

**A COMPREHENSIVE
WATER AND SEWER REPORT
FOR
APPOMATTOX COUNTY
VIRGINIA**



PREPARED BY

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RICHMOND, VIRGINIA

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Town of Appomattox

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SUMMARY

I. SUMMARY

Appomattox County lies in the hill-country of the Piedmont Plateau in south-central Virginia. The County was formed in 1845 from portions of Buckingham, Prince Edward, Charlotte and Campbell Counties. Although its name is believed to have originated with an Indian tribe, this has never been verified. Ground elevations in the central portion of the County vary between 700 and 850 above sea level. Extremes in elevation vary from a low of 380 at Bent Creek to a high of 1145 at Piney Mountain.

The County seat is the Town of Appomattox which had a population of 1400 in 1970. The population of the County was 9784 in 1970 - up 7 per cent from 1960. Mild growth is predicted for the County during the next several decades. Population of the County is expected to be 11,600 by 1990 and over 16,000 by the year 2020. Most of the growth is expected to take place in the Southside District adjacent to the Town of Appomattox which is rapidly becoming urbanized. Pamplin City, the County's only other incorporated town, is located near the juncture of Route 460 and the Appomattox-Prince Edward line.

Until recently agriculture has always been the predominant industry. Manufacturing now employs over 800 persons and has replaced agriculture as the largest employer in the County. Manufacturing operations include dress factories, saw mills and wood products.

The soil is composed mostly of loam types, and tobacco is the chief crop although dairy products and livestock now run a close second. The number

of farms has decreased in number from 999 in 1950 to approximately 550 today. A further decrease in the number of farms is expected in the future. About half of the existing farms are operated on a part-time basis. Many of those who live on farms are employed in manufacturing plants in the Lynchburg area.

The Town of Appomattox has the only existing public water and sewer systems in Appomattox County. Both the water distribution system and the sewage collection system are adequate for the population which they serve within the corporate limits of the Town. Water is supplied to the distribution system by three deep wells supplemented by two elevated storage tanks, one of 100,000 gallons capacity and another of 30,000 gallons capacity. Sewage from the Town is treated by a trickling filter plant which was constructed in 1964. Both of the sewage treatment plants are somewhat overloaded.

Pamplin City has two privately owned water systems which supply approximately one-third of the Town's population. Neither of these systems meet the minimum standards of the Virginia State Health Department. Pamplin has no sewage collection or treatment systems.

Since the proposed growth within the County is expected to occur in the vicinity of Appomattox, it is proposed that Town utilities be extended to provide service for this growth. Schematics of the proposed water and sewer systems are shown in Figures IV-1, IV-2 and IV-3. Both water and sewer systems must be enlarged and reinforced in order to adequately meet the demands of the additional customers.

The Appomattox water system will require additional wells to meet the demands of the larger system. The number of water services is expected to increase from approximately 525 to 2655 during the 20 year design period. An additional storage tank of at least one million gallons capacity will be required to provide adequate fire protection and an emergency source of supply. New mains will be required in the distribution system to distribute water into the newly developed areas.

The number of sewer services is expected to increase from approximately 500 at present to over 1660 by the year 1990. This increase will require that a new sewage treatment plant be installed to serve the Appomattox area. It is proposed that the existing plants be abandoned and that all sewage in the area be collected and carried to the central plant by a system of interceptor sewers, pump stations and force mains arranged similarly to those shown in Figure IV-3.

The proposed Pamplin City water and sewer systems are shown in Figures IV-4 and IV-5. These systems have been investigated in detail in the 1969 Pamplin City Engineering Report on Water and Sewer. Both water and sewer service are badly needed in Pamplin. The Appomattox County Health Department in 1964 made a study of water and sanitary facilities in the Town and found many unacceptable conditions.

The approximate estimated current total cost of proposed water and sewer improvements at Appomattox are as follows:

	<u>Phase I</u> 1975	<u>Phase II</u> 1990
Water System	\$1,040,000	\$1,950,000
Sewage System	\$1,000,000	\$ 880,000

The approximate estimated current total cost of proposed water and sewer improvements for Pamplin City are as follows:

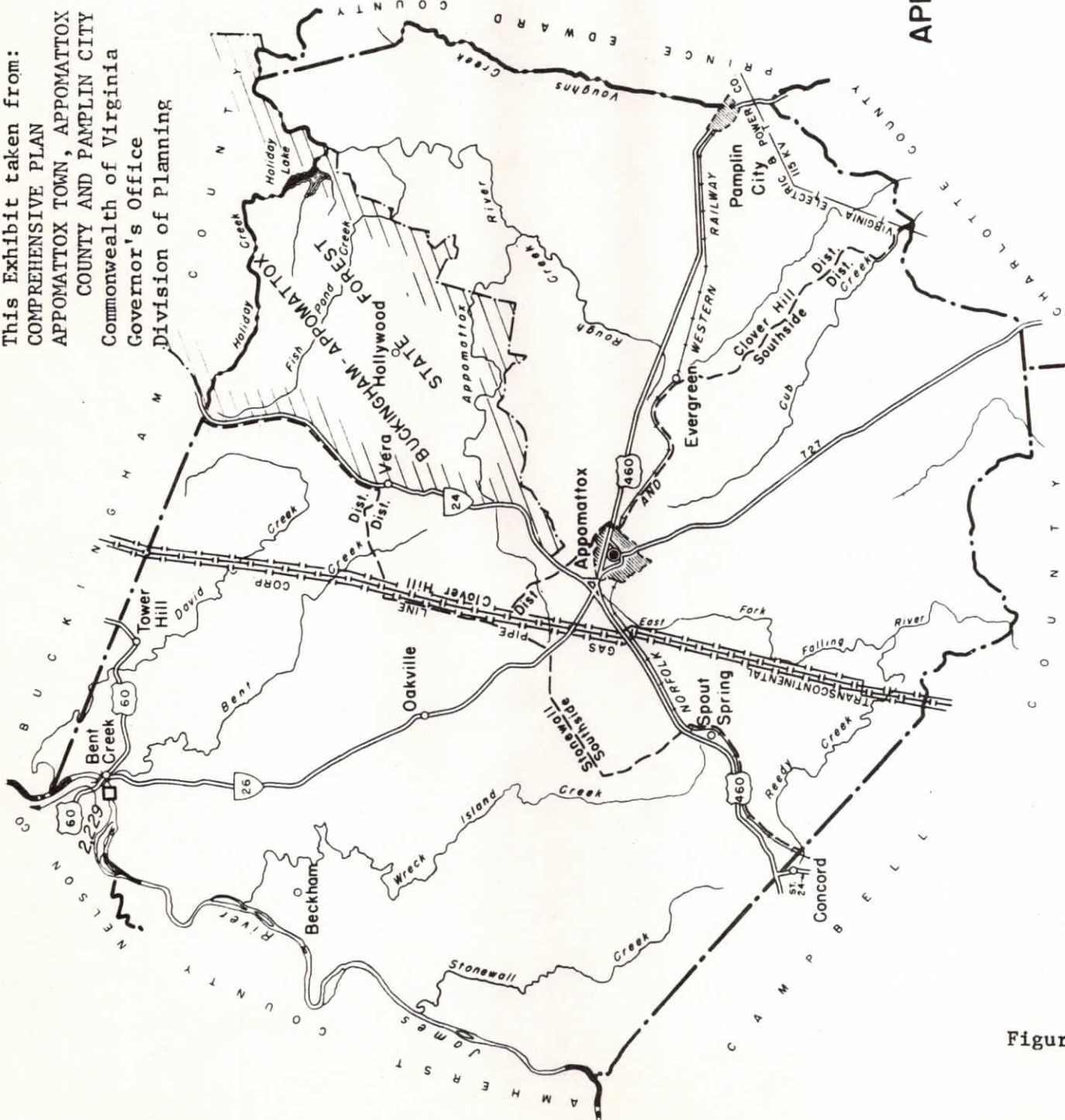
Water System	\$375,000
Sewage System	\$490,000

It is recommended that work be started on both the Appomattox and Pamplin water and sewer systems at once. Federal and State assistance programs should be used to the maximum possible extent in order to get user cost figures down to a reasonable level.

This Exhibit taken from:
 COMPREHENSIVE PLAN
 APPOMATTOX TOWN, APPOMATTOX
 COUNTY AND PAMPLIN CITY
 Commonwealth of Virginia
 Governor's Office
 Division of Planning

LEGEND

- U S NUMBERED HIGHWAYS
- VIRGINIA PRIMARY HIGHWAYS
- RAILROADS
- TRANSMISSION LINES
- NATURAL GAS LINES
- COUNTY BOUNDARY
- CORPORATE LIMITS
- COUNTY SEAT
- POWER SUBSTATION
- STREAM GAGING STATION
- DIRECTION OF AND AVERAGE FLOW IN MILLIONS OF GALLONS PER DAY (FLOWS OF LESS THAN 5 M G D NOT SHOWN)
- 20
- WEST BOUNDARY IS JAMES RIVER
- MAGISTERIAL DISTRICT LINE



KEY FEATURES AND ECONOMIC DATA
APPOMATTOX COUNTY
 VIRGINIA



1970

OFFICE OF THE GOVERNOR
 DIVISION OF STATE PLANNING AND COMMUNITY DEVELOPMENT

Figure I-1

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FIGURES II-1 through II-11

II. NARRATIVE REPORT

It is intended that this Section present briefly and concisely information relative to those factors which will have a bearing on the development of water and sewerage facilities for Appomattox County. Where figures or maps are used to supplement the narrative report, those dealing with present population and population distribution are based upon 1960 census data since this is the latest complete information available. Where later information is available it is used in the text of the report.

A. The Present Situation

1. Trends and Description of Present Population

The population of Appomattox County grew by 4.4 per cent during the 1950's and by 7.0 per cent during the 1960's. The primary reason for the slight increase in the rate of growth was the significant decrease in the rate of out-migration. Net out-migration from Appomattox during the 1950's totaled 616 persons as compared to an out-migration of only 98 persons during the 1960's.

