.	2.0	PFO1A

P - Palustrive - vegetated wetlands (marsh, swamp)
FO - Forested - dominated by large trees > 6m tall
SS - Scrub-Scrub - dominated by small trees < 6m tall

1 - Broad-leaved/Deciduous
3 - Broad-leaved/Evergreen
4 - Needle-leaved/Evergreen

Water Regime
Non-Tidal

A - Temporarily Flooded
B - Saturated
C - Seasonally Flooded

Soils and Geology

Soils and Geology influence highway construction. Subsurface soil, compaction, and stability are important soil conditions because flexible pavements in highway construction is used. The Farmville planning area has two main soils type. They are Norfolk-Goldsboro and Lynchburg-Rains associations. The Norfolk-Goldsboro association consists of moderately well drained to well drained soils that have a subsoil of dominantly brittle sandy clay loam and/or clay loam. On the other hand, the Lynchburg-Rains association consists of moderately well drained to poorly drained soils that have a subsoil of dominantly brittle

sandy clay loam. Nevertheless, these associations make up the most fertile and productive farmland in the world, of which Farmville gets its name. Soil stabilization and artificial drainage is recommended in areas of poor drainage.

Farmville's geologic system consists of thin layers of clays, sands, and gravel which overlay sediments of the Miocene, Eocene, Parleocrene and Cretaceous ages. This geological system provides a solid and stable subsoil foundation.

Wildlife and Vegetation

Wildlife and Vegetation is in abundance in the Planning area. Following is a list of some of the wildlife and habitats:

Wildlife:	Dove	Deer
	Quail	Squirrel
	Rabbit	Raccoon
	Duck	
Habitats:	Fescue	Sedge
	Shrub Lespedeza	Oak
	Pokeweed	Dogwood
	Ragweed	Pines

There is only one species listed as Special Concern in the Endangered and Threatened Plants and Animals of North Carolina. This species is called the Neuse River Water Dog, a fish. There are no thoroughfares near the site of the species. However, the area where Knox Schoolhouse Road crosses the Middle Swamp should be evaluated further due to the creeks being upstream of the Neuse River.

SOCIAL AND CULTURAL ENVIRONMENT

Housing and Neighborhoods

The preservation of pleasant cohesive neighborhoods is a fundamental criteria of thoroughfare planning and an important goal for Farmville. By designating certain streets as thoroughfares, heavy traffic is kept off neighborhood streets, and the negative impacts of traffic are segregated as much as possible from residential environment. Maintaining these conditions, as population and travel grows, requires improvements and expansion of the thoroughfare. The proposed Three Schools Boulevard is designed to do just that. It will reduce traffic on the residential streets and carry the heavier traffic.

Little disruption is expected to existing neighborhoods. In fact, much of the proposed construction is outside the developed area of Farmville. However, implementation of the thoroughfare plan is expected to dislocate about five families. These

dislocations will be due to the US 258 Bypass. More importantly US 258 Bypass north of US 264A anticipates residential growth. **Thus, it is important that this corridor be protected to minimize the risk of other families becoming dislocated.**

Noise

The noise level of most streets will probably increase some during the design period with adverse conditions in those areas where congestion exists or a facility is functionally misused. It is an objective of thoroughfare planning to reduce congestion and functional misuse. Thus, at the same time it reduces noise levels in sensitive areas. Some noise sensitive areas exist near schools, churches, hospitals, and quiet neighborhoods.

Noise levels created by highway improvements are taken into consideration in today's highway design process. Research is providing techniques to predict the noise levels created by highway improvements and offering measures to reduce noise levels.

Farmville is not expected to have increases in noise levels in the development areas during the planning period. This is due to much of Farmville's Thoroughfare Plan diverting traffic from the downtown area.

Educational Facilities

Farmville's school system is unique. All four schools are located in Farmville. This factor promotes much parental and community interest and involvement in educating their children.

No schools will be displaced by the thoroughfare plan. However, the schools will be affected in a positive sense. The thoroughfare plan relieves congestion and operational problems in the school zone at East Grimmersburg Street and on the downtown streets.

Churches

No churches are affected by the thoroughfare plan.

Historic Landmarks

Architectural

The Town of Farmville, before its incorporation, has always been a flourishing town. It was developed 200 years, before its incorporation in 1872 as New Town, by early pioneer settlers. It was later changed to Farmville because of the areas prospering farming industry.

Today Farmville is an excellent example of how its earlier inhabitants lived. Throughout Farmville and beyond are historic architecture of the late 1800's and early 1900's. The Benjamin

May-Lewis House is the only home listed with the National Register of Historic Places. However, there are several others on the study list. No proposed thoroughfares will affect any existing or on study National Register participants. (See Figure 4).

Archaeological

Archaeological Sites are similar in significance to park and recreational facilities and architectural sites. However, archaeological sites can be excavated, evaluated, information and data extracted, and then used for transportation purposes. Archaeological sites are difficult to identify during the planning process due to lack of information. Therefore all thoroughfares should be evaluated individually before construction. Areas which have already undergone evaluation will give perception into the nature of its surroundings.

Farmville was populated with Tuscaroras Indians centuries before the early pioneer settlers. Evidence can be found throughout the planning area. Some were discovered through the surveys of the Little Contentnea Creek Watershed and the old Waste Treatment Facility.

Some of the items found were quartz waste flakes, fire cracked rock, slate, side-notched projectile point, miscellaneous lithics, grit-tempered potsherds, Fluted Point, Savannah River point fragment, hammerstone, scraper, Morrow Mountain point, and parts of a Halifax point. The time period of these items range from 10,000 BC to 1650 AD. (See time period chart).

TIME PERIODS

Paleo Indian:	10,000 - 8000 BC
Early Archaic:	8000 - 5000 BC
Middle Archaic:	5000 - 3000 BC
Late Archaic:	3000 - 1000 BC
Woodland:	1000 BC - 1650 AD

Parks and Recreational Facilities

Farmville has a couple of parks, the Monk Park and the Bennett Park. No parks are affected by the thoroughfare plan.

Public Health and Safety

The thoroughfare plan contributes to the public health and safety through (1) reduction in traffic accidents; (2) improved service to medical facilities; (3) improved mobility for fire, police and other emergency vehicles; and (4) enhanced air quality.

Implementation of the thoroughfare plan will provide greater mobility of public vehicles at Belcher Street and US 258 and also Belcher Street and Main Street. The proposed US 258 Truck Route Connector provides a faster way for public vehicles to reach the

southwest quadrant of the planning area. Whereas Three Schools Boulevard provides a faster and safer route to Pitt County Memorial Hospital and East Carolina University Medical Center.

National Defense

A national defense highway serves transportation demands during periods of national or local emergency such as war and natural calamity. US 264 Freeway is designated as Section 165 of the National Defense Highway System.

Aesthetics

Aesthetics is important in a thoroughfare plan. The plan should be appealing to the public and contribute to an improved urban environment. Modern landscape methods should be used to make highway improvements compatible with the surroundings.

ECONOMIC ENVIRONMENT

Businesses

The development of a thoroughfare plan has both positive and negative effects on business within the area. As new thoroughfares are constructed, or old ones widened, the improved mobility tends to improve the overall business climate and proves more attractive to the establishment of new business interests. The construction of new facilities often opens up new land areas for business expansion. On the negative side is the potential disruption or removal of existing businesses as a result of thoroughfare construction.

Every effect was made to avoid disrupting businesses. However, one business will be impacted at NC 121 due to Three Schools Boulevard.

Employment

Improvement in the level of service provided by the thoroughfare system will reduce transportation costs for industry, facilitate industrial employment expansion, and contribute to area income through additional business activity and reduced transportation cost for workers. An adequate thoroughfare plan will improve the future economic vitality of Farmville. NCDOT has worked cooperatively with the Town of Farmville to develop a Thoroughfare Plan that is compatible with the Town of Farmville's Industrial Park Plans.

Economic Development

New thoroughfares that open new areas for development will

most influence this factor. New industry prefers good access that provides easy mobility into and out of the industrial area. A project can stimulate economic development in the immediate area and in adjacent areas.

Public Utilities

Utility service areas and existing utilities can be impacted by a thoroughfare plan. Some projects recommended will require relocation and disruption of utilities.

Transportation Costs

Transportation costs are useful in comparing alternative road systems and different projects. Level of service, vehicle operating costs, user time costs, accident costs, VMT, and VHT are measures include in transportation costs. (See Chapter 6 - Cost Estimates).

Capital Costs

Capital costs are also useful in comparing alternative road systems. They usually include construction costs and right-of-way costs as separate elements. (See Table 9)

Operation and Maintenance Costs

These are also used in comparing road systems. Costs associated with obsolete bridges, traffic control devices and systems, and roadways are examples of operation and maintenance costs.

VI. THE 1992 ADOPTED THOROUGHFARE PLAN

This chapter will discuss the adopted Thoroughfare Plan and the travel service of each corridor as it relates to the entire plan. The 1992 Adopted Thoroughfare Plan is shown in Figure 11.

FREEWAY

US 264

US 264 is Farmville's only Freeway. It was originally in the Farmville 1979 Thoroughfare Plan and completed in November 1991. It provides for through traffic movement while alleviating traffic in the southern portion of Farmville. It allows the old route US 264 Alternate to handle internal travel more efficiently.

MAJOR THOROUGHFARES

US 13

This route is located at the southern portion of the planning boundary. Although it carries a majority of through traffic, there are no plans for upgrading this facility. This facility is adequate for future year capacities.

US 258

This corridor traverses the entire planning area. It provides north-south travel service to the area. The southern portion of US 258 from US 264A to the southern planning boundary exceeds its practical capacity by the future year. ***It is recommended that this section be widened to a four lane divided facility.*** (See Extra Notes).

US 258 also goes through the central business district of Farmville on Wilson and Main Streets. This produces a lot of congestion in that area. ***A Bypass for US 258 is also recommended on new location to relieve the CBD and Fields Street of some congestion. A four lane divided facility is ultimately needed. However, until traffic warrants this, only a two lane facility is recommended. Right-of-way is recommended to be purchased for the future four lane facility. In addition, adequate turn lanes are recommended at the beginning and end of the Bypass. This will promote smooth traffic operations where the Bypass merge back into the existing US 258.*** The 1979 Thoroughfare Plan which preceded this Plan also includes a US 258 Bypass. However, the present plan moves the corridor closer to the Town of Farmville. The new location not only carries through traffic, relieves the CBD and Fields Street, but also serves internal traffic.

The Bypass will be partially controlled access to limit the amount of driveways. This will help to keep the movement of traffic flowing. ***It is also recommended, if commercial or industrial businesses locate onto the abutting property, that a site layout plan be required. A well designed site layout plan will funnel traffic into these properties quicker.*** Layouts designed in this way will discourage traffic backups and continue to allow the corridor to operate as a major thoroughfare. See Chapter 2 - Functional Classification for the definition of a major thoroughfare.

Farmville also has a US 258 Truck Route. The truck route presently runs on the following town streets. They are Turnage Street, Pine Street and Fields Street. These streets border the industrial and residential areas. This route provides an access for trucks to the industrial businesses along this corridor. Presently three percent of the ADT are multi-axle trucks. Likewise this route provides an access for most of the 2029 employees working in zones 11 and 12. (See Table B3 and Figure B2) ***It is recommended that a four lane connector from Turnage Street to Fields Street be built in the right-of-way of the abandoned railroad. This will provide better flow and traffic movement. It is also recommended that Fields Street be widened from two lanes to five lanes because by the design year this corridor exceeds practical capacity.***

US 264 Alternate

This is the old route for US 264. It stretches northwest to southeast on the south side of Farmville. ***US 264A should be widened from two lanes to five lanes at the present lane drop location near SR 1221. This section of roadway is about 1,600 feet. It extends from the shopping center to the intersection of SR 1221. This small section exceeds practical capacity.*** Otherwise, no improvements are recommended.

NC 121, Wilson Street, and SR 1139

These facilities provide a east-west movement through the center of Farmville. The facility begins at US 264A at its most westerly point and ends at US 13 at its most easterly point. No improvements are recommended for these facilities.

Stantonsburg Road (SR 1200)

This route is located north of US 264 from US 258 to the East Farmville Urban Area boundary. It was the most popular route used to reach the North Greenville Hospital area before the construction of US 264 Freeway. No improvements are recommended for this route.

Wesley Church Road (SR 1221)

This route from US 264 Freeway to US 264A was also on the 1979

Thoroughfare Plan. It is a part of Farmville's Loop System. Two lanes of SR 1221 was completed prior to the US 264 Freeway. Now this portion of SR 1221 is exceeding practical capacity by the future year. ***Therefore, it is recommended for the two additional lanes be added to this facility, making it a four lane divided facility.***

The Final Completion of Farmville's Loop System extends from US 264A to US 258 at the US 258 Bypass intersection. ***It is recommended that this portion of SR 1221 be a four lane divided facility. However, like US 258 Bypass, only a two lane facility is recommended until traffic warrants the improvement. Likewise, enough right-of-way should be purchased for the future four lane facility.***

Fields Street - See US 258 Truck Route

Fields Street Extension

This corridor will be a new facility extending down from US 264A to the US 258 Bypass. This corridor with the completion of Knox Schoolhouse Road will open up a more straight forward passageway to communities in the southwest quadrant of the Planning area. In addition, it will provide access to the proposed industrial park area. ***It is recommended that Fields Street Extension be a five lane urban roadway with sidewalks on each side.***

Three Schools Boulevard

This route is located in North Farmville. It extends from NC 121 to Wesley Church Road. This corridor provides another entrance into the school zone for traffic arriving from the North Planning area. Grimmersburg Street is mentioned in the Accident Profile with five accidents in the past three years. Three Schools Boulevard would relieve congestion and reduce the amount of accidents in the school zone. It also relieves local streets from traffic travelling through town to reach the school zone. In addition, it allows, more importantly, the school buses to avoid two Railroad crossings in connection with the High School Road Extension. ***This facility will be built on new location with two lanes, two feet paved shoulders and eight feet grassed shoulder.***

MINOR THOROUGHFARES

Stantonsburg Road (SR 1200)

This route changes from a major to minor thoroughfare on the west side of US 258. ***It is recommended that SR 1200 from the west Farmville Urban Area boundary to US 258 be widened. The roadway varies from 16 feet to 18 feet. It should be widened to a 20 feet roadway.***

Vines Street

This route will have an east and a west extension. The west extension runs from Fields Street to existing Vines Street and from existing Vines Street at Chestwood Drive to Wesley Church Road. The Fields Street side expansion provides another access for the residential community other than Main Street, while the Chestwood Drive side provides additional land to be opened for development. ***It is recommended that the west extension have identical road structure to the existing Vines Street. This road structure is two lanes with curb and gutter and parking and sidewalks on each side of the road.***

The east extension runs from Wesley Church Road to the proposed Chinquapin Road extension. This is a long range project which provides highway structure once land opens for development. This extension also encourages development. ***It is recommended that a two lane rural highway with two feet paved shoulders and eight feet grassed shoulders be constructed.***

Pitt Street Extensions

This route also has two extensions. They are on the north and south sides of the existing Pitt Street. The North extension extends from Hollywood Cemetery to Three Schools Boulevard. The South extension extends from near Prince Road to US 264A. When completed, this corridor will provide an alternate route to Main Street. It will provide access to residential and school areas quickly and open up areas for development. ***A two lane curb and gutter urban roadway with parking and sidewalks on each side is recommended.***

Church Street Extension

This route extends from Moye Street to Grimmersburg Road at the High School Road Intersection. This provides another east-west alternative to Wilson Street. It also relieves congestion from Grimmersburg Road for those travelling from the east to west with an origin or destination from the school zone. ***A two lane curb and gutter urban roadway with parking and sidewalks on one side is recommended.***

High School Road Extension

This route extends from Farmville Central High School to Three Schools Boulevard. It works in conjunction with Three Schools Boulevard to relieve congestion in and around the school zone. It also allows school buses to avoid two railroad crossings. ***It is recommended that this route be a two lane rural roadway with two feet paved shoulders and eight feet grassed shoulders.***

Knox Schoolhouse Road (SR 1302) Extension

This route, in Greene County, provides a more direct route in

Thoroughfare Plan. It is a part of Farmville's Loop System. Two lanes of SR 1221 was completed prior to the US 264 Freeway. Now this portion of SR 1221 is exceeding practical capacity by the future year. ***Therefore, it is recommended for the two additional lanes be added to this facility, making it a four lane divided facility.***

The Final Completion of Farmville's Loop System extends from US 264A to US 258 at the US 258 Bypass intersection. ***It is recommended that this portion of SR 1221 be a four lane divided facility. However, like US 258 Bypass, only a two lane facility is recommended until traffic warrants the improvement. Likewise, enough right-of-way should be purchased for the future four lane facility.***

Fields Street - See US 258 Truck Route

Fields Street Extension

This corridor will be a new facility extending down from US 264A to the US 258 Bypass. This corridor with the completion of Knox Schoolhouse Road will open up a more straight forward passageway to communities in the southwest quadrant of the Planning area. In addition, it will provide access to the proposed industrial park area. ***It is recommended that Fields Street Extension be a five lane urban roadway with sidewalks on each side.***

Three Schools Boulevard

This route is located in North Farmville. It extends from NC 121 to Wesley Church Road. This corridor provides another entrance into the school zone for traffic arriving from the North Planning area. Grimmersburg Street is mentioned in the Accident Profile with five accidents in the past three years. Three Schools Boulevard would relieve congestion and reduce the amount of accidents in the school zone. It also relieves local streets from traffic travelling through town to reach the school zone. In addition, it allows, more importantly, the school buses to avoid two Railroad crossings in connection with the High School Road Extension. ***This facility will be built on new location with two lanes, two feet paved shoulders and eight feet grassed shoulder.***

MINOR THOROUGHFARES

Stantonsburg Road (SR 1200)

This route changes from a major to minor thoroughfare on the west side of US 258. ***It is recommended that SR 1200 from the west Farmville Urban Area boundary to US 258 be widened. The roadway varies from 16 feet to 18 feet. It should be widened to a 20 feet roadway.***

Vines Street

This route will have an east and a west extension. The west extension runs from Fields Street to existing Vines Street and from existing Vines Street at Chestwood Drive to Wesley Church Road. The Fields Street side expansion provides another access for the residential community other than Main Street, while the Chestwood Drive side provides additional land to be opened for development. ***It is recommended that the west extension have identical road structure to the existing Vines Street. This road structure is two lanes with curb and gutter and parking and sidewalks on each side of the road.***

The east extension runs from Wesley Church Road to the proposed Chinquapin Road extension. This is a long range project which provides highway structure once land opens for development. This extension also encourages development. ***It is recommended that a two lane rural highway with two feet paved shoulders and eight feet grassed shoulders be constructed.***

Pitt Street Extensions

This route also has two extensions. They are on the north and south sides of the existing Pitt Street. The North extension extends from Hollywood Cemetery to Three Schools Boulevard. The South extension extends from near Prince Road to US 264A. When completed, this corridor will provide an alternate route to Main Street. It will provide access to residential and school areas quickly and open up areas for development. ***A two lane curb and gutter urban roadway with parking and sidewalks on each side is recommended.***

Church Street Extension

This route extends from Moye Street to Grimmersburg Road at the High School Road Intersection. This provides another east-west alternative to Wilson Street. It also relieves congestion from Grimmersburg Road for those travelling from the east to west with an origin or destination from the school zone. ***A two lane curb and gutter urban roadway with parking and sidewalks on one side is recommended.***

High School Road Extension

This route extends from Farmville Central High School to Three Schools Boulevard. It works in conjunction with Three Schools Boulevard to relieve congestion in and around the school zone. It also allows school buses to avoid two railroad crossings. ***It is recommended that this route be a two lane rural roadway with two feet paved shoulders and eight feet grassed shoulders.***

Knox Schoolhouse Road (SR 1302) Extension

This route, in Greene County, provides a more direct route in

and out of the southwest quadrant in conjunction with the Fields Street Extension. Residential communities will find it easier to reach the major thoroughfares with this route. It also opens land up for development. ***It is recommended for this route to be a rural two lane roadway with two feet paved shoulders and eight feet grassed shoulders. A Box Culvert is needed at the Swamp crossing.***

Chinquapin Road (SR 1218) Extension

This route provides another north-south movement from SR 1200 to US 264A. This long range project also provides highway structure once additional lands open for development. ***It is recommended for this extension to be a two lane rural roadway with two feet paved shoulders and eight feet grassed shoulders.***

Roberts May Drive

This is a new facility extending from NC 121 to US 264A. This facility would open up land to development. This is another long range project which land use and traffic needs warrant any construction. ***It is recommended for a rural two lane roadway with two feet paved shoulders and eight feet grassed shoulders.***

Other minor thoroughfares in the Farmville Urban Area need no improvements are as follows:

Pitt County	Tugwell Road (SR 1144)
	Lewis Store Road (SR 1229)
	Toddy Road (SR 1241)
	Seven Pines Road (SR 1245)
	Horne Street
Greene County	Moye Road (SR 1301)
	Nash Road (SR 1320)

Extra Notes

Implementation of the Thoroughfare Plan will raise the Farmville Urban Area's level of service to "C". However some things should be addressed in the future. US 258 exceeds practical capacity by year 2020 from US 264A to the southern planning boundary. Widening this facility to four lanes is recommended for this area in this 1992 Plan. However, with the recent approval by the Governor for the implementation of the North Carolina Global Transpark, Kinston Air Cargo Project; US 258 may need to be widened to a four lane divided facility even before then.

THOROUGHFARE PRIORITY NEEDS AND COST ESTIMATES

The recommendations suggested in the Farmville Urban Area Thoroughfare Plan cannot be constructed all at once. The cost would be overwhelming and the need for some of the recommendations is not immediate. In an effort to distinguish which recommendations should be given priority, a benefits matrix model is applied. Whereas, an assessment of the benefits expected from each project is compared to the projected costs.

There are five principal measures of benefits used in this model. These measures provide a basis for evaluating how well projects meet their objectives. They are listed below.

1) User Benefits
2) Costs
3) Economic Development Potential
4) Environmental Impact
5) Relationship of Project to State Arterial System

User benefits are computed from the savings an improvement project brings through reduced vehicle operating costs, travel costs, and accident costs. This savings is compared to a do-nothing alternative.

Construction costs and right-of-way costs are the only costs utilized in the benefits matrix model. Construction costs consists of all costs to construct a project. Whereas right-of-way costs include relocation costs of residences, businesses and utilities, as well as, land costs.

Construction costs can offset the benefits of a project. Despite a projects high projected benefits, excessive construction costs may prove unreasonable to construct. The construction costs were estimated by the Preliminary Estimates Section of the Design Services Unit of NCDOT. The right-of-way costs are estimated as an average of three sources. The sources were Farmville's Planning Director, NCDOT's Area Appraisal office, and a local Real Estate office.

Economic development potential and environmental factors are measured using probability. Economic probability is established as a result of the development an improvement will bring to the area. A project is successful when it stimulates economic development in the area, increases level of service, or makes land accessible. The probability is rated on a scale from 0.00 (none) to 1.00 (excellent). The environmental factors measured were discussed in detail in Chapter 5. However, a summation of both positive and negative impact probabilities provides a measure of the relative environmental impact of a project.

Table 9 lists the recommended thoroughfare priority needs for the Farmville Urban Area Thoroughfare Plan. The Table evaluates the proposed Farmville Urban Area projects with respect to user benefits, estimated costs, probability of economic development, and environmental impact. As conditions are constantly changing, the priorities should be reevaluated prior to construction.

TABLE 9

IMPROVEMENT PRIORITIES, BENEFITS ANALYSIS, AND COST ESTIMATES FOR SELECTED PROJECTS IN FARMVILLE

PRIORITY	SELECTED PROJECTS	LENGTH (MILES)	TOTAL BENEFIT (x$1000s)	COST (x $1000) CONSTR	ROW	TOTAL	ECONOMIC DEVELOPMENT POTENTIAL PROBABILITY	ENVIRONMENTAL IMPACT PROBABILITY +	-
MAJOR THOROUGHFARES									
1	THREE SCHOOLS BLVD.	1.30	$18,770.1	$1,900	$ 268	$2,168	0.38	0.55	0.25
2	US 258 BYPASS	4.40	9,782.0	5,900	1,830	7,730	0.75	0.46	0.25
3	SR 1221 - LOOP COMPL.	0.70	7,978.5	1,250	289	1,539	0.75	0.24	0.10
4	FIELDS STREET EXT.	0.80	4,381.3	1,700	148	1,848	0.75	0.38	0.10
5	US 258 TRUCK RT. CONN.	0.30	36.6	550	43	593	0.50	0.50	0.25
MINOR THOROUGHFARES									
1	SR 1302 - GREENE CO.	1.20	9,452.2	1,350	247	1,597	0.50	0.30	0.25
2	VINES ST. WEST OF SR 1221	1.10	8,621.0	1,900	156	2,056	0.50	0.33	0.10
3	PITT STREET EXT.	1.00	8,186.6	1,675	145	1,820	0.50	0.23	0.15
	- NORTH	0.35		625	51	676			
	- SOUTH	0.65		1,050	94	1,144			
4	HIGH SCHOOL ROAD EXT.	0.26	1,758.2	300	54	354	0.38	0.28	0.18
5	CHURCH STREET EXT.	0.55	186.0	850	68	918	0.25	0.20	0.10
LONG RANGE PROJECTS									
1	SR 1218 -CHINQUAPIN RD.	1.20	2,025.3	1,350	247	1,597	0.50	0.38	0.10
2	ROBERTS MAY DRIVE	0.75	1,800.0	900	155	1,055	0.25	0.20	0.20
3	VINES ST. EAST OF SR 1221	1.00	1,660.7	1,150	210	1,360	0.25	0.18	0.10
WIDENING PROJECTS									
1	US 258 - SOUTHERN PORTION	3.69	12,423.4	5,535	760	6,295	0.56	0.42	0.25
2	SR 1221 - US264F TO US264A	2.74	2,617.8	4,610	- 0 -	4,610	0.63	0.35	0.25
3	FIELDS STREET WIDENING	0.90	1,004.0	1,650	- 0 -	1,650	0.38	0.25	0.00
4	SR 1200 - WEST OF US 258	2.74	809.2	1,370	23	1,393	0.25	0.28	0.10