Attention is called to Figures II-2 through II-6 which relate to present population trends and patterns within the State of Virginia and Appomattox County. Figures II-1 and II-2 show changes

in population by counties (1950-60) and population distribution across the state. Figures II-3 and II-4 show Population Distribution - Appomattox County and Population Distribution - Appomattox and Vicinity. Figures II-5 and II-6 are curves which show Population Trends and Projections (1930-1970) and Percentage Changes in Population (1930-1970). Figure II-6 compares the growth rates of the United States, the State of Virginia, Appomattox County, the Town of Appomattox and Pamplin City. Population changes during the period 1930-1970 are as follows:

<u>Population</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>
Appomattox County	8402	9020	8764	9148	9784
Appomattox Town	704	992	1094	1184	1400
Pamplin City	323	250	312	273	343
Southside District	- -	3394	3624	3794	4450
Clover Hill District	- -	2622	2440	2540	2812
Stonewall District	- -	3004	2700	2814	2522

As can be seen from above, the present population (1970) of Appomattox County is 9784 persons, a seven per cent increase over the 1960 population. All of the county's population growth in the 1960's occurred in the Southside District which surrounds the Town of Appomattox. Both Stonewall District and Clover Hill District suffered a slight decrease in population during the

same period. Population density in the County is as follows:

	<u>1970 Pop.</u>	<u>Area (Sq.Mi.)</u>	<u>Density</u>
Stonewall District	2,522	131.8	21.3
Clover Hill District	2,812	121.5	20.8
Southside District	<u>4,450</u>	<u>91.7</u>	<u>48.5</u>
Total for County	9,784	345.0	28.4

The only two incorporated Towns in the County are Appomattox and Pamplin City. The Town of Appomattox has a population of 1400 persons; however, approximately 1100 additional persons reside within one mile of the Town line. Pamplin City is located mostly in Clover Hill District and has a population (1970) of 343 persons. The easterly portion of Pamplin City lies in Prince Edward County.

As of 1970 there were 3131 workers residing in Appomattox County. (See Table 1) Of these, approximately 92 were unemployed and approximately 850 worked outside of the County, mostly in the Lynchburg metropolitan area. On the other hand, an inflow of approximately 250 persons come in from outside of the County to work. Approximately 927 workers were employed in manufacturing; 452 in agriculture; 140 in state-federal government and the remaining 1520 were engaged in locally oriented supporting services including

TABLE I - ECONOMIC BASE ANALYSIS WITH PROJECTIONS - APPOMATTOX COUNTY

	Values			Percent of Virginia			Average Rate of Change			
	March 1950	March 1970	March 1980	March 1950	March 1970	March 1980	1950-60	1960-70	1969-80	
Population	8,764 ^{a/}	9,784 ^{a/}	10,500	0.2	0.2	0.2	0.4	0.6	0.7	
Labor force, by place of work	2,852	3,131	3,555	0.2	0.2	0.1	0.7	0.1	1.1	
Unemployment	136	92	125	0.2	0.2	0.2	1.0	-5.3	2.8	
Employment, by place of work	2,716	3,039	3,430	0.2	0.2	0.1	0.7	0.4	1.1	
Basic employment	1,529	1,519	1,555	0.2	0.2	0.1	0.9	-1.1	-0.2	
Agriculture	1,079	452	300	0.6	0.7	0.5	-3.0	-5.9	-3.6	
State-Federal Government ^{b/}	70	140	175	...	...	...	6.3	0.9	2.0
Manufacturing	380	768	927	0.2	0.2	0.2	7.2	2.1	1.4	
Lumber	148	99	80	0.5	0.4	0.3	-3.9	-0.4	-1.5	
Apparel	232	652	821	1.4	2.8	2.2	10.8	2.5	0.8	
Other manufacturing ^{c/} .....	...	17	100	...	...	...	...	...	...
Supporting employment	1,187	1,242	1,520	0.2	0.2	0.1	0.4	2.2	1.9	
Percent of total employment basic	56.2	50.0	45.3	107.4	122.8	112.8	...	...	...
Labor force as a percent of population	32.5	32.0	33.9	82.2	87.5	78.8	...	...	...
Annual data:										
Per capita income	\$ 752	\$ 1,478	\$ 2,056 ^{d/}	...	58.4	80.2	74.0	...	6.9	4.8
Total income (000)	\$ 6,590	\$ 13,517	\$ 21,019 ^{d/}	...	0.2	0.2	0.2	...	7.4	6.5
Retail sales (000) ^{e/}	\$ 3,532	\$ 6,101	\$ 8,641	...	0.2	0.2	0.1	...	5.6	3.9

^{a/} The 1950, 1960 and 1970 population figures are as of April 1, from the U. S. Census of Population. The employment figures in the 1970 column are March, 1969 Virginia Employment Commission figures.

^{b/} Included in this grouping are federal employment at the Appomattox Court House National Historical Park and state employment at both the East Central District Office of the Agricultural Extension Service and the Virginia State Police Third Division Headquarters. See text under Government for further explanation.

^{c/} Employers in this category are the furniture and stone, clay and glass products, and transportation equipment industries.

^{d/} Represents a 1967 estimate by the Bureau of Population and Economic Research of the University of Virginia.

^{e/} Because retail data were not available for 1950, 1960 and 1969, corresponding data from the 1948, 1958, and 1967 Censuses of Business were used.

Sources: Virginia Employment Commission; U. S., Bureau of the Census, Census of Business and Census of Population; David C. Hodge, "Personal Income Estimates: Virginia Counties and Cities, 1960, 1965, and 1967," University of Virginia, Bureau of Population and Economic Research (1962); State of Virginia, Division of Industrial Development; Virginia State Chamber of Commerce, Industrial Directory of Manufacturing in Virginia, (1969); John Littlepage Lancaster, "Personal Income Estimates for Virginia Counties and Cities: 1960," University of Virginia Bureau of Population and Economic Research (1963); Commonwealth of Virginia, Division of Industrial Development, Virginia State Police and Division of Parks; Joint Committee on the Reduction of Non-essential Federal Expenditures, Federal Civilian Employment by County, December 31, 1950, (1961), title abbreviated.

This Exhibit is taken verbatim from Projections and Economic Base Analysis Feb. 1971 Division of State Planning and Community Affairs.

Table I

local government, retail trade, utilities, banking, real estate, transportation and insurance.

2. Present Financial Condition. Local Government and Employment

Appomattox County's per capita income was \$2,056 in 1967 according to an estimate by the Bureau of Population and Economic Research at the University of Virginia. This figure represents 74 per cent of the State's average 1967 per capita income. Total 1967 personal income was estimated to be \$21,019,000. Medium family income for 1959 was estimated to be \$3,495 or 70.4 per cent of the Virginia average of \$4,964 for the same year. In 1959 43.2 per cent of the families in the County had an income of less than \$3,000; 4.4 per cent had an income in excess of \$10,000. Adjusted gross income for 1968 was \$16,884,283 or \$4,708 per return. This figure is 73.2 per cent of the State Average of \$6,429.

Retail sales for the County totaled \$8,641,000 in 1967. This represents a 3.6 per cent increase over the 1958 figure. The County's per capita retail sales figure of \$883 represents roughly 67 per cent of the State figure. The below average retail sales in the County are largely attributable to County residents trading in the Lynchburg Metropolitan Area.

Wholesale trade in the County amounted to \$1,260,000 in 1967. This compares with a figure of \$6,162,254,000 for the State of Virginia.

The Fiscal Statement for Appomattox County for the year ended June 30, 1969, showed a total operating budget for the year of \$1,765,550. This budget was derived from the following sources:

Balance as of July 1, 1968	\$ 95,057
<u>Credits</u>	
Revenue	
From Local Sources	674,261
From the State	803,849
From the Federal Government	191,183
Non-Revenue	1,200
Total Credits and Balances	\$1,765,550

Debits and Balances were as follows:

Government Operating Expense	\$ 243,170
School Operating Expense	1,201,112
Capital Outlays	52,682
Interest and Debt Costs	14,308
Redemption of Debt	32,275
Balance as of July 1, 1969	222,004
Total Debits and Balances	\$1,765,550

The total assessed value of locally taxable property for the year 1968 was \$18,746,369. Net County debt for that year was \$589,500, a very low 3.1 per cent of the total assessed value.

Local property taxes for the tax year 1969 were as follows:

<u>Type of Tax</u>	<u>Amt. of Tax</u>
Real Estate	\$276,290
Tangible Personal Property	81,158
Public Service Corporations	187,766
Machinery and Tools	1,064
Merchants Capital	4,743
Total Tax	\$551,021

Taxes are derived on the basis of the following rates:

Real Estate

<u>Area</u>	<u>Tax Rate</u>	<u>Assess. Rating</u>	<u>Effect. Tax</u>
	Per \$100		Per \$100
Appomattox County	\$3.00	\$0.30	\$0.90
Appomattox Town	1.00	0.30	0.30
Pamplin City	1.00	0.30	0.30

Machinery and Tools

Appomattox County	3.00	(Method of assessment varies (Town tax in addition to (County tax
Appomattox Town	1.00	(County tax

Tangible Personal Property

Appomattox County	3.00	(Method of assessment varies (Town Tax in addition to (County Tax
Appomattox Town	1.00	(County Tax

<u>Area</u>	<u>Tax Rate</u>	<u>Assess. Rating</u>	<u>Effect. Tax</u>
		<u>Merchants Capital</u>	
Appomattox County	0.60	(Method of assessment varies (based on stock inventory and (the excess of receivables over (payables. Town tax in addition (to County tax.	
Appomattox Town	0.40		

Other taxes which apply in Appomattox County are license taxes on vending machines, carnivals and circuses. There are no license tags, utility taxes, merchant licenses, or professional occupational licenses. However, the Town of Appomattox levies a license on merchants, professional men and contractors and has Town auto license tags.

The local governments in the area are organized as shown below:

- a. Appomattox County is governed by an elected three man board of supervisors, one each from the County's three districts. The supervisors serve four year terms.
- b. The Town of Appomattox has a Council-Mayor-Manager form of government. The six member council and the mayor are elected to two year terms. The town manager is appointed by the council and the mayor.
- c. The Town of Pamplin has a six member council and mayor who are elected to two year terms.