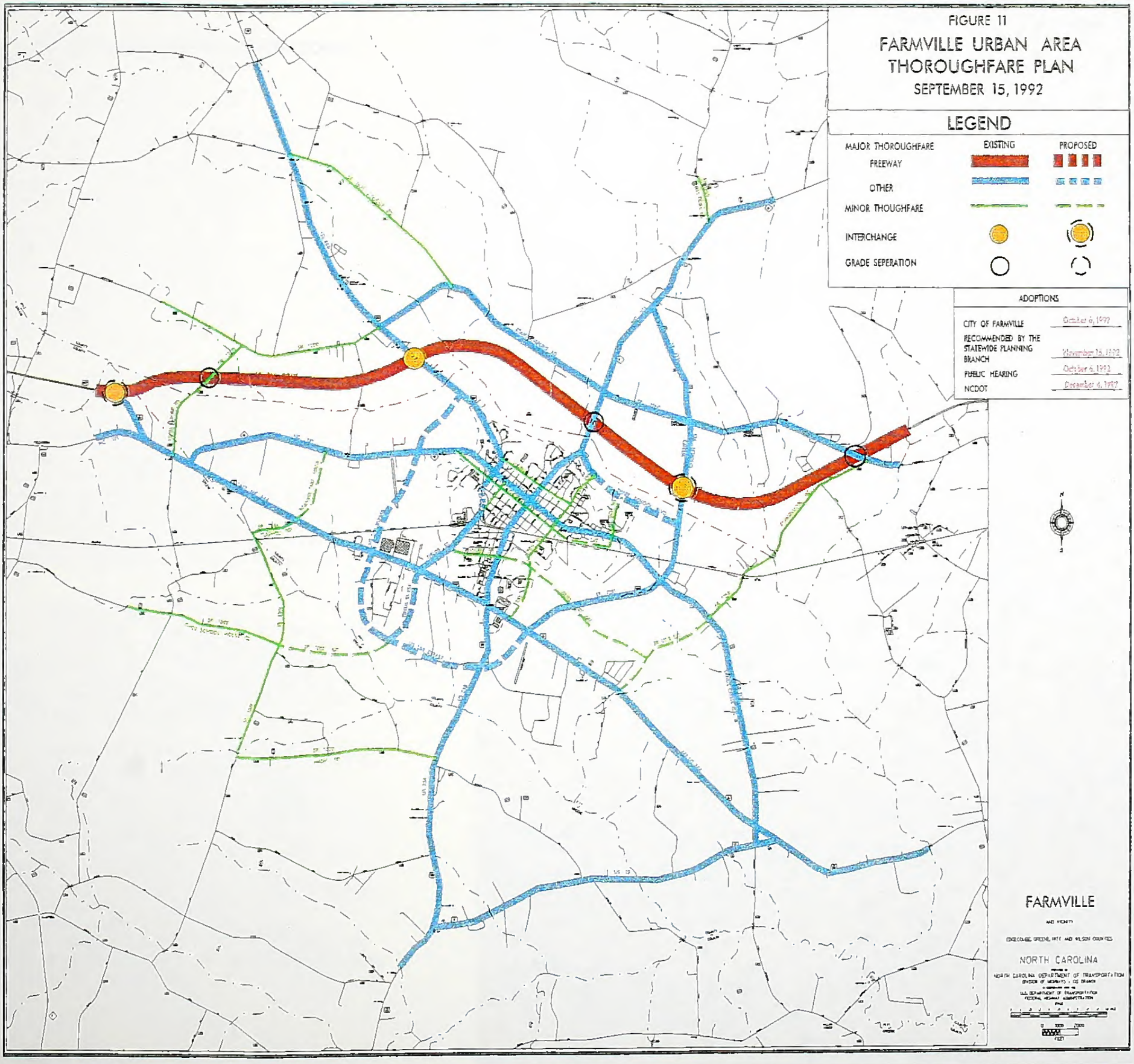


FIGURE 11
FARMVILLE URBAN AREA
THOROUGHFARE PLAN
SEPTEMBER 15, 1992
LEGEND
MAJOR THOROUGHFARE
EXISTING
PROPOSED
FREEWAY
OTHER
MINOR THOUGHFARE
INTERCHANGE
GRADE SEPERATION
ADOPTIONS
CITY OF FARMVILLE
October 6, 1992
RECOMMENDED BY THE STATEWIDE PLANNING BRANCH
November 16, 1992
PUBLIC HEARING
October 6, 1992
NCDOT
December 4, 1992
FARMVILLE
AND VICINITY
CRAVEN, GREENE, PITT AND WILSON COUNTIES
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - GIS BRANCH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
1000
2000
FEET

VII. ADMINISTRATIVE CONTROLS AND IMPLEMENTATION TOOLS

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 that 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 that serve primarily internal travel.

Unless implementation is an integral part of the transportation planning process, the effort and expense associated with developing a plan is lost. To neglect the implementation process is a three-fold loss; the loss of the capital expenditures used in developing a plan, the opportunity cost of the capital expenditures, and more importantly the loss of the benefits that would accrue from an improved transportation system.

Administrative controls and implementation tools that can aid in the implementation process are generally available to municipalities through Federal and State Legislation. These controls and tools will be discussed in this chapter. They include: Subdivision Regulations, Zoning Ordinances, Official Maps, Urban Renewal, Capital Improvements Programs, and Development Reviews. Generally two issues play a major role in the implementation process, available finances and citizen involvement. Effective use of the controls and tools listed above are indicative of good planning and minimize the effects of limited finances and negative citizen reaction to specific elements of a plan. It is through good planning that maximum use is made of every available dollar and that citizen involvement and approval of the transportation plan is obtained.

Subdivision Regulations

Subdivision regulations are locally adopted laws governing the process of converting raw land into building sites. From the planner's view, subdivision regulations are important at two distinct levels. First, they enable him to coordinate the otherwise unrelated plans of many individual developers. This process assures that provision is made for land development elements such as roadway right-of-way, parks, school sites, water lines, sewer outfalls, and so forth. Second, they enable him to control the internal design of each new subdivision so that its pattern of streets, lots, and other facilities will be safe, pleasant, and economical to maintain.

To be most effective, subdivision regulations and their administration must be closely coordinated with other local governmental policies and ordinances. Among the more important of these are the Comprehensive Growth Plan, Utilities Extension Master Plan, and Thoroughfare Plan.

In practice, subdivision regulations can provide very positive benefits such as requiring portions of major streets to be constructed in accordance with the Thoroughfare Plan, or requiring subdividers to provide for the dedication and/or reservation of rights-of-way in advance of construction. These practices reduce the overall cost of the plan by having some costs borne by developers. Recommended Subdivision Ordinances are included in Appendix E.

* Vines Street from Fields Street to Chinquapin Road(SR 1218), the southern extension of Pitt Street, Chinquapin Road from US 264 Alternate to Langs Crossroads(SR 1139), Knox Schoolhouse Road (SR 1302) from Moye Road(SR 1301) to US 258 Bypass, and Roberts May Drive could benefit from developer cooperation through subdivision regulations.

Zoning Ordinances

Zoning is probably the single most commonly used legal device available for implementing a community's land-use plan. To paraphrase the U.S. Department of Commerce 1924 Standard Zoning Enabling Act, on which most present-day legislation is based, zoning may be defined as the division of a municipality (or other governmental unit) into districts, and the regulation within the districts of:

1. the height and bulk of buildings and other structures,
2. the area of a lot that may be occupied and the size of required open spaces,
3. the density of population, and
4. the use of buildings and land for trade, industry, residence, or other purposes.

The characteristic feature of the zoning ordinance that distinguishes it from most other regulations is that it differs from district to district, rather than being uniform throughout a

city. Thus, a given area might be restricted to single-family residential development with minimum lot size requirements and setback provisions appropriate for development. In other areas, commercial or industrial development might be permitted, and regulations would be enacted to control such development. Building code provisions or sanitary regulations, on the other hand, normally apply to all buildings in a certain category regardless of where they may be situated within a city.

The zoning ordinance does not regulate the design of streets, utility installation, the reservation or dedication of parks, street rights-of-way, school sites, and related matters. These are controlled by subdivision regulations or possibly by use of an official map. The zoning ordinance should however, be carefully coordinated with these and other control devices.

Official Maps

The roadway corridor official map (or official map) is a document, adopted by the legislative body of the community, that pinpoints and preserves the location of proposed streets against encroachment. In effect, the official map serves notice on developers that the State or municipality intends to acquire certain specific property. The official map serves as a positive influence for sound development by reserving sites for public improvements in anticipation of actual need.

The NCDOT position is that it will limit the use of official maps to large scale, fully access controlled facilities planned for rapidly developing areas outside of municipal jurisdictions. For projects within municipal jurisdictions, official maps should be prepared and adopted by the local government. Municipalities may adopt official maps that extend beyond its extraterritorial jurisdiction with approval from the Board of County Commissioners.

It should be recognized that an official map places severe but temporary restrictions on private property rights. These restrictions are in the form of a prohibition, for up to three years, on the issuance of building permits or the approval of subdivisions on property lying within an official map alignment. The three year reservation period begins with the request for development approval. This authority should be used carefully and only in cases where less restrictive powers are found to be ineffective.

Requests for NCDOT to prepare and adopt an official map should be directed to the manager of the Program, Policy and Budget Branch. For cities contemplating the adoption of an official map, there are two ways in which the city may proceed. The first is to consider the official map statute as a stand-alone authority and use it as the basis for local adoption of an official map. Alternatively, the second approach is to adopt a local ordinance modeled after the statute, but modified to fit local circumstances and clarify the statute. Regardless of the approach taken, several procedural steps will need to be considered, such as establishing procedures for consideration of variance petitions.

Once the project has been selected and the alignment determined, maps must be prepared that are suitable for filing with the County Register of Deeds Office. The map should show the proposed alignment in sufficient detail to identify the functional design and the preliminary right-of-way boundaries. Since the purpose of the map is to show the effect on properties along the project path, the existing property boundaries should be identified. As an additional requirement, within one year of the adoption of an official map, work must begin on an environmental impact study or preliminary engineering.

It is important to recognize the risks inherent in the adoption of an official map prior to completing the environmental studies. Projects to be funded using any federal funds require the unbiased evaluation of alternate alignments. This means that other alternatives will be studied and compared to the protected alignment.

The above information is only to serve as an introduction to official maps, and in no way provides the information necessary to begin development of an official map. 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 Official Maps" at:

Programming, Policy and Budget Branch
NC Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611

Urban Renewal

Urban renewal plays a minor role in the transportation planning implementation process in terms of scope and general influence. However, under the right circumstances, renewal programs can make significant contributions. Provisions of the New Housing Act of 1974 (as amended) call for the conservation of good areas, rehabilitation of declining areas, and clearance of slum areas. In the course of renewal, it is important to coordinate with the Thoroughfare Plan to see if additional set-back or dedication of right-of-way is needed.

Continued use of the urban renewal programs to improve the transportation system is encouraged. Changes that can be made under this program are generally not controversial or disruptive given the trauma of the clearance of a significant area.

Capital Improvement Programs

Capital programs are simply the coordination of planning and money. The capital improvements program, with respect to transportation, is a long range plan for the spending of money on street improvements, acquisition of rights-of-way and other improvements within the bounds 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 warranted.

Historically, cities and towns have depended, to a great degree, on Federal or State funding to solve their transportation problems. Chapter 136-Article 3A of the Road and Highway Laws of North Carolina outlines the responsibilities and obligations of the various governmental bodies regarding highway improvements. North Carolina Highway Bill 1211 of 1988 limits the role of municipalities in right-of-way cost sharing for projects once they are programed in the NCDOT Transportation Improvement Program. Set-back regulations, right-of-way dedications and reservations play a major role in the ultimate cost of many facilities. Only in special cases will the municipality be able to enjoy the benefits of highway improvements without some form of investment.

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 allowed. 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 Branch, Statewide Planning Branch, and Roadway Design Branch 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 developers, it is important that the municipality advise them of this review requirement and cooperate in the review process.

* The Southern Pitt Street Extension at US 264 Alternate and any development off US 258 Bypass is a prime example of where the development review process could make a difference in the final alignment and cost of the project.

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 city or 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, water and sewer bills could be increased to cover the cost of street improvements.

APPENDIX A

STREET TABULATIONS

AND

ROAD NAME DIRECTORY

TABLE A1 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FARMVILL URBAN AREA FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (FUTURE)	1991 ADT	2020 ADT	RDWAY (ULT)	ROW (ULT)
US 13								
S.Boundary-US258 Split	0.59	22	100	(45,000)	8,100	18,800	B	100
US258 Split - Pitt Co.	2.19	24	60	12,000	3,800	5,600	ADQ	100
Pitt Co.-US264A Merge	1.52	24	100	12,000	3,800	5,800	ADQ	ADQ
US264A Merge-E.Bound.	1.89	24	100	12,000	10,800	12,200	ADQ	ADQ
US 258								
US 13 Split - Pitt Co.	2.33	22	100	(45,000)	4,600	13,400	B	200
Pitt Co. - US 258 Byp	0.79	22	100	(45,000)	4,600	14,000	B	200
US 258 Byp - US 264A	0.60	22	~60	11,000	4,600	6,000	D	100
US 264A - Railroad St.	0.44	22	100	11,000	6,900	10,300	H	ADQ
Railroad St. - NC 121	0.37	22	100	11,000	7,300	6,900	ADQ	ADQ
NC 121 - May Blvd.	0.48	22	100	11,000	4,700	2,500	ADQ	ADQ
May Blvd. - N.C.L.	0.79	24	~60	12,000	3,700	6,800	ADQ	100
N.C.L. - US 258 Bypass	0.43	22	100	11,000	2,000	6,300	L	ADQ
US 258 Byp - US 264F	0.74	22	100	11,000	2,000	11,500	C	110
US 264F - N. Boundary	3.68	22	100	11,000	2,000	4,400	L	ADQ
US 258 Bypass								
N. US 258 - US 264A	2.30			(35,000)		5,400	B	200
US 264A - S. US 258	2.56			(35,000)		2,900	B	200
US 258 Trk Rt. Conn.								
Pine St. - Fields St.	0.30			(12,000)		300	H	70
US 264 Freeway								
West Bound. - US 258	3.35	24	228	60,000	5,000	18,300	ADQ	ADQ
US 258 - SR 1221	3.71	24	228	60,000	7,300	12,700	ADQ	ADQ
SR 1221 - East Bound.	2.81	24	228	60,000	9,000	22,400	ADQ	ADQ

PRACTICAL CAPACITY defined as D-LOS for Urban Facilities
~ = approximation

TABLE A1 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FARMVILL URBAN AREA FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (FUTURE)	1991 ADT	2020 ADT	RDWAY (ULT)	ROW (ULT)
US 264 Alternate								
US 264F - Pitt Co.	1.39	24	150	12,000	2,900	6,700	ADQ	ADQ
Pitt Co. - SR 1144	0.92	24	150	12,000	2,900	5,800	ADQ	ADQ
SR 1144 - US 258 Byp.	0.66	68	150	28,000	8,300	6,900	ADQ	ADQ
US 258 Byp - Fields St	0.89	68	150	28,000	6,500	22,800	ADQ	ADQ
Fields St. - SR 1221	1.44	68	150	28,000	6,500	14,900	ADQ	ADQ
SR 1221 - US 13	3.72	24	180	12,000	6,500	7,100	ADQ	ADQ
NC 121								
East Bound. - US 264A	0.49	24	140	12,000	1,700	1,900	ADQ	ADQ
US 264A - Pitt Co.	0.07	24	100	12,000	1,400	1,700	ADQ	ADQ
Pitt Co. - US 258	3.26	24	60	12,000	1,400	2,200	ADQ	100
US 258 - SR 1200	0.65	38	100	12,000	3,600	6,800	ADQ	ADQ
SR 1200 - North Bound.	2.00	20	060	10,000	1,600	3,300	L	100
PITT COUNTY								
SR 1139								
US 13 - US 264A	0.20	16	~60	8,000	700	1,800	L	100
US 264A - Moye Street	3.90	22	~60	11,000	1,400	3,600	L	100
Moye Street - NC 121	0.54	30	100	11,000	4,000	6,600	ADQ	ADQ
SR 1144								
US 264A - Greene Co.	0.60	18	~60	9,000	600	800	L	100
SR 1200								
East Bound. - US 258	5.60	18	~60	9,000	1,800	2,300	L	100
US 258 - SR 1229	1.50	20	~60	11,000	800	1,200	L	100
SR 1229 - West Bound.	0.95	16	~60	(11,000)	400	1,000	L	100