Major employment within the County (exclusive of government, railroad, agriculture, self-employed, domestic services and non-profit organizations) is provided by construction, manufacturing, trade and services. A breakdown on 1970 employment in these fields is shown below:

	<u>Construc- tion</u>	<u>Manufac- turing</u>	<u>Trade</u>	<u>Services</u>	<u>Total</u>
Av. No. Of Es- tablishments	10	14	24	6	65
Av. Employment	147	934	258	29	1,466
Total Wages	\$847,803	\$3,409,425	\$1,070,855	\$112,273	\$5,942,645
Av. Wage Per Employee	\$ 5,767	\$ 3,650	\$ 4,151	\$ 3,871	\$ 4,054
Percent of Co- unty to State Av. Wage	83.5	57.4	81.0		67.6

Manufacturing has become the largest single source of employment in the County. Major manufacturing firms in the County are:

<u>Name</u>	<u>Loc.</u>	<u>Product</u>	<u>Approx. Emp. March 1970</u>
Hill City Mfg. Co.	Appo.	Children's Outerwear	250-499
Appomattox Fin. Co.	Appo.	Garment Finishing	250-499
Amelia Dress Co.	Appo.	Children's Outerwear	100-249
R.F. Williams	Pamp.	Lumber	1-19
R.S. Burruss Lum. Co.	Pamp.	Lumber	20-49
D.E. & E.W. Paulette	Appo.	Lumber	1-19

<u>Name</u>	<u>Loc.</u>	<u>Product</u>	<u>Approx. Emp. March 1970</u>
Bernice A. Johnson	Appo.	Lumber	1-19
Martin & Ferguson	Sp.Spr.	Lumber	1-19
Jamerson Sons	Appo.	Lumber	1-19
Edward F. Davis	Pamp.	Lumber	1-19
Times Virginia	Appo.	Newspaper	1-19
Clover Hill Mfg. Co.	Appo.	Modular Homes	50-99
Appomattox Garment Co.	Appo.	Girls', Childrens & Infants' Outerwear	1-19
Crewe Fashions	Appo.	Childrens' Outerwear	50-99

3. Schools, Churches, Transportation and Public Utilities

All four public schools which serve Appomattox County are located in the Town of Appomattox. There are three elementary schools and one high school. A breakdown of public school attendance and costs is shown below:

<u>Item</u>	<u>Appo. County</u>	<u>Virginia</u>
Number of children in 1968 School Census, Ages 7-19	2,126	1,100,378
Enrollment, 1968-69	2,313	1,088,913
Gross average daily attendance, 1968-69	2,123	986,152
Cost of operation per pupil in gross average daily attendance, 1968-69	\$519	\$571
Pupil-teacher ratio, 1968-69	23	22.6

<u>Item</u>	<u>Appo. County</u>	<u>Virginia</u>
Average annual teacher salary, 1968-69	\$6,758	\$7,328
High school enrollment, 1968-69	826	380,701
High school graduates, 1968-69	128	53,392
High school dropouts, 1968-69	36	17,120
Percent of high school graduates going to college, 1969	36	51.0
Percent of high school graduates continuing education in other than college, 1969	5	11.0

Elementary schools are adequate at present, and a new high school is being planned for construction in the near future.

There are no colleges located in the County; however, there are several in the surrounding area which offer advanced educational opportunities. The four year accredited colleges include:

Randolph Macon Woman's College	Lynchburg
Lynchburg College	Lynchburg
Longwood College (for women)	Farmville
Hampden-Sydney College (for men)	Farmville
Sweet Briar College (for women)	Amherst County

Two year accredited colleges include:

Virginia Seminary and College	Lynchburg
Central Virginia Community College	Lynchburg

There are 30 churches in Appomattox County representing six Protestant denomination. Roman Catholic and Jewish places of worship are located in Lynchburg.

Transportation in the County can be divided into three categories:

(1) Highway, (2) Rail and (3) Air. The principal highway through the County is dual lane arterial U.S. Rte. 460 which crosses east-west through the central part of Virginia from Norfolk through Petersburg, Lynchburg, Roanoke and into West Virginia and Kentucky. Primary U.S. Rte 60 crosses the north-eastern corner of the County in an east-west direction. State Routes 24 and 26 serve to connect Routes 460 and 60 near Appomattox. In addition, many miles of secondary routes provide access to the more remote areas of the County.

Figure III-1 "MAP OF APPOMATTOX COUNTY" shows Federal and State Highways within the County.

Motor Freight transportation is provided by eight authorized interstate carriers and three authorized intrastate carriers. Overnight service is available to ports and cities in the Eastern United States.

Greyhound Bus Lines provide daily passenger service to Lynchburg, Roanoke, Richmond, Norfolk and Lexington.

The Norfolk and Western Railway crosses the County in an east-west direction and provides freight service at Appomattox and Pamplin City. Connections with the Southern Railway and the Chesapeake and Ohio Railway in Lynchburg provide a nationwide shipping capability. Passenger service has been discontinued.

Air transportation is available at Preston Glen, Lynchburg's licensed Municipal Airport, which is located approximately 25 miles from the Town of Appomattox. This airport is served by Piedmont Airlines which provides direct flights to cities in Virginia and nearby states with connecting flights to more distant points. The airport has three runways which vary in length between 3,748 and 5,800 feet. The airport is open 24 hours a day and fuel, lodging, food, surface transportation and charter flight service are available.

Public Utilities serving the County at present include electric power and telephone. Demand for natural gas has not been great enough to justify installation of this service.

Telephone service is provided to the entire County by the Continental Telephone Company which has local offices in Amherst.

Electric power is furnished to the County by three public utility companies; (1) Virginia Electric and Power Company, (2) Southside

Electric Cooperative, and (3) Central Virginia Electric Cooperative. The areas within the County which are served by each are defined in Figure III-4, "Electric Power and Telephone Utilities Serving Appomattox County". The Virginia Electric and Power Company is the primary producer of power in the area and it supplies electric power to both electric cooperatives operating in the County. The Virginia Electric and Power Company has at present a system capability of approximately 5,000,000 kilowatts. Power is available as 60 cycle alternating current, single and three phase service, and at the voltage required by the customer.

Natural gas is not commercially distributed in Appomattox County at the present. However, the Citizens Gas Company and Virginia Pipe Line Company, both subsidiaries of Lynchburg Gas Company, have been authorized to serve Appomattox Town and Appomattox County respectively. At present the demand for gas is insufficient to justify the extension of costly mains into the area. Large transmission mains (30 in. and 36 in.) of the Transcontinental Gas Pipe Line Company cross the County in a north-south direction.

4. Existing Water and Sewer Systems

Public water and sewer systems in the County are limited to those provided by the Town of Appomattox for its citizens. Pamplin City

does have two privately owned water systems which provide domestic water to approximately one-third of its population. Refer to Figures III-7, III-8 and III-9 for layout of existing systems in Appomattox and Pamplin City.

The water system for the Town of Appomattox provides an adequate quantity and quality of water to its approximately 525 customers. Approximately 65 of the customers served live outside of the corporate limits. The system consists of:

- (1) Three wells which serve as a source of supply
- (2) A distribution system which contains approximately:
 - 1.0 mi. of 8 in. and larger pipe
 - 0.5 mi. of 6 in. pipe
 - 5.0 mi. of 4 in. pipe
 - 2.5 mi. of 3 in. and smaller pipe
- (3) Two elevated storage tanks of 30,000 gallons and 100,000 gallon capacity

The wells used by Appomattox at present are #1, #5 and #6. Wells #2, #3 and #4 have been taken out of service due to poor chemical quality and low flows. Wells #5 and #6 are used as the primary source of supply to the Town and have at present a combined capacity of approximately 180 gallons per minute; approximately 140 gallons per minute for #5 and approximately 40 gallons per minute for #6. Well #1 is used as a standby source of supply due to the fact that its chemical quality is not as good as either Well #5

or Well #6. Another well is proposed for the immediate future and will be drilled as soon as the exact location is decided upon.

The Appomattox water distribution system is entirely adequate for domestic water supply; however, some portions of the Town do not have adequate provision for fire protection due to a preponderance of 4 in. street mains. According to the 1964 "Town of Appomattox Engineering Report on Water Supply System" available hydrant flows in the central business district varied from 80 to 250 gallons per minute. (One medium sized fire pumper requires at least 600 gallons per minute). Approximately one mile of 8 in. and 10 in. mains have been installed since 1964 and another 3000 lin. ft. of 8 in. main is proposed for construction in Route 131 (Court Street) in the near future. As witnessed by this construction, the Town is working steadily and diligently to develop a strong distribution network in and around the Town.

The distribution system is divided into "high" and "low" systems. the "high" system serves that area north of the Norfolk and Western Railway and the "low" system serves that area south of the railway. The "high" and the "low" systems are interconnected by means of a booster station which pumps from "low" to "high". All of the Town's wells pump into the "low" system.

The two elevated storage tanks are of the gravity type and float on the system. A 100,000 gallon tank with an overflow elevation

of 997 floats on the "high" system. A 30,000 gallon tank with an overflow elevation of 914 floats on the "low" system. Because of the rolling terrain, pressures in the "high" system vary between 50 psi and 75 psi. Pressures in the "low" system vary between 40 psi and 60 psi.

Water rates in Appomattox are set at \$4.50 minimum for the first 5000 gallons used and \$0.50 per thousand gallons thereafter. For those outside of Appomattox who are connected to the Town system, the minimum is \$7.20 for the first 5000 gallons and \$0.50 per thousand gallons thereafter. Billing is bimonthly.

The sewage system for the Town of Appomattox collects and treats sewage only within the limits of the Town except for a few exceptions where the Town has by special vote of the council agreed to accept sewage from outside of the corporate limits.

The sewage system for the Town of Appomattox is shown on Figure III-8 and consists of the following:

- (1) A collection system consisting of approximately nine miles of gravity sewers which is predominantly 8 in. non-reinforced concrete pipe.
- (2) An Imhoff - trickling filter plant, installed in the mid

1930's which treats the sewage from that portion of the Town lying south of Route 460.

- (3) A 2.1 acre waste stabilization pond which treats the sewage from that portion of the Town lying north of Route 460.

The sewage collection system was installed in large part during the 1930's. The few thousand feet of sewer which has been installed since then is constructed of extra strength vitrified clay pipe in lieu of the non-reinforced concrete pipe used in the original system. The original system layout was good and slopes are adequate to provide capacities and velocities necessary to insure good performance. However, the original pipe was apparently an inferior grade of concrete and considerable deterioration has taken place since the pipe was installed. Thus, some of the pipe in the original system needs to be replaced.

The trickling filter sewage treatment plant which serves the southerly portion of Appomattox was designed using the criteria of the 1930's. Thus, by today's standards the plant is badly "out of balance" and some units are underdesigned. The Town estimates that at this time there are approximately 355 service connections going into this plant. Based upon an equivalent population of 1.3 persons per capita (as determined in the 1964 Report, "Town of Appomattox Engineering Report on Sewerage and

Sewage Treatment System") the total connected load is estimated to be equal to an equivalent population of 1267 persons. ✓

A study made by the Virginia State Health Department Engineering Section rated the various units of the plant as follows:

<u>Unit</u>	<u>Capacity in Equiv. Pop.</u>
Imhoff Tank Settling	1420
Imhoff Tank Digestion	864
Trickling Filter	1600
Final Settling Tank	584
Sledge Drying Beds	1510

A short series of tests to determine the effectiveness of this plant were run by the State Water Control Board in August 1971. The results indicated that the plant was at the time achieving better than 90 per cent B.O.D. removal and better than 50 per cent suspended solids removal.

The 2.1 acre waste stabilization pond which serves that portion of Appomattox which lies north of Route 460 was designed and built in 1964, using criteria then in use (400 persons per acre) to provide a capacity for 810 persons equivalent population. ✓

Today, design criteria has drastically reduced the allowable loading to 200 equivalent persons per acre. Thus, under today's criteria the allowable capacity of the pond is 405 persons equivalent population. The Town has counted 155 service connections feeding into the pond. Based upon this figure, it is estimated that the total connected load is 553 persons equivalent population. The pond appears to be overloaded. Tests run by the State Water Control Board in August 1971 indicated that B.O.D. removals varied between 30 per cent and 70 per cent and that suspended solids removal varied between 27 per cent and 67 per cent. It is anticipated that more complete tests will be run by the Water Control Board in the near future.

Two private water systems serve a total of approximately 43 customers within the corporate limits of Pamplin City. These systems both use wells and hydro-pneumatic tanks to supply their customers. The systems provide water serving only to those residences and businesses located centrally in the Town. Distribution pipe sizes are 2 in. diameter and smaller. (See Figure III-9). Neither of the installations meet State Health Department Standards and it is extremely doubtful that they could be incorporated into any future permanent water supply system.

The Farmers Home Administration has approved a sizable grant to assist Pamplin City in developing a permanent water system

as shown in Figure IV-4. This is being considered by the citizens of Pamplin City at this time.

5. Natural Resources and Economic Potentials

Rock and mineral resources of Appomattox County include manganese, iron, copper ores, quartzite, clay, talc, sand and gravel. Manganese has been mined in the northwestern part of the County and also near Concord. Iron ore was mined for many years at several points along the James River and smelted at local furnaces. Small amounts of Copper ore were mined near Beckham and smelted locally. Quartzite and marble have been quarried and used as crushed stone. High quality clay was obtained near Pamplin City. Talc occurs north of Appomattox, but commercial deposits have not been discovered. Sand and gravel have been produced from crushed stone for use as concrete aggregate. Figure II-8, "Geologic Map of Appomattox County", shows the various rock formations which occur in the County.

Forest resources in the County include approximately 160,000 acres of commercial forest land according to a 1966 survey. This represented an increase of approximately 3 per cent in the previous decade. The ownership of commercial forest land is 94.4 per cent in private holdings. The other 5.6 per cent (9000 acres) occur in Buckingham-Appomattox State Forest. Appomattox County has recently become one of the five leading pulpwood producing

counties in the State. One problem which occurs is that of the annual softwood cut outstripping softwood growth. The answer to this evidently is to concentrate more on the low quality hardwoods. Forest types include approximately 22 per cent pine; 15 per cent oak-pine and 64 per cent oak-hickory. Saw timber represents approximately 32 per cent of the total commercial acreage.

The economic potential of Appomattox County seems to lie in attracting industry to the County. It has much to offer in the way of available land, facilities and resources. Land is available almost anywhere in the County in either large or small tracts. Transportation by highway or rail is convenient. A labor force (in limited numbers) is available for training. Those industries not requiring large quantities of process water could be furnished public water and sewer service by the Town of Appomattox. For those industries requiring it, large quantities of water are available from the James River and its tributaries. At the present time, the County seems to be moving in the direction of increasingly becoming a "bedroom" community to nearby industry. Agriculture in the County is on the decline and farm workers will be turning more and more to outside jobs.

6. Agricultural Land Pattern, Production and Trends

There were 638 farms in Appomattox County in 1964 according to

the 1964 Census of Agriculture. There was a total of 103,100 acres in farms of which almost half was classified as woodland. The average size of farms was 161.6 acres. According to the V.P.I. extension service in Appomattox, the number of farms decreased from an estimated 999 in 1954 to an estimated 550 in 1970. In 1970 there were 21 Grade A dairy farms in the County, the location of which is shown in Figure III-1.

Farm employment in the County decreased from 1079 in 1950 to an estimated 452 in 1970. It is estimated that the decrease will continue at an annual rate of 3.6 per cent per year and that in 1980 farm employment will total approximately 300 persons.

Principal sources of farm income are livestock and livestock products. Other important sources of farm income include fire-cured tobacco, whole milk, standing timber and pulpwood. A breakdown of farms in the County by economic class is shown in Table 2.

Table 2 - FARMS BY ECONOMIC CLASS (VALUE OF FARM PRODUCTS SOLD)
FOR APPOMATTOX COUNTY AND THE STATE, 1964

Type and Class of Farm	Appomattox County		State of Virginia	
	Number	Percent of All Farms	Number	Percent of All Farms
All Farms	638	100.0	80,354	100.0
Commercial farms	357	56.0	46,218	57.5
Class I	2	0.3	1,784	2.2
Class II	8	1.3	2,976	3.7
Class III	31	4.9	5,536	6.9
Class IV	65	10.2	9,882	12.3
Class V	122	19.1	12,462	15.5
Class VI	129	20.2	13,578	16.9
Other Farms	281	44.0	34,136	42.5
Part-time ^{a/}	166	26.0	20,089	25.0
Part-retirement ^{b/}	115	18.0	13,988	17.4
Abnormal ^{c/}	...	...	59	0.1

Note: Class sizes are as follows: Class I - Sales of \$40,000 or more; Class II - Sales of \$20,000 to \$39,999; Class III - Sales of \$10,000 to \$19,999; Class IV - Sales of \$5,000 to \$9,999; Class V - Sales of \$2,500 to \$4,999 and Class VI - Sales of \$50 to \$2,499.

^{a/} Farms with sales of \$50 to \$2,499 in which the operator was under 65 years of age and worked off the farm more than 100 days or had non-farm income greater than the value of farm products sold.

^{b/} Farms with sales of \$50 to \$2,499 in which the operator was 65 years of age or over.

^{c/} Institutional farms and Indian reservations.

Source: U.S., Bureau of the Census, 1964 U.S. Census of Agriculture.

This Exhibit is taken from "Projections and Economic Base Analysis" - Feb. 1971 - Division of State Planning and Community Affairs.

7. Water Resources

The ground water geology for Appomattox County is thoroughly covered in EXHIBIT 1, a letter report from the Commonwealth of Virginia Division of Water Resources to Hankins and Anderson. A copy of the letter is inserted in the APPENDIX at the back of this report. Much of the material concerning wells in the Town of Appomattox has been covered previously under 4. Existing Water and Sewer.

Ground water information in the County as a whole is meager. Where deep wells have been installed, very few have been accurately tested. There is little actual flow and drawdown data available. What is apparent, however, is that there are few really good wells in the County. As the Division of Water Resources suggests, there are probably some good well locations in the County, but some prospecting will be required to find them. Generally, the best tentative locations for wells appear to occur along contact zones between geologic formations. Since the County is underlain by igneous and metamorphic rock the possibility of fracture zones (and water holding capability) are much greater along these lines than elsewhere. Figure II-9 shows the approximate location of these contact zones based upon available geologic data. Also shown in Figure II-9 are points where the prospects of finding a good source of ground water appear to be enhanced.

Based upon Division of Water Resources findings, the prospects of finding water in the County are as follows:

<u>Location</u>	<u>Anticipated Well Flow (gpm)</u>	<u>Remarks</u>
Appomattox	50-150	Apparently over contact zone
Concord	3-30	
Evergreen	3-15	
Spout Spring	2-20	May be able to get more flow
Vera	5-150	Apparently over contact zone

Chemical quality of ground water in Appomattox County varies widely. Past experience indicates that some ground water has excellent quality while that from nearby wells is of such poor quality as to be virtually unfit for consumption. Some of the chemical problems which have occurred include iron, manganese, sulphur dioxide, low pH and high solids content.

Surface water supplies which would be of use to the more heavily populated areas of Appomattox County would generally be limited to those furnished by impoundment type reservoirs. Most streams of any size are located near the boundaries of the County. This is due to the fact that drainage divides pass centrally through the County. U. S. Route 460 very nearly follows the East-West

ridge which separates the James and Appomattox River Basins from the Roanoke River Basin. That portion of the County which lies north of Route 460 drains into the James and Appomattox Rivers; that portion which lies south of Route 460 drains to the Roanoke River Basin via the Falling River and Cub Creek. Most of the larger communities in the County lie along or near Route 460 and thus are at a maximum distance from any sizable streams. Appomattox Town is located at the headwaters of the Appomattox River and the North Fork of the Falling River. Figure II-10, "SURFACE WATER RESOURCES IN APPOMATTOX COUNTY" pinpoints many possible locations for impoundment type reservoirs. This information was furnished by the Soil Conservation Service of the U. S. Department of Agriculture and is based upon their watershed project survey of the County. There are many other possible reservoir locations, however, it would probably be more economical to choose a site which would be acceptable as a multi-purpose watershed project so that the cost of the reservoir might be shared.

The major stream in the County is the James River which divides Appomattox and Amherst Counties. Water Resources Data for Virginia (1970) indicates a drainage area of 3863 square miles for the James River at Bent Creek. Average discharge at this point over a 46 year period has been 4,035 cubic feet per second. Extremes in discharge at Bent Creek have varied from a maximum discharge of 144,000 cubic feet per second on August 20, 1969, to a minimum

discharge of 222 cubic feet per second on October 13, 1930. Runoff carried by the James River at Bent Creek has averaged 14.88 inches per year.

Other significant streams in the County are Bent Creek and Wreck Island Creek in the James River Basin; the Appomattox River which enters the James at Hopewell and; the North Fork of the Falling River, Big Cub Creek and Little Cub Creek in the Roanoke River Basin. Little actual flow data on these streams is available, however, enough is available to indicate that the streams in the James Basin carry a higher runoff (in. per yr.) than do those in the Roanoke Basin.

As far as can be determined, none of the streams passing through or bordering Appomattox County is used for public water supply purposes within 30 miles of the County line.