PRACTICAL CAPACITY defined as D-LOS for Urban Facilities
~ = approximation

TABLE A1 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FARMVILL URBAN AREA FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (FUTURE)	1991 ADT	2020 ADT	RDWAY (ULT)	ROW (ULT)
SR 1218								
US 264A - SR 1139	1.20			(12,000)		500	L	100
SR 1139 - SR 1200	2.40	18	60	9,000	600	2,900	L	100
SR 1221								
US 258 - US 264A	0.70			(35,000)		6,100	B	200
US 264A - SR 1139	1.5	24	200	(35,000)	1,800	9,500	B	ADQ
SR 1139 - US 264F	1.0	24	200	(35,000)	6,800	10,300	B	ADQ
US 264F - SR 1200	0.68	20	60	10,000	1,200	3,200	L	100
SR 1200 - NC 121	1.20	20	60	10,000	700	1,000	L	100
SR 1229								
SR 1200 - Greene Co.	0.88	20	60	10,000	400	900	L	100
Greene Co. - US 264A	0.42	18	60	9,000	400	900	L	100
SR 1241								
SR 1200 - US 258	2.20	18	60	9,000	650	600	L	100
US 258 - SR 1232	1.10	19	60	9,500	350	300	L	100
SR 1245								
North Bound. - NC 121	0.50	20	~60	10,000	650	1,300	L	100
GREENE COUNTY								
SR 1301								
SR 1320 - Pitt Co.	2.40	18	~60	9,000	250	700	L	100

PRACTICAL CAPACITY defined as D-LOS for Urban Facilities
~ = approximation

TABLE A1 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FARMVILL URBAN AREA FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (FUTURE)	1991 ADT	2020 ADT	RDWAY (ULT)	ROW (ULT)
SR 1302								
West Bound. - SR 1301	1.80	18	~60	9,000	200	800	L	100
SR 1301 - US258 Bypass	1.20			(12,000)		1,300	L	100
SR 1320								
SR 1301 - US 258	2.10	16	~60	8,000	350	500	L	100
Farmville Local Streets								
Church Street								
NC 121 - Moye St.	1.40	22	~60	11,000	1,400	3,700	L	100
Moye St. - SR 1139	0.55			(12,000)		200	K	60
Fields Street								
US 258 Bypass - US264A	0.80			(12,000)		1,100	D	90
US 264A - Wilson St.	1.31	18	150	(24,000)	4,200	9,000	D	90
High School Road								
SR 1139 - Sch. Drway.	0.20	22	~60	11,000	400	600	L	100
Sch. Drway-3 Sch. Blvd	0.26			(12,000)		600	L	100
Horne Street								
US 258 - Pitt St.	0.8	20	~60	10,000	1,000	1,100	L	100
Pitt Street								
US 264A - Anderson Dr.	0.32			(12,000)		3,300	J	70
Anderson Dr-Godwin Dr.	0.02	22	~70	11,000	----	3,300	J	70
Godwin Dr. - Dirt Rd.	0.31			(12,000)		3,300	J	70

PRACTICAL CAPACITY defined as D-LOS for Urban Facilities
~ = approximation

TABLE A1 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FARMVILL URBAN AREA FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (FUTURE)	1991 ADT	2020 ADT	RDWAY (ULT)	ROW (ULT)
Pitt Street (cont.)								
Dirt Rd-Hollywood Cem.	2.30	22	~70	11,000	1,000	5,300	J	70
Hollywood - 3 Sch Blvd	0.35			(12,000)		3,600	J	70
Vines Street								
Fields St. - Wright St	0.33			(12,000)		1,300	J	70
Wright St-Chestwood Dr	0.49	24	~70	12,000	1,000	1,300	J	70
Chestwood Dr - SR 1221	0.77			(12,000)		1,100	J	70
SR 1221 - SR 1218	1.00			(12,000)		500	L	100
<u>New Proposed Roads</u>								
Three Schools Boulevard								
NC 121 - SR 1221	1.30			(12,000)		3,000	L	100
Roberts May Drive								
US 254A - NC 121	0.75			(12,000)		300	L	100

PRACTICAL CAPACITY defined as D-LOS for Urban Facilities
~ = approximation

Table A2		
State Road Name Directory for Farmville Urban Area Thoroughfare Plan		
County	State Route	Road Name
Greene	1301	Moye Road
	1302	Knox Schoolhouse Road
	1320	Nash Road
Pitt	1139	Langs Crossroads
	1144	Tugwell Road
	1200	Stantonsburg Road
	1218	Chinquapin Road
	1221	Wesley Church Road
	1229	Lewis Store Road
	1241	Toddy Road
	1245	Seven Pines Road

ACRONYMS

EAF	External-Internal Attraction Factors
E-I	External-Internal
EXTRPA	External Trip Attractions
EXTRPP	External Trips
HBWAF	Home-Base Work Attraction Factors
HBWAT	Home-Base Work Trip Productions
HBWTRP	Home-Base Work Trips
IDS	Internal Data Summary
INTTRP	Internal Trips
NAF	Non Home-Base Work Attraction Factors
NHBAT	Non Home-Base Work Trip Productions
NHBSEC	Non Home-Base Work Secondary Trips
NHBTRP	Non Home-Base Work Trips
OAF	Other Home-Base Attraction Factors
OHBAT	Other Home-Base Trip Productions
OHBTRP	Other Home-Base
TOTTRP	Total Trips
ZN	Zone

APPENDIX B

TRAVEL MODEL ANALYSIS

TRAVEL MODEL ANALYSIS

Travel Model Analysis takes the existing highway system as it functions today and simulates it using the advanced computer software, TRANPLAN. The existing highway system is made of the road network, traffic on the network, and land use. Once the modelled system functions (or is calibrated) like the existing system; future projections are inputed to develop the future highway system. The model is designed to test different road networks. Effects of future traffic on various road networks are then studied. Transportation modelling is a tool to assist the engineer in testing land use and network alternatives. It is not a substitute for the experience or judgment of the engineer.

Models are developed to (1) estimate trips produced (origins) and trips attracted (destinations) by traffic zones and (2) to estimate travel patterns between zones. Separate models are developed for the three basic types of trips: internal, internal-external, and through. **Internal trips** are defined as those trips which have both an origin and destination inside the planning area. An **internal-external trip** is a trip which has one end inside the planning area and the other outside. **Through trips** are defined as those trips which travel through the area and have both an origin and destination outside the study area. The validity of the models are tested by comparing the traffic volumes computed by the models to traffic volume counts taken on the existing road network.

Present Travel

Travel forecasting models were developed and calibrated for the area using 1991 socio-economic data and traffic counts. The techniques employed are in accordance with North Carolina's Urban Travel Forecasting Procedures.

The planning area increased since the last thoroughfare plan in 1979. The 1979 Thoroughfare Plan is shown in Figure B1. The planning area is approximately 55.7 square miles and includes the entire old planning area. The old planning area has only 30 zones. Whereas the new planning area has 66 zones. Some of the large perimeter zones in the old planning area were split into two or more zones. (See Figure B2). The increase covers areas that now use Farmville for economic purposes. This includes the majority of the Farmville Township, the lower parts of Fountain and Falkland Townships, the western side of Arthur Township, and the northern part of Greene County.

Two surveys obtained the socio-economic data. The surveys were the housing and employment survey. The Town of Farmville provided staff to collect the housing and employment data. Several improvements have been made in North Carolina's travel forecasting procedures for the housing collection. The housing rating was changed to reflect five main categories of economic conditions with an extra sixth condition for special housing. Only five main categories were used in this study. (See Table B2 and B3). The employment survey consists of total employment at

establishments, types of employment, trucks and commercial automobiles garaged at these establishments, and taxis. (See Table B4 and B5)

A traffic survey for Farmville was also taken. The survey was completed by the Traffic Survey Unit of the Statewide Planning Branch. The traffic survey consists of 1991 average daily and hourly traffic counts. Traffic counts were taken at roads that crossed screenlines, stations along the planning boundary, and other specific locations for model calibration purposes. Traffic counts were taken after school openings; and before and after the opening of US 264 Freeway. Farmville was a unique model. Travel Model Analysis was computed on Farmville's existing highway system before and after the opening of US 264. Analyzing the two highway systems was very useful in detecting how travel on the existing highway changed with the implementation of the Freeway. The existing highway without the Freeway provided a check for the model with the Freeway.

Trip Productions

Average weekday trip productions were estimated on a zonal basis in three categories: (1) trips produced by dwelling units, (2) trips produced by commercially used vehicles, and (3) trips produced by taxis. Dwelling unit trip generation rates by housing condition were estimated. Likewise, 6.7 trips per commercially owned vehicle and 40 trips per taxi were estimated. All rates were adjusted for the calibration of the model as determined by screenline checks. Specifically, the generation rates in the average and below average housing categories were adjusted. These rates needed to be increased to compensate for the low classification given in the below average category. Usually there should be more average dwelling units than below average dwelling units.

An important part of the model calibrations are screenlines. A screenline is an imaginary line drawn across a part or the entire planning area. Counts are taken at every street that crosses this line and the total volume of traffic is determined. This volume can then be compared to a similar volume obtained from the synthetic modeling process. This accuracy check will indicate if the total amount of travel on the network is correct. Final model calibration reflected the following screenline accuracy checks:

(1) Screenline A - 102% (north-south screenline following US 258)

(2) Screenline B - 108% (east-west screenline following the Norfolk-Southern Railroad)

The total trips generated by dwelling units, commercial vehicles, and taxis produce total internally generated trips. They were adjusted to account for trips made by vehicles garaged inside the planning area but with destinations outside the planning area. The adjusted internal travel was separated into three purposes: home-base work (HBW) 23%, other home-based (OHB) 55%, and non home-based (NHB) trips 22%. In addition are

secondary non home-based trips. These are internally generated trips made by vehicles garaged outside the planning area. They are added to the internally produced non home-based trips and distributed to each zone based on each zone's relative attractiveness as determined by the internal regression equation. Zonal productions are developed automatically in a program developed by the NCDOT. This program is call the Internal Data Summary. Table B6 and B7 shows the IDS calculations for 1991 and 2020, respectively.

Secondary NHB Trip Equation:

Secondary NHB Trips = 0.4 x (Total Ext-Int Trips - Ext-Int Trips Garaged Inside Planning Area)

The internal regression equation used in trip productions was developed by Dr. Leftwich at the University of Central Florida at Orlando. The old study had an existing regression equation that was developed using the external origins and destinations survey. Dr. Leftwich's equation was developed using travel data gathered from 16 urban area in North Carolina. This equation was calibrated for the new planning area which resulted in the internal trip equation and external-internal equation being slightly different.

The Multiple Regression Equations used:

HBW: Trip Attractions = Total Employment for each zone

OHB: $Y = (0.5)X_1 + (1.83)X_2 + (8.36)X_3 + (2.6)X_4 + (2.55)X_5 + (0.5)X_{10}$

NHB: $Y = (1.0)X_1 + (1.83)X_2 + (8.36)X_3 + (2.6)X_4 + (2.55)X_5 + (0.1)X_{10}$

E-I: $Y = (1.5)X_1 + (1.83)X_2 + (8.36)X_3 + (2.6)X_4 + (2.55)X_5 + (1.5)X_{10}$

Where, Y = Attraction Factor

X_1 = Industrial
X_2 = Other Retail
X_3 = Highway Retail
X_4 = Office
X_5 = Service
X_{10} = Dwelling Unit

Trip Attractions

The HBW attraction factors are total employment within each zone. Factors for OHB, NHB, and external-internal (E-I) purposes were developed using the multiple regression equation "borrowed" from Dr. Leftwich's analysis. The regression analysis uses zonal employment and housing as the independent variables and computes an estimate of trips attracted as the dependent variable. Total attractions are balanced to equal total productions by purpose. The balanced trip attractions from this analysis are shown in the first four columns of Tables B4 and B5 - IDS Calculations.

External and Through Trips

Traffic counts were taken at all major roads at the entrance of the planning area. The 1991 external-internal trips were distributed to internal zones by use of the gravity model program using trip productions at the stations, which are actual ground counts; attraction factors resulting from the multiple regression analysis; development trends; and the Fratar Trip balancing program. The total external-internal were trip productions at the external stations. This analysis estimated that there were 20,761 external-internal trips and 18,304 through trip crossings for and average weekday in 1991. The internal zones attracted these trips based on the regression equations.

Trip Distribution

The gravity model was used to distribute the internal trips (HBW, OHB, & NHB) and the E-I travel while the through travel was assigned directly to the road network on a minimum path basis. The friction factors by trip purpose as required by the gravity model were from the 1991 Hendersonville Study. (North Carolina has gained experience, since the Sixties, in travel modelling that with confidence travel parameters from similar urban area data bases can be borrowed and calibrated to a new urban area.) The friction factors are given in Table B8. The synthetic method of developing travel patterns was checked by comparing the assignment of the travel on the existing highway system to actual ground counts at established locations. The results of the accuracy checks (mentioned earlier as screenline checks) were felt to be within acceptable limits for the purpose of this study.

Future Travel

After travel forecast models have been calibrated so that they adequately duplicate travel, design year travel estimates are produced through the input of design year data on population and employment. The trip distribution models are sensitive to changes in the road network and variation will occur in the travel patterns as alternative road networks are tested.

The future year 2020 travel was developed using the same techniques employed in modelling the 1991 travel. The Planning Director and NCDOT working in cooperation with local interests developed the probable growth factors. The Planning Director projected the necessary housing and employment data. (See Table B2 and B4). The generation rates were developed using an equation that takes into consideration vehicle ownership trends, persons per household trends, and a vehicle usage factor. (See Table B1). The generation rates for commercially owned vehicles and taxis were held constant at 6.7 and 40 trips per vehicle, respectively. The commercially owned vehicles and taxis were estimated on a zonal basis using employment growth. The attraction factors were developed and calibrated using 1991 data and 2020 housing and employment data. The secondary NHB trips were developed using the 1991 ratio of secondary NHB trips per external-internal crossings by vehicles garaged outside the planning area times the estimated

2020 external-internal crossings by vehicles garaged outside the planning area. The 2020 secondary NHB trips were estimated at 15,500. The 2020 productions for HBW, OHB, NHB purposes were estimated using the same IDS program used for 1991. A growth rate analysis using historic travel trends and development potential was used to estimate traffic volumes at each external station for 2020. These volumes were converted to E-I and through trips. Through trips were distributed using the Fratar trip end balancing program. The HBW, OHB, NHB, and E-I trips were distributed using the same gravity model procedures employed in the base year.

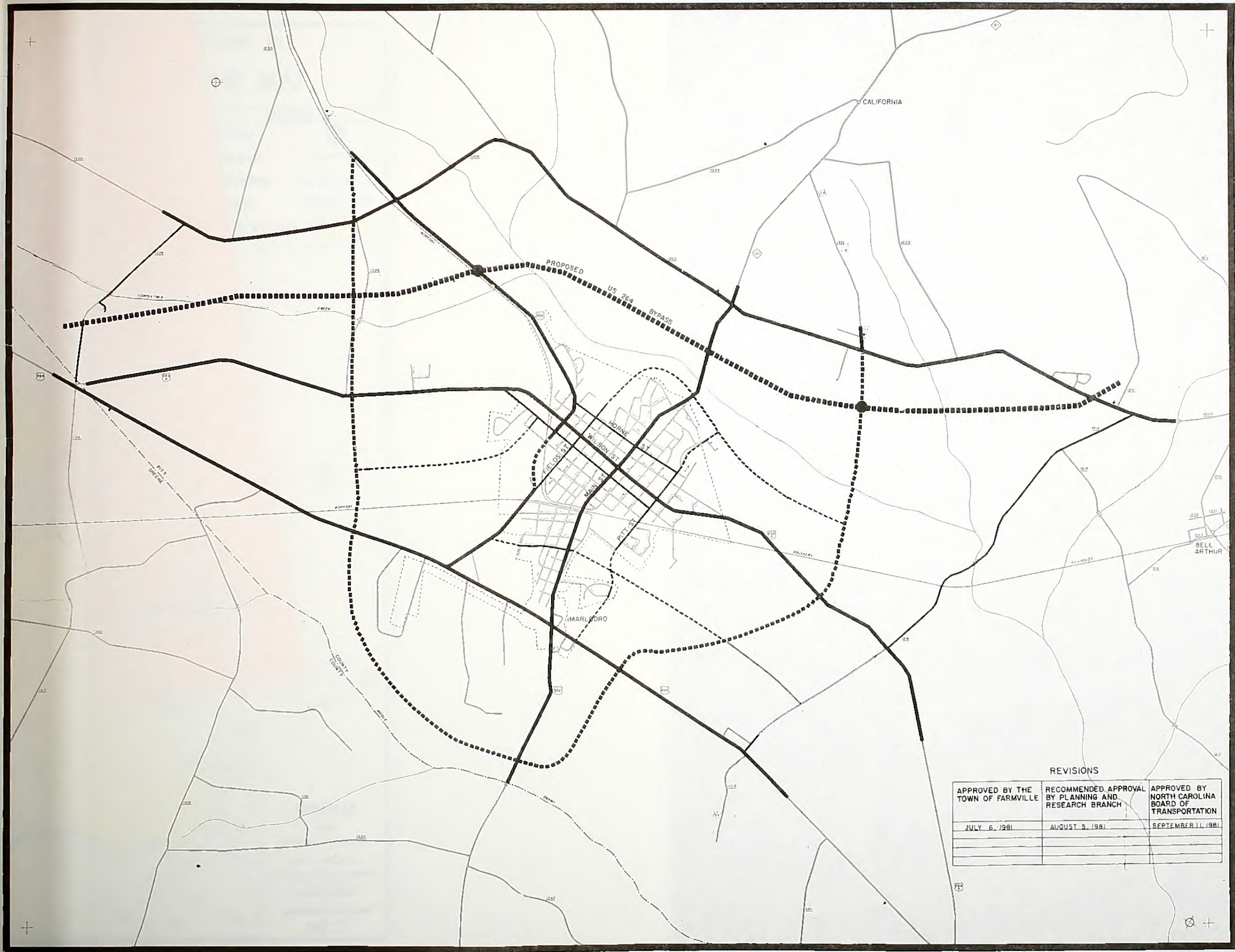


FIGURE B1
1979 THOROUGHFARE PLAN

ADOPTED BY TOWN OF FARMVILLE AUG 7, 1979

RECOMMENDED APPROVAL BY PLANNING AND RESEARCH BRANCH AUG 14, 1979

ADOPTED BY BOARD OF TRANSPORTATION OCT. 12, 1979

PUBLIC HEARING DATE AUG. 7, 1979

MAJOR THOROUGHFARES	EXISTING	PROPOSED	LONG RANGE
FREEWAYS			
OTHER			
MINOR THOROUGHFARES			
INTERCHANGE	●		

N

S

JUNE 27, 1979

FARMVILLE

REVISIONS

APPROVED BY THE TOWN OF FARMVILLE	RECOMMENDED APPROVAL BY PLANNING AND RESEARCH BRANCH	APPROVED BY NORTH CAROLINA BOARD OF TRANSPORTATION
JULY 6, 1981	AUGUST 5, 1981	SEPTEMBER 11, 1981

FIGURE B2

ZONE MAP

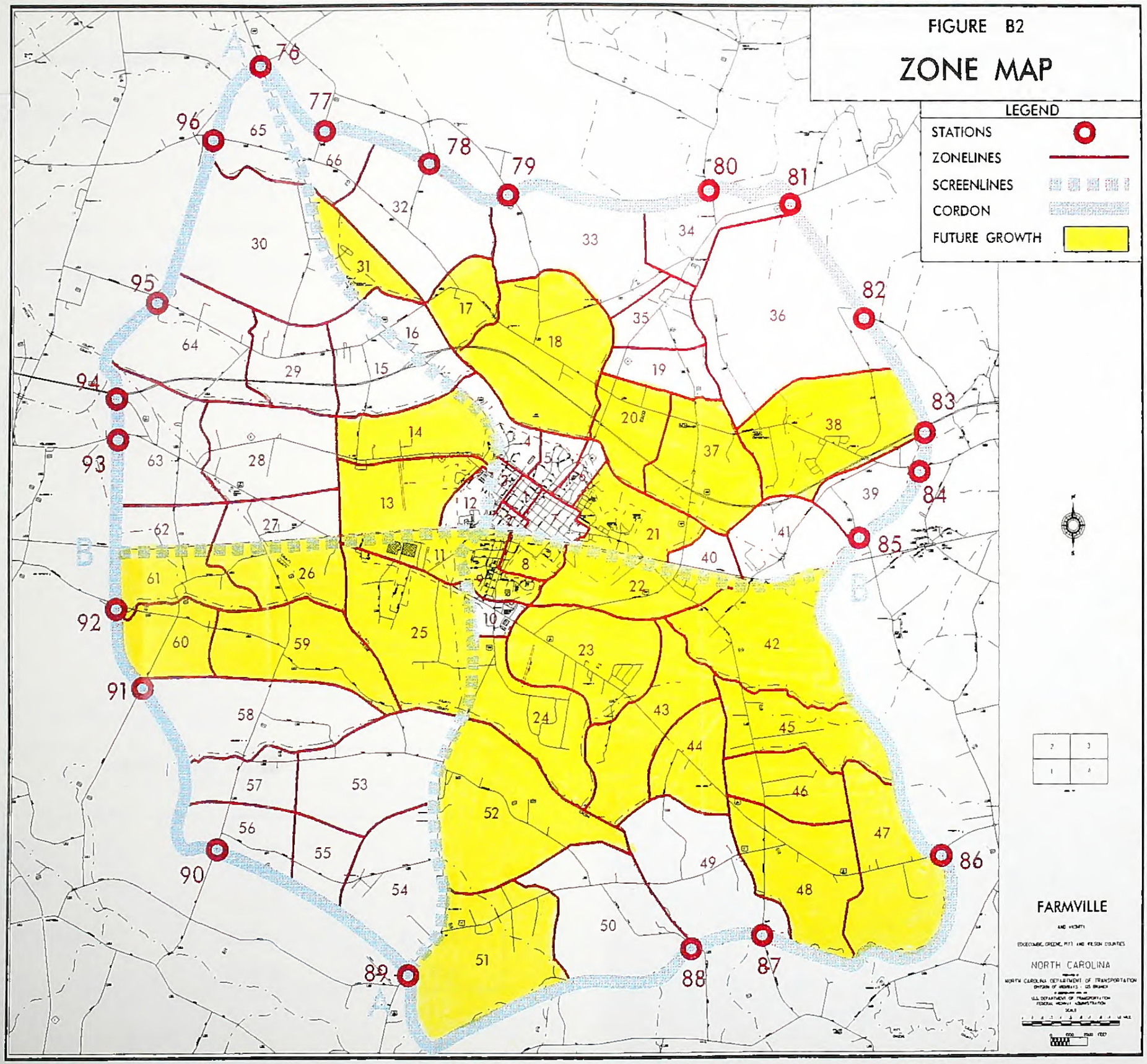


TABLE B1
TRAVEL MODEL INPUT VARIABLES

Trip Percentages by Purpose
Internal of Total 82%
HBW 23%
OHB 55%
NHB 22%

Year	Person per Vehicle	Persons per Dwelling Unit
1991	1.52	2.43
2020	1.26	2.25

Calculation of Increase in Trip Generation Rates:

$$\text{Composite Factor} = \frac{\text{1991 Persons/Vehicle}}{\text{2020 Persons/Vehicle}} \times \text{Usage Factor} \times \frac{\text{2020 Person/DU}}{\text{1991 Person/DU}}$$

$$= \frac{1.52}{1.26} \times 0.99 \times \frac{2.25}{2.43}$$

$$= 1.11$$

$$\text{Increase for Generation Rates} = \text{Average 1991 Trip Rate} \times \text{Composite Factor} - \text{Average 1991 Trip Rate}$$

$$= (7.27 \times 1.11) - 7.27$$

$$= 0.7693 \quad \text{(use 0.80)}$$

Trip Generation Rates:

Year	Excellent	Above Average	Average	Below Average	Poor	Overall Average
1991	12.00	10.00	8.00	7.00	5.00	* 7.27
Increase	0.80	0.80	0.80	0.80	0.80	----
2020	12.80	10.80	8.80	7.80	5.80	* 8.28

* Calculated by IDS Computer Program

TRAVEL DATA SUMMARY		
Type	1991	2020
Internal Trips		
Home Based Work	4,982	7,143
Other Home Based	11,912	17,081
Non-Home Based, internal	4,765	6,833
NHB secondary	6,400	15,500
Internal <-> External	20,761	45,488
Through Trips	18,304	50,652

TABLE B2 - SOCIOECONOMIC INPUT DATA

Farmville, NC — **1991 Housing Summary**

ZONE	EXC	AAV	AVE	BAV	POOR	TOTDU
1	6	6	51	26	0	89
2	0	0	15	135	25	175
3	0	1	14	28	3	46
4	3	24	39	0	0	66
5	4	44	69	48	3	168
6	4	14	56	14	0	88
7	0	12	164	218	9	403
8	2	8	88	90	13	201
9	0	0	19	420	57	496
10	0	0	1	22	3	26
11	0	0	8	0	0	8
12	0	0	0	0	0	0
13	5	42	77	6	0	130
14	10	8	40	5	2	65
15	0	0	6	49	4	59
16	0	0	0	49	8	57
17	0	0	5	24	0	29
18	2	23	20	23	5	73
19	0	0	2	4	1	7
20	0	5	9	21	0	35
21	9	13	22	16	2	62
22	0	2	2	19	0	23
23	0	0	23	83	2	108
24	0	5	20	9	0	34
25	0	5	55	103	3	166
26	0	3	5	6	0	14
27	0	0	3	8	2	13
28	0	5	24	10	7	46
29	0	0	7	8	1	16
30	0	0	5	4	0	9
31	0	0	10	40	2	52
32	0	1	5	11	2	19
33	0	0	5	2	3	10
34	0	0	10	25	3	38
35	0	0	37	50	1	88
36	0	0	25	8	1	34
37	0	0	20	61	7	88
38	0	0	20	135	0	155
39	0	0	5	13	0	18
40	0	0	10	0	0	10
41	0	0	5	0	2	7
42	0	0	12	12	4	28
43	0	5	11	18	5	39
44	0	2	5	21	0	28
45	0	1	5	2	6	14
46	0	1	5	56	0	62
47	0	5	5	9	7	26
48	0	0	6	8	6	20
49	1	1	5	3	4	14
50	0	1	10	22	6	39

TABLE B2 - SOCIOECONOMIC INPUT DATA

Farmville, NC **1991 Housing Summary**

ZONE	EXC	AAV	AVE	BAV	POOR	TOTDU
51	0	5	35	50	1	91
52	0	5	10	56	5	76
53	0	2	10	9	1	22
54	0	0	3	8	0	11
55	0	1	1	1	0	3
56	0	1	3	4	0	8
57	0	2	15	6	0	23
58	0	0	8	8	3	19
59	0	0	4	8	2	14
60	0	2	10	19	5	36
61	0	0	3	15	1	19
62	0	0	6	8	0	14
63	0	0	6	24	0	30
64	0	0	5	8	0	13
65	0	0	2	1	0	3
66	0	0	4	12	2	18
TOTALS	46	255	1190	2181	229	3901