8. Topography

Appomattox County encompasses 343 square miles of rolling hill country in central Virginia. The countryside is interlaced with many small stream channels. Figure III-2, "TOPOGRAPHIC MAP OF APPOMATTOX COUNTY" shows that Route 460 follows approximately an east-west ridge line which passes centrally through the country. This ridge remains more or less level between Concord and Appomattox

varying only slightly from an elevation of 850 feet above mean sea level. However, between Appomattox and Pamplin the ridge gradually falls off to an elevation of approximately 690.

Extremes in elevation in the County vary from a low of approximately 380 at the Bent Creek gaging station on the James River to a high of approximately 1145 at Piney Mountain. As has been pointed out previously, the County drains into three major river basins; the James and the Appomattox on the north and the Roanoke on the South. Major flooding which might endanger lives and property are practically unknown in the County except along the James River in the vicinity of Bent Creek.

9. Existing Land Use

A "Comprehensive Plan, Appomattox Town, Appomattox County and Pamplin City" prepared by the Commonwealth of Virginia, Governor's Office, Division of Planning, investigates thoroughly present and future land uses for the County and the two principal towns in the County.

The comprehensive plan concludes that Appomattox County is fast becoming a "rural non-farm" area rather than the "rural-farm" area which it has been in the past. There are still over 100,000 acres classified as farmland in Appomattox County, but many of

the farms are becoming "ex-burb" homes for County residents who work in the Lynchburg area. Existing land uses for the Town of Appomattox are shown in Figure III-5. Existing land use ratios are defined by the comprehensive plan in terms of area and population as follows:

<u>Use</u>	<u>Acres</u>	<u>Ac. per 100 Persons</u>
Residential	174.60	13.4
Business	19.06	1.5
Industrial	30.07	2.3
Public and Semipublic	30.85	2.5
Streets and Railroad	<u>58.68</u>	<u>4.5</u>
	318.26	28.6

The 318.26 acres in use represents almost exactly one-half of the Town's 640 acres. This leaves approximately 321.74 acres available for future development.

Land uses for the Town of Pamplin are shown in Figure III-6.

It can be seen that the major existing use of land is for single family dwelling units. Much of the Town's 216 acres remains vacant and available for future expansion.

10. Recreation and Tourism

Recreational activities in Appomattox County consist primarily of school, church, civic and 4-H related functions. There are several amateur baseball teams which make use of available facilities at Appomattox and Pamplin. The Town of Appomattox has a recreational council which plans activities for young people of the town and county. A public library is available in the Town of Appomattox.

In addition, there is Holiday Lake, a state recreational area located off of Route 24 in Appomattox-Buckingham State Forest which provides for public swimming, fishing, boating and picnicking. Appomattox-Buckingham State Forest is a game preserve in which the hunting of deer and small game is permitted in season. A public access area at Bent Creek provides parking and boat launching facilities for fishing and duck hunting along this section of the James River.

Appomattox Courthouse National Historical Monument, where the surrender of the Confederate army took place in 1865, attracts visitors in ever increasing numbers from all parts of the United States. The old buildings of the original Appomattox Courthouse have been restored to their 1865 condition and appearance.

11. Real Estate Values

According to the Commonwealth of Virginia Department of Taxation, real estate values in Appomattox County increased by some 260 per cent between 1956 and 1970. This represents an average annual increase of 7 per cent; significantly better than the national average of approximately 5 per cent.

In 1956 the assessed value of all privately owned real estate in Appomattox County was \$3,686,749. By 1970 the assessed value had risen to \$9,554,529. The actual assessed values for the 1956-70 period and a curve indicating projected real estate values are shown on Figure II-11.

It is believed that the rapid increase in real estate values has been caused to some extent by the gradual change over of the land from "rural farm" to rural "non-farm". And, is also due to the fact that the land around the Town of Appomattox is rapidly becoming sub-burban in nature.

12. Existing Plans and Planning for Appomattox County

Appomattox County, the Town of Appomattox and Pamplin City have a joint planning commission which initiates and implements planning projects for the County and the Towns. Accomplishments of the

planning commission include:

- (1) Initiating development of a land use plan for the County.
(The resulting report, "Comprehensive Plan, Appomattox Town, Appomattox County and Pamplin City", was developed by the Governor's Office, Division of Planning, in 1966.)
- (2) Joining the Central Virginia Planning Commission which includes Appomattox, Bedford, Amherst and Campbell Counties and is headquartered in Lynchburg.
- (3) Developing a comprehensive water and sewer report for the County in collaboration with the Farmers Home Administration.

The Town of Appomattox has had or is having the following planning work done:

- (1) An Engineering Report on Water and Sewerage was prepared by Hankins and Anderson in 1964. (The Town has generally followed the recommendations of this report whenever improvements are made to the Town water and sewer systems.)
- (2) A Zoning Ordinance for the Town was prepared by the Division of State Planning and Community Affairs. (This was adopted by the Town Council on April 23, 1969.)

(3) Based upon a preliminary review of this Comprehensive Water and Sewer Report for the County, the Town Council on May 24, 1971, authorized Hankins and Anderson to further study the location and design of a proposed treatment plant to serve Appomattox and vicinity.

(4) Foreseeing the need for the extension of services in the near future, the Town has authorized water rate and solid waste disposal studies.

The Town of Pamplin had Hankins and Anderson prepare, in 1969, an Engineering Report on Water and Sewer for the Town. This report was prepared in accordance with requirements of the Farmers Home Administration. Based upon this report and at the request of the Town, the Farmers Home Administration has offered assistance in the development of an adequate public water system for the Town.

No overall economic development program is active in Appomattox County at this time.

B. The Future Situation and Proposed Facilities

1. General

To best serve the purpose of this Report, a design period of 20 years (1970-1990) was chosen. The relatively short design period is used because new patterns of population distribution within the County are just beginning to materialize and there is some doubt that these patterns will continue to evolve in accord with present projections. It is probable that this report should be updated within 10 years in order to verify patterns of population distribution.

2. Population Projections

The Commonwealth of Virginia Division of Planning and Community Affairs predicts that the population of Appomattox County will increase from 9,784 to 11,600 in 1990. It is further anticipated that all of the growth will occur in the Southside District in the immediate vicinity of the Town of Appomattox. The Division of Planning envisions a population of approximately 5000 persons for Appomattox and vicinity by the year 1990. The projected distribution of this population is shown in Figure II-7.

Long range forecasts for the area also predict that growth in the County will be concentrated in the Appomattox area. Division of

Planning population figures for the County during the next 50 years are as follows:

<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>
9784	10,500	11,600	12,800	14,300	16,100

If, as expected, most of this growth occurs in the vicinity of Appomattox, the Town will have a population approaching 10,000 persons.

While total population in both Stonewall and Clover Hill Districts is expected to remain fairly static, it is anticipated that population patterns in these two districts will change. Already in evidence is a trend which finds people moving in from the countryside to nearby highways and small communities. The trend will no doubt be accelerated if public water and/or sewer service are made available along the highways and in several of the larger communities of the County.

3. Future Facilities

No major changes in transportation facilities are proposed in the County for the near future. However, one planned improvement is construction of a Route 460 bypass north of the Town of Appomattox. This proposed change is shown in Figure III-13. A detailed location study has been prepared by the Virginia Department of Highways and has been reviewed by the Town and tentatively approved. Also under consideration is a southerly bypass around Appomattox, however, construction of this road is not definite at this time.

At Pamplin a highway spur connecting the business district with the Route 460 bypass is proposed, however, the project has been delayed for the present.

A new County High School is proposed on Route 727 immediately south of Appomattox (See Figure III-14). Water and sewer for this facility will be provided by the Town of Appomattox. The educational needs of elementary school children can be met by existing facilities located in the Town.

No new health facilities are contemplated at this time. As in the past, the residents will be served by the Lynchburg and Farmville area hospitals. Public health problems will be ministered to by the County Public Health Center at Appomattox which is staffed by nurses, a sanitarium and a public health officer. Private clinics and physicians are available throughout the County. Ambulance and emergency medical service are provided by the Appomattox County Rescue Squad.

It is expected that fire protection will continue to be furnished by volunteer fire companies in Appomattox and Pamplin. As population increases, it seems likely that additional fire fighting equipment and personnel will have to be added to the existing fire companies.

Recreational activities will remain bargely unchanged. No new facilities are planned.

4. Projected Industrial and Commercial Development

Although no large scale industrial development is projected for Appomattox County, there are many fine industrial sites available. For industries which do not require large quantities of process water, sites are available along Route 460 and the Norfolk and Western Railway. Industries which do require large quantities of process water may be located along the James River or its tributaries. The available labor pool in Appomattox County is somewhat limited but would probably be adequate for all but the largest industries.

Commercial development is expected to roughly parallel the population growth. As the area around Appomattox becomes more urbanized, retail and wholesale trade are expected to increase at a slightly accelerated pace.

5. Projected Agricultural Changes

The number of farms in Appomattox County is expected to continue to decline. Of the approximately 450 workers now employed on farms, only 300 are expected to be engaged in farm work by 1980. Since the number of owner operated farms has decreased from approximately 999 in 1950 to approximately 550 in 1970, it is estimated that there will probably be less than 350 owner operated farms in

the County by 1980. It is to be expected that low-grade hardwood forestry products will continue to gain in importance.

6. Future Land Use

Future land use for the County, for the Town of Appomattox and for the Town of Pamplin is examined in some detail in the "Comprehensive Plan, Appomattox Town, Appomattox County and Pamplin City" which was prepared by the Commonwealth of Virginia, Division of Planning, in 1966. The conclusions and recommendations of the Plan still apply.

Future land uses for the County as a whole are indicated on Figure III-10. Most of the land is designated for agricultural or public uses, with small areas set aside for industrial development. The agricultural land is divided into "Agricultural 1" and "Agricultural 2". Agricultural 1 defines those areas to be used for various open uses such as forests, parks, farms, lakes and hills. It is the intent that this land be used primarily for farming. Agricultural 2 defines those areas where urbanization has not occurred and is not likely to occur for some time. This land should be used primarily for forestry, agriculture, hunting preserves and other "open-type" uses.

Future land uses in and around the Town of Appomattox are shown on Figure III-11. The central business district is indicated as remaining at its present location. Residential areas north of Lee-Grant Avenue are shown as "low to medium density" residential and "medium to high density" residential. Residential areas south of Lee-Grant Avenue are shown as "low density agricultural" which indicates some residential development in the future. The Plan calls for the use of large open lots in this area to compensate for lack of water and sewer. Large lots may not be necessary because both water and sewer can be easily made available. A sizable "industrial" area is proposed just west of Appomattox on the south side of Route 460.