TABLE B3 - SOCIOECONOMIC INPUT DATA

Farmville, NC — **2020 Housing Summary**

ZONE	EXC	AAV	AVE	BAV	POOR	TOTDU
1	6	6	51	26	0	89
2	0	0	15	135	25	175
3	0	1	14	28	3	46
4	3	24	39	0	0	66
5	4	46	72	50	3	175
6	4	14	56	14	0	88
7	0	12	164	218	9	403
8	2	8	91	94	14	209
9	0	0	20	427	58	505
10	0	0	1	22	3	26
11	0	0	10	0	0	10
12	0	0	0	0	0	0
13	5	45	83	7	0	140
14	11	9	43	5	2	70
15	0	0	6	49	4	59
16	0	0	0	49	8	57
17	0	0	5	26	0	31
18	2	25	22	25	6	80
19	0	0	2	4	1	7
20	0	6	10	23	0	39
21	10	14	24	17	2	67
22	0	2	2	22	0	26
23	0	0	23	83	2	108
24	0	5	21	9	0	35
25	0	5	56	105	3	169
26	0	3	5	6	0	14
27	0	0	3	8	2	13
28	0	5	24	10	7	46
29	0	0	7	8	1	16
30	0	0	5	4	0	9
31	0	0	10	40	2	52
32	0	1	5	11	2	19
33	0	0	5	2	3	10
34	0	0	10	25	3	38
35	0	0	37	50	1	88
36	0	0	25	8	1	34
37	0	0	22	66	8	96
38	0	0	20	138	0	158
39	0	0	5	13	0	18
40	0	0	10	0	0	10
41	0	0	5	0	2	7
42	2	5	13	13	5	38
43	2	5	11	18	5	41
44	2	5	5	21	0	33
45	2	3	5	2	6	18
46	1	3	25	56	0	85
47	2	5	15	9	8	39
48	0	0	16	9	6	31
49	1	1	5	3	4	14
50	0	1	10	22	6	39

TABLE B3 - SOCIOECONOMIC INPUT DATA						
Farmville, NC				**2020 Housing Summary**		
ZONE	EXC	AAV	AVE	BAV	POOR	TOTDU
51	0	5	35	50	1	91
52	0	5	10	56	5	76
53	0	2	10	9	1	22
54	0	0	6	8	0	14
55	0	1	3	1	0	5
56	0	1	6	4	0	11
57	0	2	15	6	0	23
58	0	0	10	8	3	21
59	0	0	8	8	2	18
60	0	2	15	19	5	41
61	0	0	6	15	1	22
62	0	0	10	8	0	18
63	0	0	6	24	0	30
64	0	0	5	8	0	13
65	0	0	2	1	0	3
66	0	0	4	12	2	18
TOTALS	59	277	1284	2217	235	4072

TABLE B4 - EMPLOYMENT INPUT DATA

Farmville, NC — **1991 Employment Summary**

ZONE	INDUSTRY SIC 1-49	RETAIL 50-54, 56,57,59	HIGHWAY RETAIL 55,58	OFFICE 60-67, 91-97	SERVICE 70-76, 78-89,99	TOTAL EMPLO	GARAGED PLANNING TRUCK	INSIDE AREA CAR
1	3	24	27	0	10	64	10	0
2	0	8	19	0	13	40	5	1
3	64	11	6	3	9	93	36	7
4	0	0	0	0	8	8	1	0
5	0	2	0	0	8	10	0	1
6	0	0	5	0	0	5	1	0
7	29	123	28	84	128	392	46	35
8	2	1	0	0	9	12	1	5
9	303	0	5	0	75	383	48	7
10	16	78	33	10	19	156	12	4
11	1455	52	12	10	0	1529	108	57
12	494	3	3	0	0	500	33	3
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	1	1
16	0	0	0	0	4	4	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	7	2	2	0	0	11	5	0
21	2	0	0	0	213	215	48	1
22	0	0	0	0	0	0	0	0
23	20	0	0	0	0	20	2	1
24	6	0	0	0	13	19	5	2
25	206	5	33	0	0	244	51	41
26	0	0	0	0	3	3	1	0
27	37	6	0	0	0	43	8	4
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0

Farmville, NC 1991 Employment Summary

Farmville, NC **1991 Employment Summary**

ZONE	INDUSTRY SIC 1-49	RETAIL 50-54, 56,57,59	HIGHWAY RETAIL 55,58	OFFICE 60-67, 91-97	SERVICE 70-76, 78-89,99	TOTAL EMPLO	GARAGED PLANNING TRUCK	INSIDE AREA CAR
34	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0
37	0	10	12	3	10	35	2	4
38	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0
43	100	0	0	0	0	100	5	2
44	6	0	0	0	0	6	4	2
45	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0
63	16	0	2	0	0	18	4	1
64	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0
TOTALS	2766	325	187	110	522	3910	437	179

TABLE B5 - EMPLOYMENT INPUT DATA

Farmville, NC — **2020 Employment Summary**

ZONE	INDUSTRY SIC 1-49	RETAIL 50-54, 56,57,59	HIGHWAY RETAIL 55,58	OFFICE 60-67, 91-97	SERVICE 70-76, 78-89,99	TOTAL EMPLO	GARAGED PLANNING TRUCK	GARAGED INSIDE AREA CAR
1	3	24	27	0	10	64	10	0
2	0	8	19	0	13	40	5	1
3	64	11	6	3	9	93	36	7
4	0	0	0	0	8	8	1	0
5	0	2	0	0	8	10	0	1
6	0	0	5	0	0	5	1	0
7	29	123	28	84	128	392	47	35
8	2	1	0	0	9	12	1	5
9	303	0	5	0	75	383	48	7
10	16	78	33	10	19	156	13	4
11	1455	52	12	10	0	1529	108	57
12	494	3	3	0	0	500	33	3
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	1	1
16	0	0	0	0	4	4	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	7	2	2	0	0	11	5	0
21	2	0	0	0	213	215	48	1
22	0	0	0	0	0	0	0	0
23	20	0	0	0	0	20	2	1
24	6	0	0	0	13	19	5	2
25	206	5	33	0	0	244	51	41
26	0	0	0	0	3	3	1	0
27	37	6	0	0	0	43	8	4
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0

Farmville, NC 2020 Employment Summary

Farmville, NC **2020 Employment Summary**

ZONE	INDUSTRY SIC 1-49	RETAIL 50-54, 56,57,59	HIGHWAY RETAIL 55,58	OFFICE 60-67, 91-97	SERVICE 70-76, 78-89,99	TOTAL EMPLO	GARAGED INSIDE PLANNING AREA TRUCK	CAR
34	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0
37	0	10	12	3	10	35	3	5
38	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0
43	100	0	0	0	0	100	6	3
44	6	0	0	0	0	6	4	2
45	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0
63	16	0	2	0	0	18	4	1
64	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0
TOTALS	2766	325	187	110	522	3910	441	181

TABLE B6 - 1991 IDS CALCULATIONS

ZN	HBWAF	OAF	NAF	EAF	TOTTRP	INTTRP	HBWTRP	OHBTRP	NHBTRP	NHBSEC	EXTRPP	HBWAT	OHBAT	NHBAT	EXTRPA
1	64	342	307	432	789	647	149	356	142		0	91	651	552	842
2	38	296	222	481	1280	1050	242	578	231		0	54	564	399	938
3	93	161	171	249	671	550	127	303	121		0	132	307	307	485
4	8	48	26	104	505	414	95	228	91		0	11	91	47	203
5	10	90	37	221	1085	890	205	490	196		0	14	171	67	431
6	5	86	51	174	741	608	140	334	134		0	7	164	92	339
7	374	1176	1028	1593	3519	2886	664	1587	635		0	532	2239	1848	3106
8	12	106	43	267	1219	1000	230	550	220		0	17	202	77	521
9	376	595	564	1202	3456	2834	652	1559	623		0	535	1133	1014	2343
10	126	426	424	460	264	216	50	119	48		0	179	811	762	897
11	1529	949	1676	1676	1106	907	209	499	200		0	2175	1807	3013	3267
12	500	277	524	524	241	198	46	109	44		0	711	527	942	1022
13	0	33	7	98	558	458	105	252	101		0	0	63	13	191
14	0	16	3	48	274	225	52	124	49		0	0	30	5	94
15	0	29	6	86	395	324	75	178	71		0	0	55	11	168
16	4	39	16	96	383	314	72	173	69		0	6	74	29	187
17	0	9	2	26	119	98	23	54	22		0	0	17	4	51
18	0	16	3	48	257	211	49	116	46		0	0	30	5	94
19	0	3	1	8	33	27	6	15	6		0	0	6	2	16
20	11	32	29	48	128	105	24	58	23		0	16	61	52	94
21	196	516	501	556	634	520	120	286	114		0	279	983	901	1084
22	0	6	1	17	81	66	15	36	15		0	0	11	2	33
23	20	52	28	146	607	498	115	274	110		0	28	99	50	285
24	19	39	40	47	81	66	15	36	15		0	27	74	72	92
25	48	366	310	523	1212	994	229	547	219		0	68	697	557	1020
26	3	14	9	26	99	81	19	45	18		0	4	27	16	51
27	43	37	49	68	171	140	32	77	31		0	61	70	88	133
28	0	11	2	32	137	112	26	62	25		0	0	21	4	62
29	0	6	1	17	77	63	14	35	14		0	0	11	2	33
30	0	3	1	9	44	36	8	20	8		0	0	6	2	18
31	0	22	4	65	301	247	57	136	54		0	0	42	7	127
32	0	8	2	24	113	93	21	51	20		0	0	15	4	47
33	0	3	1	8	29	24	6	13	5		0	0	6	2	16
34	0	16	3	48	222	182	42	100	40		0	0	30	5	94
35	0	34	7	102	491	403	93	222	89		0	0	65	13	199
36	0	6	1	18	85	70	16	39	15		0	0	11	2	35
37	0	26	5	77	365	299	69	164	66		0	0	50	9	150

1991 IDS CALCULATIONS

1991 IDS CALCULATIONS

ZN	HBWAF	OAF	NAF	EAF	TOTTRP	INTTRP	HBWTRP	OHBTRP	NHBTRP	NHBSEC	EXTRPP	HBWAT	OHBAT	NHBAT	EXTRPA
38	0	65	13	194	912	748	172	411	165		0	0	124	23	378
39	0	8	2	24	115	94	22	52	21		0	0	15	4	47
40	0	0	0	0	0	0	0	0	0		0	0	0	0	0
41	0	1	0	3	10	8	2	4	2		0	0	2	0	6
42	0	6	1	18	79	65	15	36	14		0	0	11	2	35
43	0	10	2	30	133	109	25	60	24		0	0	19	4	58
44	6	12	8	32	159	130	30	72	29		0	9	23	14	62
45	0	2	0	6	22	18	4	10	4		0	0	4	0	12
46	0	27	5	81	380	312	72	172	69		0	0	51	9	158
47	0	9	2	26	115	94	22	52	21		0	0	17	4	51
48	0	10	2	29	118	97	22	53	21		0	0	19	4	57
49	0	6	1	17	79	65	15	36	14		0	0	11	2	33
50	0	16	3	47	208	171	39	94	38		0	0	30	5	92
51	0	35	7	104	502	412	95	227	91		0	0	67	13	203
52	0	31	6	93	432	354	81	195	78		0	0	59	11	181
53	0	7	1	21	100	82	19	45	18		0	0	13	2	41
54	0	4	1	12	56	46	11	25	10		0	0	8	2	23
55	0	1	0	2	7	6	1	3	1		0	0	2	0	4
56	0	3	1	9	44	36	8	20	8		0	0	6	2	18
57	0	8	2	23	116	95	22	52	21		0	0	15	4	45
58	0	9	2	26	119	98	23	54	22		0	0	17	4	51
59	0	6	1	17	74	61	14	34	13		0	0	11	2	33
60	0	16	3	48	224	184	42	101	40		0	0	30	5	94
61	0	9	2	26	118	97	22	53	21		0	0	17	4	51
62	0	6	1	17	80	66	15	36	15		0	0	11	2	33
63	18	40	36	78	250	205	47	113	45		0	26	76	65	152
64	0	5	1	14	64	52	12	29	11		0	0	10	2	27
65	0	1	0	2	7	6	1	3	1		0	0	2	0	4
66	0	9	2	26	118	97	22	53	21		0	0	17	4	51
67	0	0	0	0	0	0	0	0	0		0	0	0	0	0
68	0	0	0	0	0	0	0	0	0		0	0	0	0	0
69	0	0	0	0	0	0	0	0	0		0	0	0	0	0
70	0	0	0	0	0	0	0	0	0		0	0	0	0	0
71	0	0	0	0	0	0	0	0	0		0	0	0	0	0
72	0	0	0	0	0	0	0	0	0		0	0	0	0	0
73	0	0	0	0	0	0	0	0	0		0	0	0	0	0
74	0	0	0	0	0	0	0	0	0		0	0	0	0	0