Future land uses in and around the Town of Pamplin are shown on Figure III-12. An industrial area is proposed along both sides of U. S. Route 460. Other than this, most of the Town is designated as residential.

7. Proposed Water System

In viewing a proposed water system to serve the County it was recognized that, because of the low average density of population (28 persons per square mile), it would not be financially feasible to install a system which could serve all of the County. It is apparent that those places which could best afford a public water

system were the larger communities in the County. Figure IV-1 shows that all of the larger communities in the County are located in the central portion of the County and with the exception of Oakville and Vera all of them are located along or adjacent to U. S. Route 460. Oakville and Vera are located on State Routes 26 and 24 respectively and each is approximately five miles from Appomattox. Bench mark elevations in the communities (Concord, Spout Spring, Appomattox, Evergreen, Pamplin, Vera and Oakville) indicate that they all are remarkably close to the same elevation and could easily be supplied from a central supply system. The Town of Appomattox is located near the geographic center of this group of communities and data on existing wells indicates that Appomattox probably has the best ground water supplies available in the County. The overflow at the "high-level" Appomattox elevated tank is 997 feet above sea level and is therefore capable of delivering water at adequate pressure by gravity to any of the six communities outside of Appomattox. Maximum static pressures to each of the communities would be approximately as follows:

<u>Town</u>	<u>B.M.Elev.</u>	<u>Max. Static Press.</u>
Concord	837	69 psi
Spout Spring	855	61 psi
Evergreen	749	107 psi
Pamplin	691	132 psi
Oakville	748	108 psi
Vera	825	74 psi

Since it is not desirable for building system pressures to exceed 75 psi, it is apparent that system pressures in Evergreen, Pamplin and Oakville should be regulated or controlled. This can easily be done with regulating devices, hydropneumatic tanks or elevated tanks.

The number of customers which could be served by the water system shown on Figure IV-1 has been established by field investigation and population projections. The approximate figures are as follows:

<u>Location</u>	<u>No. of Services</u> (1970 Potential)	<u>No. of Services</u> (1990 Potential)
Concord	156	156
Rte 460 (Concord-Spt.Spr.)	20	56
Spout Spring	53	53
Rte 460 (Spt.Spr.-Appo.)	55	90
Appomattox & Vicinity	840	1660
Rte 460 (Appo.-Evergreen)	28	60
Evergreen	60	60
Rte 460 (Evergreen-Pamp.)	35	100
Pamplin	175	175
Rte 24 (Appo.-Vera)	10	50
Vera	48	48
Rte 26 (Appo.-Oakville)	20	100
Oakville	<u>50</u>	<u>50</u>
Total No. Services	1550	2658
No. of Persons @ 3 per serv.=	4650	7974
Per Cent of County Popul. =	47.5%	68.7%

From the above it can be seen that by providing service to some 5.2 per cent (18 square miles) of the County's area, water may be supplied to 68.7 per cent of the County's population. Of those supplied, some 3000 persons would live outside of the urbanized Appomattox area.

Maximum water demand to provide for 7974 customers will by 1990 equal close to 1,000,000 gallons per day which is equivalent to approximately 695 gallons per minute for 24 hours. If the supply is to be taken from wells, the capacity of the wells should be approximately double the demand or 1400 gallons per minute.

It is recommended that wells be used as the source of supply as long as adequate supplies can be found. Little is known about the useful life of wells in Appomattox County and less is known about the availability of wells which can meet the demands envisioned above. As a safety precaution it probably would be wise to do some preplanning on a suitable surface water supply.

Storage requirements for the system should provide a minimum of two days of emergency domestic supply or a minimum fire demand (for a community of 6000 persons) of 2500 gallons per minute for 10 hours. These figures may vary somewhat depending upon a number of variables. As an absolute minimum for the proposed system, one million gallons of storage should be provided and

two million gallons would be desirable. Two alternate locations for storage tanks are shown on Figure IV-2. The location shown north of Appomattox on Route 26 is the more desirable because the tank could be a ground level tank located on high ground and would in effect be an elevated tank. The tank shown located within the corporate limits adjacent to Route 460 would be a pumped ground level tank. The existing 100,000 gallon elevated tank would be maintained in service as an equalizing tank.

Since this Report calls for the Town of Appomattox water system to be expanded to form the basis for the County system, it will be necessary to strengthen supply, distribution piping and storage capacity before major expansion outside of the Town takes place.

A Proposed Water Distribution Plan for the Town of Appomattox and Vicinity is shown in Figure IV-2. The proposed improvements within the corporate limits largely follow the key recommendations of the Town's 1964 Engineering Report. Some of the recommendations were as follows:

(For more detailed information see "Town of Appomattox Engineering Report".)

- (1) Inter-connect the "high" and "low-level" systems.
- (2) Remove the existing 30,000 gallon "low-level" tank.

- (3) Abandon the existing booster station which pumps from "low-level" to "high-level".
- (4) Strengthen the existing distribution system as shown on Figure IV-2.
- (5) Retain the existing 100,000 gallon storage tank to "float" on the Town System.
- (6) Drill additional wells for supply so that existing wells will not be overpumped.
- (7) Provide additional storage capacity to provide for peak flows, emergency supplies and fire protection.

Proposed improvements to the water system outside of the corporate limits of Appomattox are also shown in Figure IV-2. These improvements include extending water service into those areas which are presently developed. It is proposed that most of this work be complete by 1975. Improvements which are proposed to be complete by the year 1990 include; (1) the loop mains which are shown generally around the perimeter of the line marked "Probable Future Development 1990" and, (2) the mains shown extending outward along the highways to serve Concord, Spout Spring, Oakville, Evergreen, Pamplin and Vera. The proposed work which should be complete in 1990 is shown in yellow on Figure IV-1.

A Proposed Water System For Pamplin City is shown in Figure IV-4.

While Figure IV-1 shows Pamplin City as a part of the County water system, it is recommended here that the Town system shown be constructed at once. It seems likely that the Pamplin connection would be one of the last (prior to 1990) to be made due to the scarcity of potential service connections along this section of Route 460. This could mean that Pamplin would be without a water system until 1990 or even later. This would cost the Town significantly in growth opportunities and increased property values.

If the Pamplin water system is constructed now, the County system may connect to it later and thus replace the Town wells as a source of Supply. The static pressure in the County main will be too great to make a direct connection into the Town system without some form of pressure reduction. However, by entering the Town system through an altitude valve at the proposed 75,000 gallon elevated tank, the problem of excess static pressure could be overcome.

Proposed water systems for Concord, Evergreen, Oakville, Spout Springs and Vera are shown in Figures IV-6, IV-7, IV-8, IV-9 and IV-10 respectively. These drawings are little more than schematics which were developed to determine the scope and magnitude of the problem. It is intended that the work of constructing

these systems be completed sometime prior to 1990. It is likely that these systems would be constructed as part of the work of extending mains from Appomattox out along the highways to the outlying communities. If, in the meantime, private wells in the communities fail, a system may be constructed in accord with these drawings so as not to preclude the possibility of assimilating the piping into the County distribution network at a later date.

8. Proposed Sewer System

A thorough investigation of the potential for a county sewage collection and treatment system has led to the conclusion that only in Appomattox and Pamplin is such a system feasible. Figure IV-1 shows the areas which were considered for sewage collection and treatment. Differences in elevation and relatively low density housing both combine to make sewage collection and transport to Appomattox from the outlying communities of Concord, Spout Spring, Evergreen, Oakville and Vera a near impossibility from a cost standpoint. Relatively large lift stations and long force mains would be required to accomplish this. It is recommended that the five communities listed above continue to use septic tanks for the duration of the design period (1970-1990) of this report. If septic tanks fail, it would probably be best to install individual treatment plants of the package type for each community

rather than pump into a county system. Schematic sewage collection systems are shown for Concord, Evergreen, Oakville, Spout Springs and Vera, Virginia on Figures IV-6 thru IV-10.

A sewage collection and treatment system for Appomattox and vicinity is entirely feasible. Figure IV-3 shows a proposed system for Appomattox and environs. It is believed that the arrangement shown would serve approximately 850 customers at present and that by 1990 this could be expected to increase to approximately 1660 customers (5000 persons). Thus, the proposed system would serve approximately 44.5 per cent of the County's projected 1990 population.

The existing sewage collection system of the Town of Appomattox would form the nucleus of the proposed collection system. The existing system would continue to serve all of that area within the corporate limits.

A single new treatment plant, providing at least secondary treatment, should treat all sewage collected from Appomattox and vicinity. Existing treatment facilities, including both the trickling filter plant and the sewage, lagoon should be abandoned completely. It is probable that the new plant should be located a considerable distance south along Purdom's Branch from the existing plant site. This site was chosen in order to use the Town's existing

collection system to best advantage. To move the plant into another drainage basin would require the installation of additional pumping facilities. Since the plant is expected to provide service for some 5000 persons by 1990, it should have a capacity of approximately $5000 \times 100 \times 1.3 = 650,000$ gallons per day. Enough flexibility should be designed into the plant to allow for increasing the capacity of the plant in the future. The treatment facility should be constructed as soon as possible.

The proposed sewage collection system will involve the use of gravity interceptors, sewage lift stations and force mains to collect and deliver sewage from the newly expanding area northeasterly of Appomattox to the proposed treatment plant site. It will be necessary to construct pump stations and force mains early in the construction sequence in order to have service available to the developing area. Service should be made available before septic tanks or other systems are installed. The gravity interceptors should be installed on an "as needed basis".

The new areas south and west of Appomattox can in most cases be drained by gravity flow. These sewers may be installed "as needed".

The proposed system may be expanded to encompass other areas not shown on the drawings. Actual growth may differ somewhat from projected growth.

A proposed sewer system for Pamplin City is shown on Figure IV-5. This drawing is taken from "Town of Pamplin City, Engineering Report on Water Supply System and Sewerage System" and shows the sewage system recommended in that report. It is doubtful that the two cell lagoon would be an acceptable form of sewage treatment now that stream standards have increased so drastically. However, the system shown is generally that which is recommended.

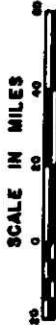
The Town of Pamplin badly needs a sewage collection and treatment system as a 1964 study made by the Appomattox County Health Department testifies. The installation of sewage collection and treatment could be financially feasible if sufficient assistance were available in the form of a grant. There are approximately 135 services to be connected to the system.

VIRGINIA

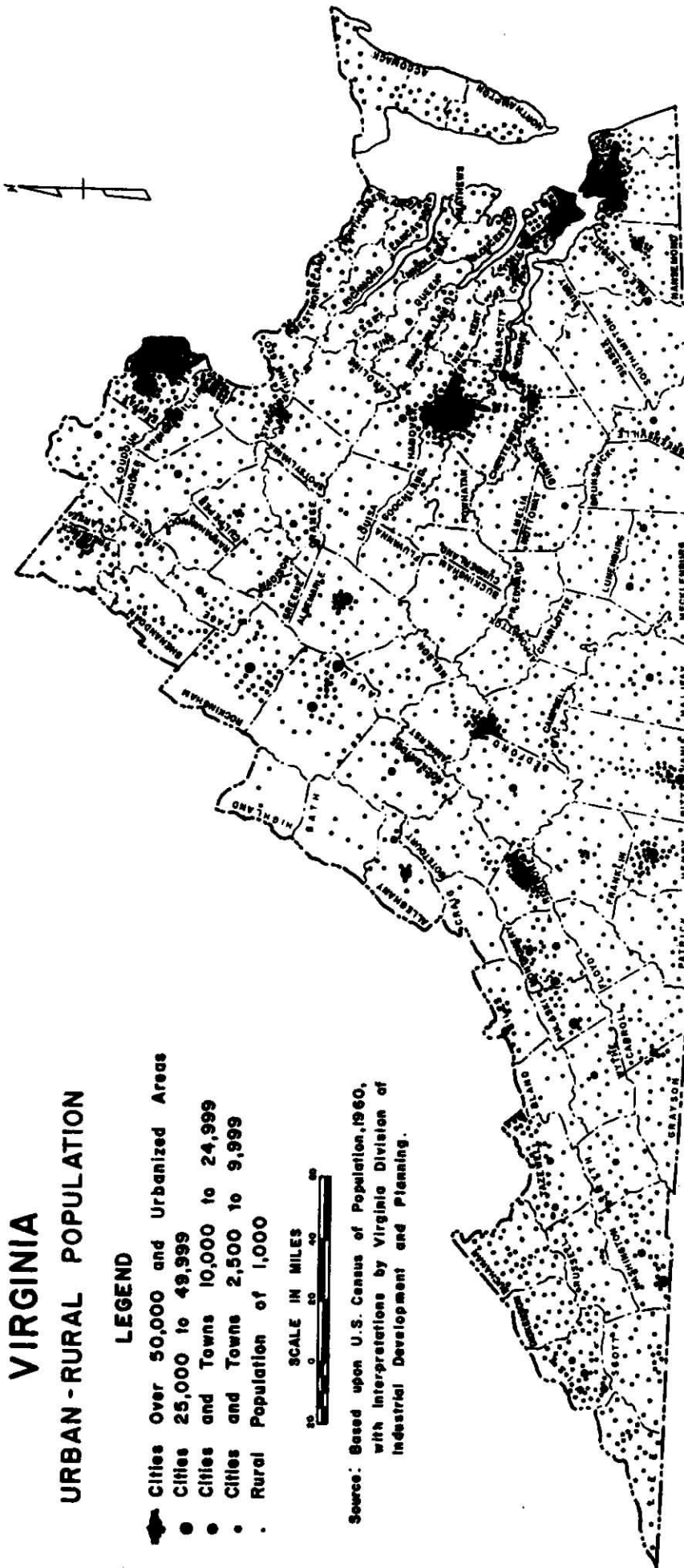
URBAN-RURAL POPULATION

LEGEND

- Cities Over 50,000 and Urbanized Areas
- Cities 25,000 to 49,999
- Cities and Towns 10,000 to 24,999
- Cities and Towns 2,500 to 9,999
- Rural Population of 1,000



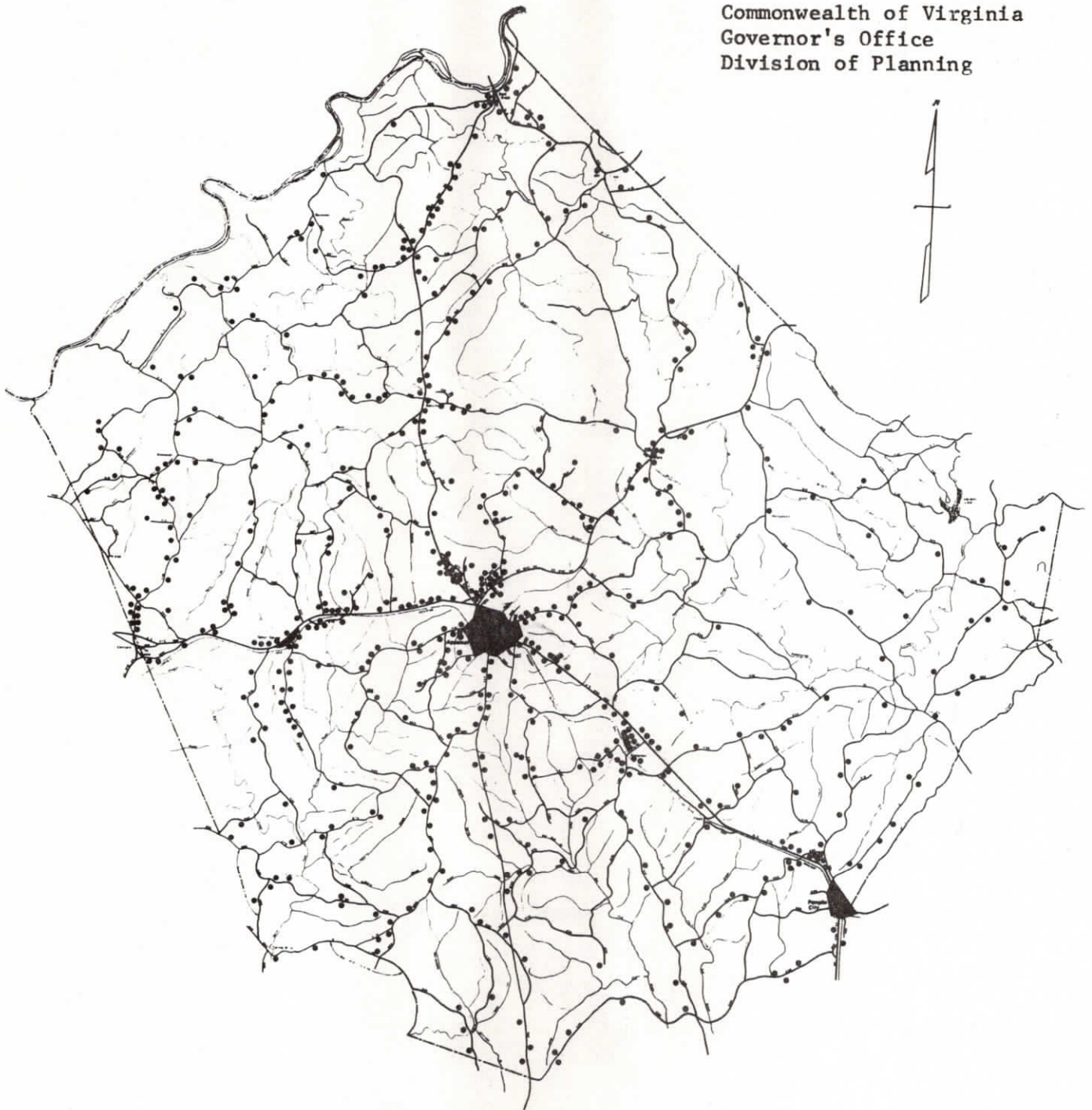
Source: Based upon U.S. Census of Population, 1960,
with interpretations by Virginia Division of
Industrial Development and Planning.



This Exhibit taken from:
COMPREHENSIVE PLAN
APPOMATTOX TOWN, APPOMATTOX
COUNTY AND PAMPLIN CITY
 Commonwealth of Virginia
 Governor's Office
 Division of Planning

Figure II-2

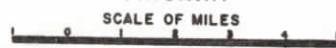
This Exhibit taken from:
COMPREHENSIVE PLAN
APPOMATTOX TOWN, APPOMATTOX
COUNTY AND PAMPLIN CITY
Commonwealth of Virginia
Governor's Office
Division of Planning