1991 IDS CALCULATIONS

ZN	HBWAF	OAF	NAF	EAF	TOTTRP	INTTRP	HBWTRP	OHBTRP	NHBTRP	NHBSEC	EXTRPP	HBWAT	OHBAT	NHBAT	EXTRPA
75	0	0	0	0	0	0	0	0	0		0	0	0	0	0
76	0	0	0	0	0	0	0	0	0		1654	0	0	0	0
77	0	0	0	0	0	0	0	0	0		109	0	0	0	0
78	0	0	0	0	0	0	0	0	0		68	0	0	0	0
79	0	0	0	0	0	0	0	0	0		115	0	0	0	0
80	0	0	0	0	0	0	0	0	0		597	0	0	0	0
81	0	0	0	0	0	0	0	0	0		808	0	0	0	0
82	0	0	0	0	0	0	0	0	0		35	0	0	0	0
83	0	0	0	0	0	0	0	0	0		4198	0	0	0	0
84	0	0	0	0	0	0	0	0	0		1592	0	0	0	0
85	0	0	0	0	0	0	0	0	0		459	0	0	0	0
86	0	0	0	0	0	0	0	0	0		1432	0	0	0	0
87	0	0	0	0	0	0	0	0	0		638	0	0	0	0
88	0	0	0	0	0	0	0	0	0		95	0	0	0	0
89	0	0	0	0	0	0	0	0	0		3718	0	0	0	0
90	0	0	0	0	0	0	0	0	0		90	0	0	0	0
91	0	0	0	0	0	0	0	0	0		61	0	0	0	0
92	0	0	0	0	0	0	0	0	0		311	0	0	0	0
93	0	0	0	0	0	0	0	0	0		2276	0	0	0	0
94	0	0	0	0	0	0	0	0	0		2026	0	0	0	0
95	0	0	0	0	0	0	0	0	0		411	0	0	0	0
96	0	0	0	0	0	0	0	0	0		68	0	0	0	0
97	0	0	0	0	0	0	0	0	0		0	0	0	0	0
98	0	0	0	0	0	0	0	0	0		0	0	0	0	0
99	0	0	0	0	0	0	0	0	0		0	0	0	0	0
100	0	0	0	0	0	0	0	0	0		0	0	0	0	0
101	0	0	0	0	0	0	0	0	0		0	0	0	0	0
102	0	0	0	0	0	0	0	0	0		0	0	0	0	0
103	0	0	0	0	0	0	0	0	0		0	0	0	0	0
104	0	0	0	0	0	0	0	0	0		0	0	0	0	0
105	0	0	0	0	0	0	0	0	0		0	0	0	0	0
	3503	6256	6210	10649	26413	21659	4982	11912	4765	6400	20761	4982	11908	11170	20768

NOTES FOR 1991 CALCULATIONS

NOTES FOR 1991 CALCULATIONS

AVERAGE DU GENERATION RATE = 7.27 Trips/DU
(Only includes 5 standard housing class)

EMPLOYEE/POPULATION RATIO = .46 EMP/PER
Allowable Ranges for Employee/Population Ratio

EMP/POP	INT OF TOTAL
40-50%	80-85%
50-60%	85-90%

TOTAL NHBS trips = 6400
(Your NHBS trips should be between 5059 and 8431)

INTERNAL TRIPS

Total Internal Trips = 21659
HBW trips = 4982
NHB Trips = 4765
OHB Trips = 11912
External Trips = 20761

2020 IDS CALCULATIONS

ZN	HBWAF	OAF	NAF	EAF	TOTTRP	INTTRP	HBWTRP	OHBTRP	NHBTRP	NHBSEC	EXTRPP	HBWAT	OHBAT	NHBAT	EXTRPA
1	64	342	307	432	861	706	162	388	155		0	117	810	986	1552
2	40	295	225	470	1370	1123	258	618	247		0	73	699	723	1688
3	93	156	170	234	657	539	124	296	119		0	170	370	546	841
4	8	53	27	119	647	531	122	292	117		0	15	126	87	427
5	10	112	42	287	1596	1309	301	720	288		0	18	265	135	1031
6	5	86	51	174	811	665	153	366	146		0	9	204	164	625
7	392	1220	1072	1637	3874	3177	731	1747	699		0	716	2890	3444	5880
8	12	131	48	341	1767	1449	333	797	319		0	22	310	154	1225
9	383	638	587	1294	4212	3454	794	1900	760		0	700	1511	1886	4648
10	156	514	512	548	312	256	59	141	56		0	285	1218	1645	1969
11	1529	954	1677	1691	1194	979	225	538	215		0	2793	2260	5387	6074
12	500	277	524	524	241	198	46	109	44		0	913	656	1683	1882
13	0	70	14	210	1335	1095	252	602	241		0	0	166	45	754
14	0	35	7	105	667	547	126	301	120		0	0	83	22	377
15	0	30	6	89	472	387	89	213	85		0	0	71	19	320
16	4	39	16	96	428	351	81	193	77		0	7	92	51	345
17	0	16	3	47	247	203	47	112	45		0	0	38	10	169
18	0	40	8	120	720	590	136	325	130		0	0	95	26	431
19	0	4	1	11	55	45	10	25	10		0	0	9	3	40
20	11	45	32	87	365	299	69	164	66		0	20	107	103	313
21	215	578	552	646	964	790	182	435	174		0	393	1369	1773	2321
22	0	13	3	39	212	174	40	96	38		0	0	31	10	140
23	20	64	31	182	881	722	166	397	159		0	37	152	100	654
24	19	54	43	92	355	291	67	160	64		0	35	128	138	330
25	244	473	508	745	2000	1640	377	902	361		0	446	1120	1632	2676
26	3	15	9	29	130	107	25	59	24		0	5	36	29	104
27	43	37	49	68	181	148	34	81	33		0	79	88	157	244
28	0	23	5	69	384	315	72	173	69		0	0	54	16	248
29	0	8	2	24	130	107	25	59	24		0	0	19	6	86
30	0	5	1	14	75	61	14	34	13		0	0	12	3	50
31	0	26	5	78	412	338	78	186	74		0	0	62	16	280
32	0	10	2	29	153	125	29	69	27		0	0	24	6	104
33	0	5	1	15	77	63	14	35	14		0	0	12	3	54
34	0	19	4	57	300	246	57	135	54		0	0	45	13	205
35	0	44	9	132	722	592	136	326	130		0	0	104	29	474
36	0	17	3	51	288	236	54	130	52		0	0	40	10	183
37	35	199	161	295	808	663	152	365	146		0	64	471	517	1060

2020 IDS CALCULATIONS

ZN	HBWAF	OAF	NAF	EAF	TOTTRP	INTTRP	HBWTRP	OHBTRP	NHBTRP	NHBSEC	EXTRPP	HBWAT	OHBAT	NHBAT	EXTRPA
38	0	79	16	237	1252	1027	236	565	226		0	0	187	51	851
39	0	9	2	27	145	119	27	65	26		0	0	21	6	97
40	0	5	1	15	88	72	17	40	16		0	0	12	3	54
41	0	4	1	11	56	46	11	25	10		0	0	9	3	40
42	0	19	4	57	324	266	61	146	59		0	0	45	13	205
43	100	71	104	162	406	333	77	183	73		0	183	168	334	582
44	6	20	9	56	328	269	62	148	59		0	11	47	29	201
45	0	9	2	27	153	125	29	69	27		0	0	21	6	97
46	0	43	9	128	702	576	132	317	127		0	0	102	29	460
47	0	20	4	59	328	269	62	148	59		0	0	47	13	212
48	0	16	3	47	246	202	46	111	44		0	0	38	10	169
49	0	7	1	21	114	93	21	51	20		0	0	17	3	75
50	0	20	4	59	306	251	58	138	55		0	0	47	13	212
51	0	46	9	137	758	622	143	342	137		0	0	109	29	492
52	0	38	8	114	608	499	115	274	110		0	0	90	26	410
53	0	11	2	33	186	153	35	84	34		0	0	26	6	119
54	0	7	1	21	115	94	22	52	21		0	0	17	3	75
55	0	3	1	8	45	37	9	20	8		0	0	7	3	29
56	0	6	1	17	95	78	18	43	17		0	0	14	3	61
57	0	12	2	35	201	165	38	91	36		0	0	28	6	126
58	0	11	2	32	167	137	32	75	30		0	0	26	6	115
59	0	9	2	27	144	118	27	65	26		0	0	21	6	97
60	0	21	4	62	331	271	62	149	60		0	0	50	13	223
61	0	11	2	33	176	144	33	79	32		0	0	26	6	119
62	0	9	2	27	150	123	28	68	27		0	0	21	6	97
63	18	40	36	78	274	225	52	124	49		0	33	95	116	280
64	0	7	1	20	106	87	20	48	19		0	0	17	3	72
65	0	2	0	5	26	21	5	12	5		0	0	5	0	18
66	0	9	2	27	141	116	27	64	26		0	0	21	6	97
67	0	0	0	0	0	0	0	0	0		0	0	0	0	0
68	0	0	0	0	0	0	0	0	0		0	0	0	0	0
69	0	0	0	0	0	0	0	0	0		0	0	0	0	0
70	0	0	0	0	0	0	0	0	0		0	0	0	0	0
71	0	0	0	0	0	0	0	0	0		0	0	0	0	0
72	0	0	0	0	0	0	0	0	0		0	0	0	0	0
73	0	0	0	0	0	0	0	0	0		0	0	0	0	0
74	0	0	0	0	0	0	0	0	0		0	0	0	0	0

2020 IDS CALCULATIONS

ZN	HBWAF	OAF	NAF	EAF	TOTTRP	INTTRP	HBWTRP	OHBTRP	NHBTRP	NHBSEC	EXTRPP	HBWAT	OHBAT	NHBAT	EXTRPA
75	0	0	0	0	0	0	0	0	0		0	0	0	0	0
76	0	0	0	0	0	0	0	0	0		3510	0	0	0	0
77	0	0	0	0	0	0	0	0	0		240	0	0	0	0
78	0	0	0	0	0	0	0	0	0		140	0	0	0	0
79	0	0	0	0	0	0	0	0	0		240	0	0	0	0
80	0	0	0	0	0	0	0	0	0		1260	0	0	0	0
81	0	0	0	0	0	0	0	0	0		1800	0	0	0	0
82	0	0	0	0	0	0	0	0	0		70	0	0	0	0
83	0	0	0	0	0	0	0	0	0		6040	0	0	0	0
84	0	0	0	0	0	0	0	0	0		3495	0	0	0	0
85	0	0	0	0	0	0	0	0	0		980	0	0	0	0
86	0	0	0	0	0	0	0	0	0		6510	0	0	0	0
87	0	0	0	0	0	0	0	0	0		1410	0	0	0	0
88	0	0	0	0	0	0	0	0	0		215	0	0	0	0
89	0	0	0	0	0	0	0	0	0		7960	0	0	0	0
90	0	0	0	0	0	0	0	0	0		205	0	0	0	0
91	0	0	0	0	0	0	0	0	0		140	0	0	0	0
92	0	0	0	0	0	0	0	0	0		655	0	0	0	0
93	0	0	0	0	0	0	0	0	0		4315	0	0	0	0
94	0	0	0	0	0	0	0	0	0		5290	0	0	0	0
95	0	0	0	0	0	0	0	0	0		873	0	0	0	0
96	0	0	0	0	0	0	0	0	0		140	0	0	0	0
97	0	0	0	0	0	0	0	0	0		0	0	0	0	0
98	0	0	0	0	0	0	0	0	0		0	0	0	0	0
99	0	0	0	0	0	0	0	0	0		0	0	0	0	0
100	0	0	0	0	0	0	0	0	0		0	0	0	0	0
101	0	0	0	0	0	0	0	0	0		0	0	0	0	0
102	0	0	0	0	0	0	0	0	0		0	0	0	0	0
103	0	0	0	0	0	0	0	0	0		0	0	0	0	0
104	0	0	0	0	0	0	0	0	0		0	0	0	0	0
105	0	0	0	0	0	0	0	0	0		0	0	0	0	0
	3910	7211	6952	12663	37874	31057	7143	17081	6833	15500	45488	7144	17081	22328	45489

NOTES FOR 2020 IDS CALCULATIONS

AVERAGE DU GENERATION RATE = 8.28 Trips/DU
(Only includes 5 standard housing class)

EMPLOYEE/POPULATION RATIO = .45 EMP/PER
Allowable Ranges for Employee/Population Ratio

EMP/POP	INT OF TOTAL
40-50%	80-85%
50-60%	85-90%

TOTAL NHBS trips = 15500
(Your NHBS trips should be between 11969 and 19949)

INTERNAL TRIPS

Total Internal Trips = 31057
HBW trips = 7143
NHB Trips = 6833
OHB Trips = 17081
External Trips = 45488

TABLE B8 - FRICTION FACTORS				
TIME INTERVAL	HBW	OHB	NHB	E-I
1	20000	17000	17000	19000
2	24800	18000	19800	20000
3	24000	20000	21600	18500
4	22400	23000	14000	11600
5	22200	24800	9200	8300
6	17600	25000	6200	5400
7	12800	20800	4900	3700
8	11700	14300	3900	2600
9	9600	10500	2300	1700
10	8000	7600	1900	1200
11	6400	5300	1000	700
12	4800	3700	800	500
13	4000	2500	500	300
14	3200	1700	200	250
15	2400	1100	100	150

APPENDIX C

GOALS AND OBJECTIVES SURVEY

1991 Goals and Objectives Survey

Of the one hundred and fifteen (115) surveys mailed to Farmville area businesses and residents, fifty (50) were returned. Respondents were asked to identify problem areas and concerns by rating each item with the following scale:

Not Important	Neutral	Important	Very Important	Most Important
(0)	(1)	(2)	(3)	(4)

The responses were tabulated, given an average value, and ranked as follows:

Rank	Value Factor	Average Value	Total Value
1	Traffic Safety	3.6	179
2	Road Maintenance	3.2	162
3	Special Truck Routes	3.1	155
4	School Travel (Access to and from)	3.1	154
5	Improvement of Transportation Routes to attract Industry	3.0	151
6	Air Pollution	3.0	150
7,8,9	Access to Central Business District	2.9	146
7,8,9	Recycling	2.9	146
7,8,9	Environmental Control/Preservation	2.9	146
10	Improvement of Traffic Flow at Intersections	2.8	141
11	Land Use Zoning	2.8	140
12	Access to Industrial and Commercial Centers	2.8	138
13	Parks, Playgrounds, & Sidewalks	2.7	133
14	Business District Parking	2.6	129
15	City Control over Subdivision of Land	2.5	124
16	Off road Loading Areas	2.4	118
17	Urban Renewal	2.3	117
18	Access to Residential Areas	2.3	115
19	Preservation of Historical Buildings	2.2	112
20	Limit Number of Commercial Signs along roadways	2.1	104
21	Home to Work Travel Time	2.1	103
22	Bicycle Travel	2.0	99
23	Rural District Parking	1.9	96
24	Neighborhood Travel Time	1.8	92
25	Scenic Byways	1.7	83
26	Taxi Service	1.5	74
27	Bus Transit	1.4	71
28	One Way Streets	0.6	30

A P P E N D I X D

C A P A C I T Y A N A L Y S I S

Capacity Analysis

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 that have a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given period under prevailing roadway and traffic conditions.[1] The relationship of traffic volumes to the capacity of the roadway will determine the **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 are illustrated in Figure D1, and they are defined on the following page. The definitions are general and conceptual in nature, but may be applied to urban arterial levels of service. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them. Each chapter of the 1985 Highway Capacity Manual contains more detailed descriptions of the levels of service as defined for each facility type.

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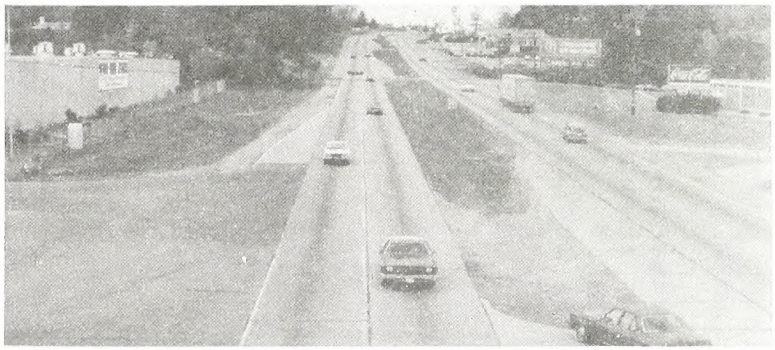
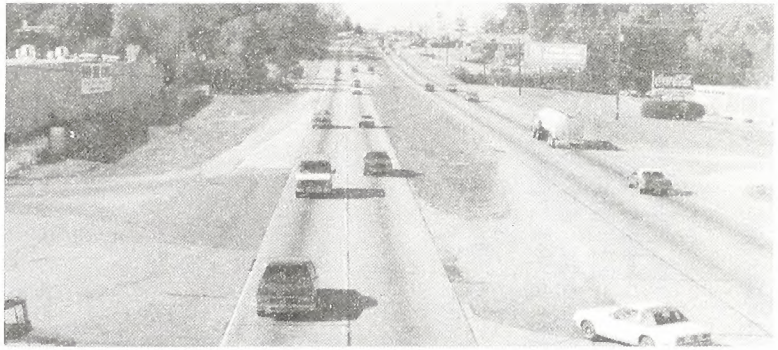
[1] Highway Capacity manual, Special Report 209, 1985, p. 1-3.



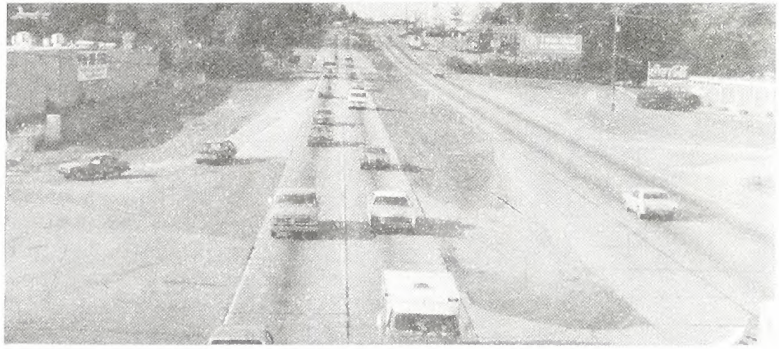
LEVEL OF SERVICE - A

LEVEL OF SERVICE - D



LEVEL OF SERVICE - B

LEVEL OF SERVICE - E



LEVEL OF SERVICE - C

LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE D1

1. **Level-of-service A** describes primarily free flow operations at average travel speeds, usually about 90 percent of the free flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.

2. **Level-of-service B** represents reasonable unimpeded operations at average travel speeds, usually about 70 percent of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.

3. **Level-of-service C** represents stable operations. However, ability to maneuver and change lanes in midblock locations may be more restricted than in LOS B, and longer queues and/or adverse signal coordinations may contribute to lower average travel speeds of about 50 percent of the average free flow speed for the arterial class. Motorists will experience an appreciable tension while driving.

4. **Level-of-service D** borders on a range on which small increases in flow may cause substantial increases in approach delay and, hence, decreases in arterial speed. They may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free flow speed.

5. **Level-of-service E** is characterized by significant approach delays and average travel speeds of one-third the free flow speed or lower. Such operations are caused by some combination of adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.

6. **Level-of-service F** characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is likely at critical signalized locations, with high approach delays resulting. Adverse progression is frequently a contributor to this condition.

APPENDIX E

DESIGN REQUIREMENTS

Typical Cross Sections

Typical cross sections recommended by the Thoroughfare Planning Branch are shown in Figure E1, and listed in Table A1.

Cross section "A" is illustrative for controlled access freeways. The 46 foot grassed median is the minimum median width. Wider variations could result 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.

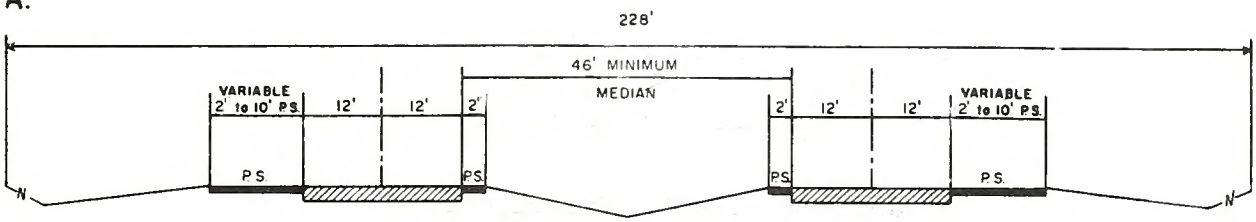
Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane probably would be required at major intersections.

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.

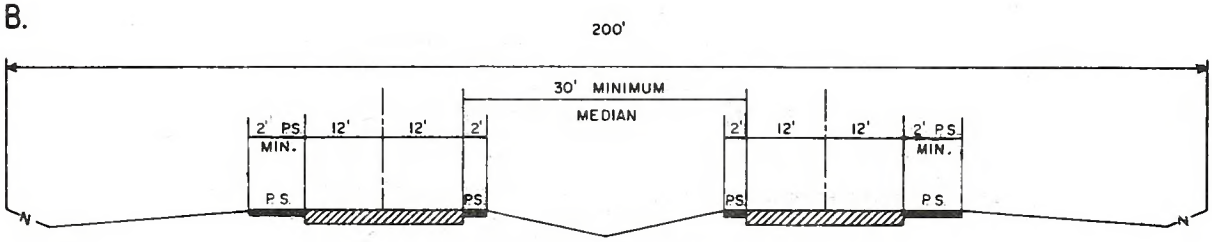
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



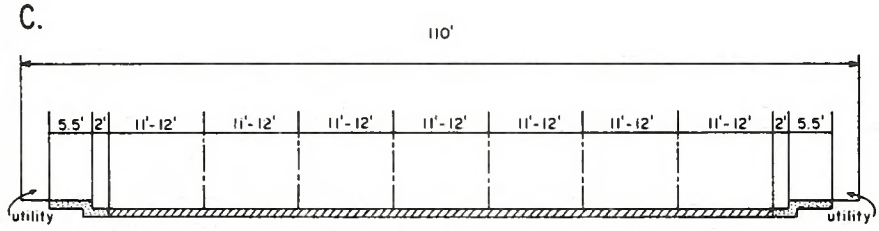
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



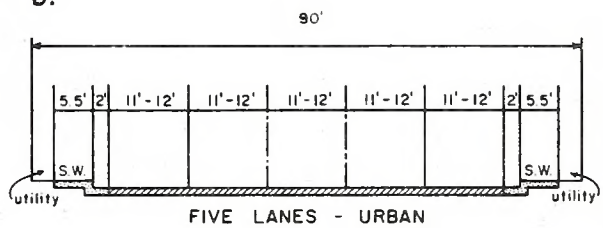
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



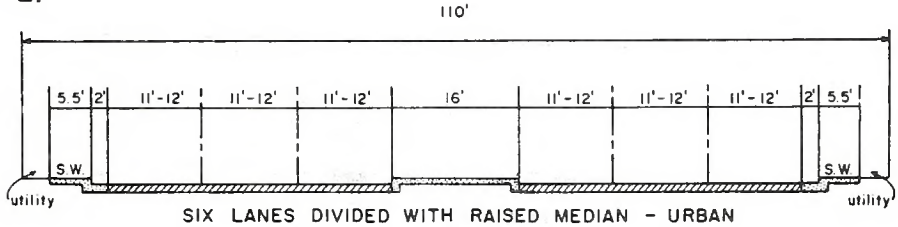
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

E.

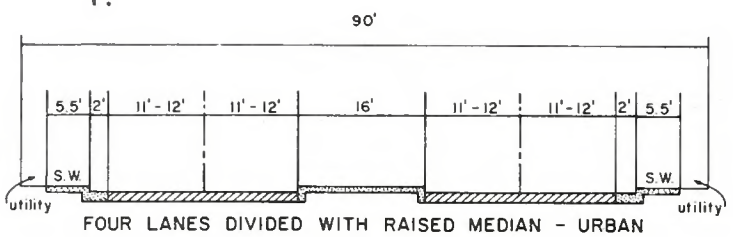


SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

FIGURE E1

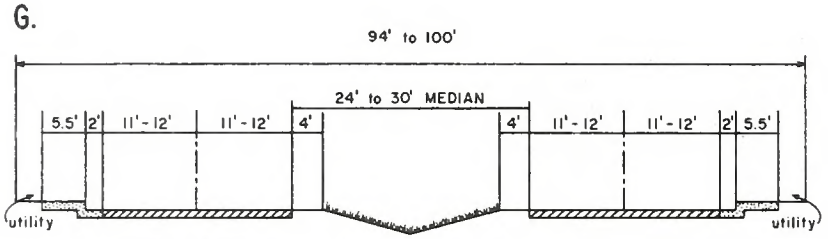
TYPICAL THOROUGHFARE CROSS SECTIONS
(CONTINUED)

F.



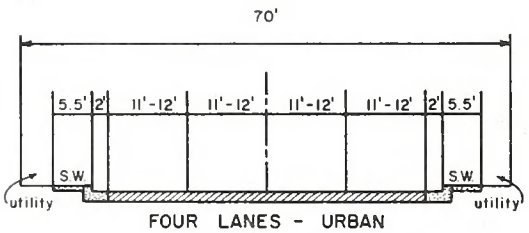
FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



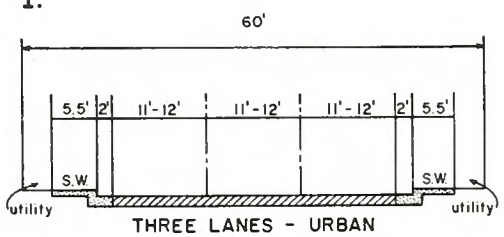
FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



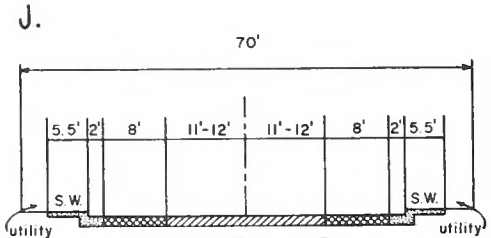
FOUR LANES - URBAN

I.



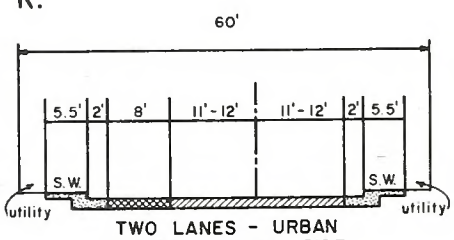
THREE LANES - URBAN

J.



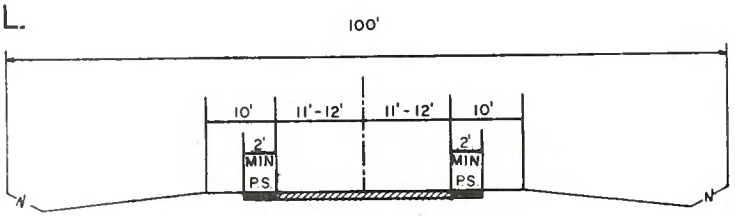
TWO LANES - URBAN
PARKING ON EACH SIDE

K.



TWO LANES - URBAN
PARKING ON ONE SIDE

L.



TWO LANES - RURAL

The curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk 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.

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, intrastate routes, and other routes designated as principal arterials.

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

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

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

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

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of interstate, intrastate, 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 roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles with no direct access to abutting property and with access to selected

crossroads only by way of interchanges. (Design speed 70 mph, Operating speed 55 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 noncommercial 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 left 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 built.

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 or 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 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 or 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 the Farmville Urban Area will 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 Farmville.

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 in the Thoroughfare Plan.

	Minimum ROW
1. Rural	
a. Principal 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. In all cases in which right-of-way is sought for a fully controlled

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[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 turn-around. Distance from edge of pavement of turn-around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn-around.

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, principal 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 streets shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

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 are shown on the following page.

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*	40*
Urban			
Major Thoroughfares other than Freeways, Expressways, or Parkways	60	50	50
Minor Thoroughfares	60	50	40
Local Streets	40	40**	30**

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%.

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* 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.

**Based on projected annual average daily traffic of 50-250.

d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 50% greater than the value in the above table.

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum applicable sight distance shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1984."

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* 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.)

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 is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

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* 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.

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 sixty-five (65) degrees.

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

3. Offset intersections are to be avoided. Intersections 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 made 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. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn-around facilities at the dead end 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. Wheelchair 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 of rails.

b. Curb 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 of 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.