ONE DOT REPRESENTS FIFTEEN PERSONS

EXISTING
POPULATION DISTRIBUTION

APPOMATTOX COUNTY
VIRGINIA



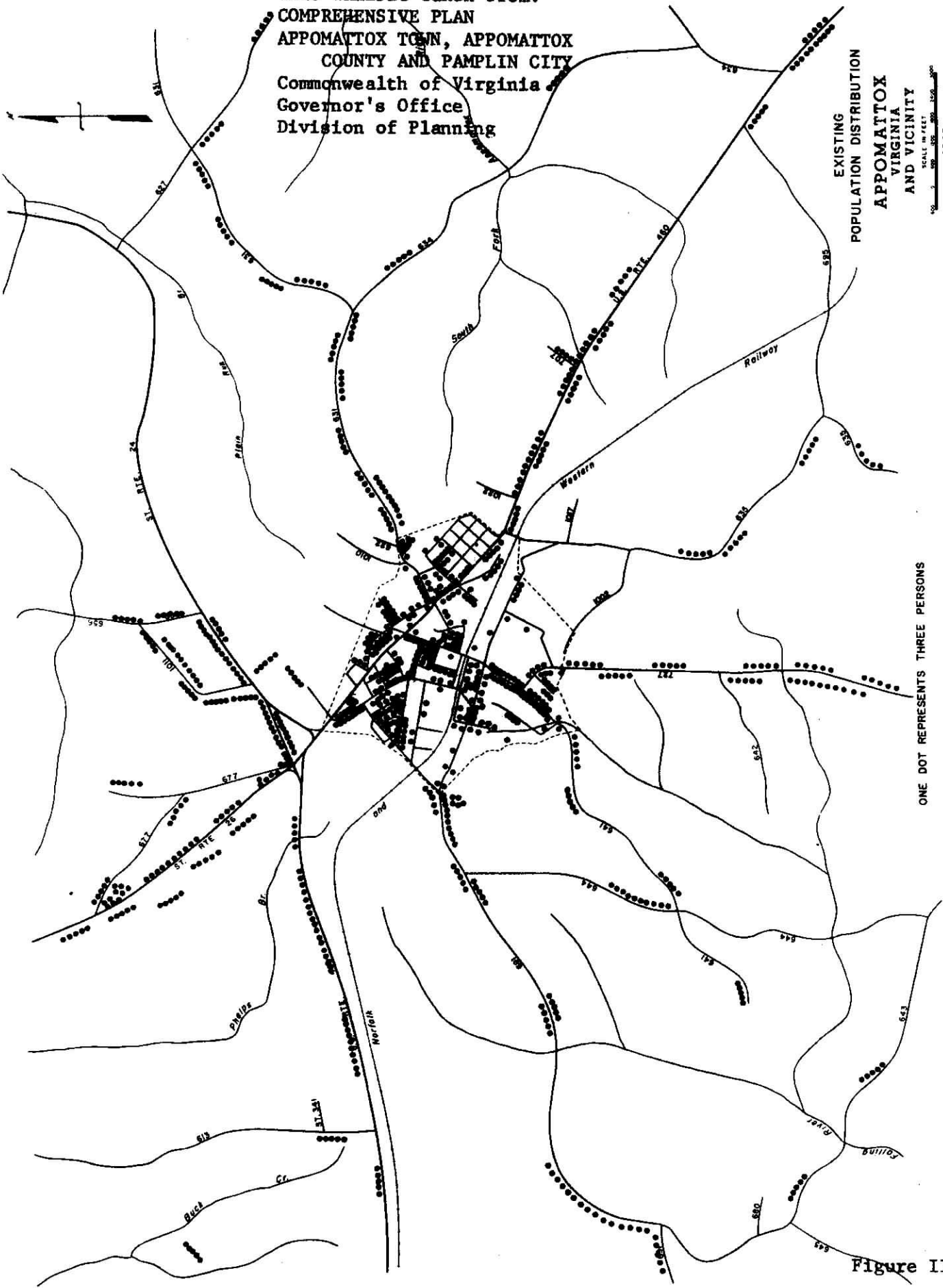
1965

Figure II-3

This Exhibit taken from:
COMPREHENSIVE PLAN
APPOMATTOX TOWN, APPOMATTOX
COUNTY AND PAMPLIN CITY
Commonwealth of Virginia
Governor's Office
Division of Planning

EXISTING
POPULATION DISTRIBUTION
APPOMATTOX
VIRGINIA
AND VICINITY

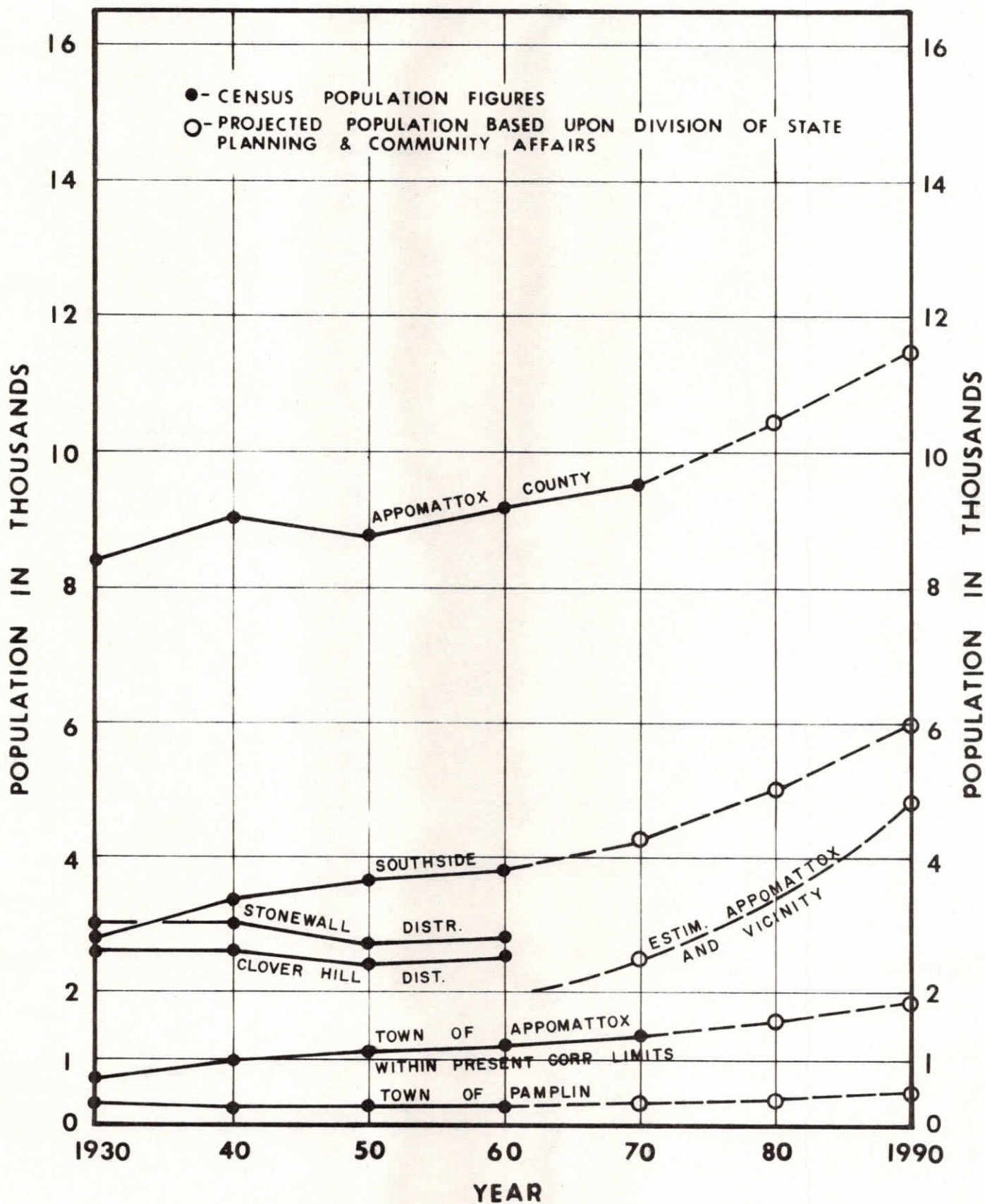
SCALE IN FEET
1965



ONE DOT REPRESENTS THREE PERSONS

Figure II-4

POPULATION TRENDS AND PROJECTIONS 1930 - 1990



NOTE:

FIGURES SUPPLEMENTED BY 1970 CENSUS FIGURES

**PERCENTAGE CHANGES IN POPULATION
1930 - 1970**
(BASED UPON 1930 POPULATION INDEX = 100%)

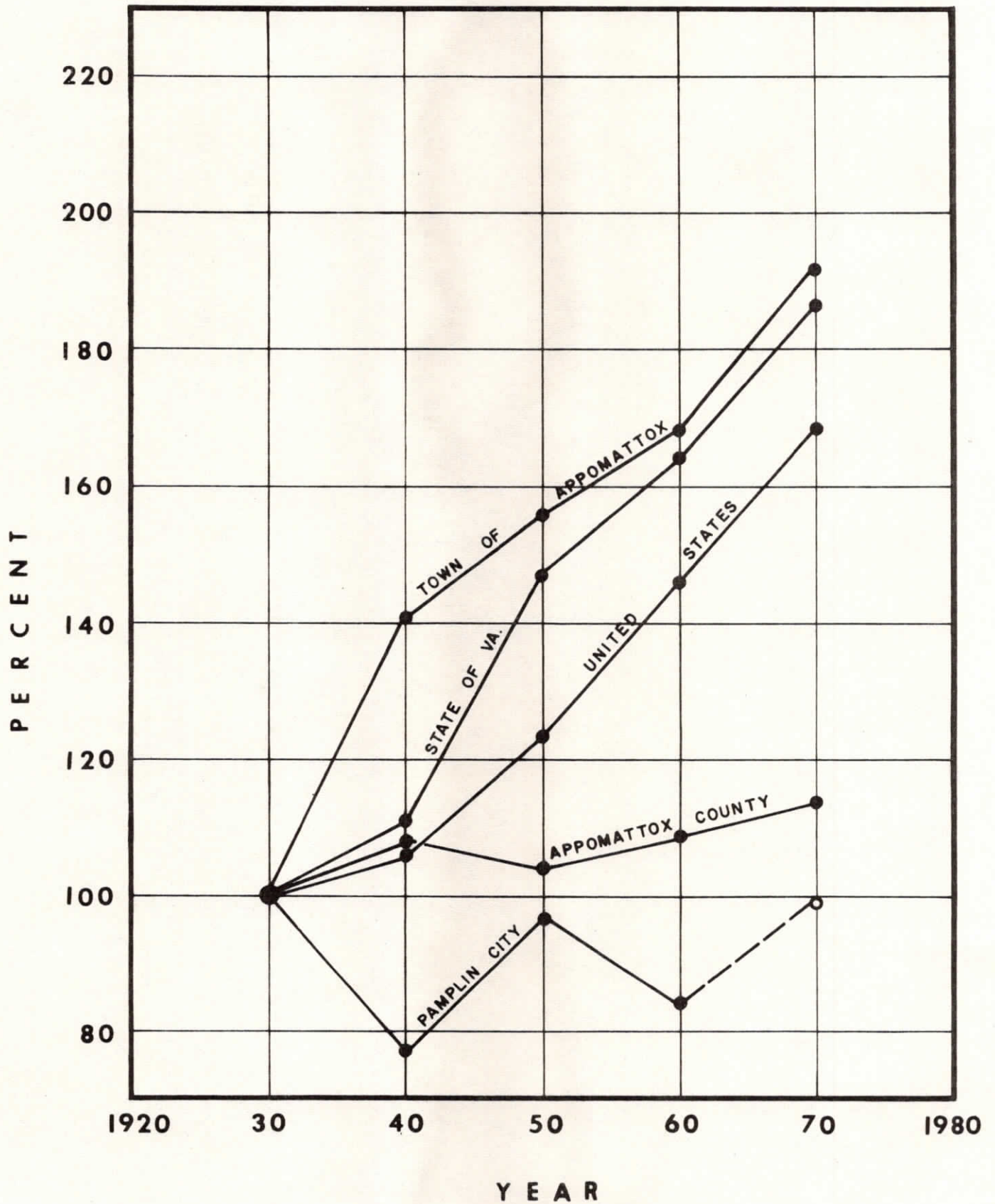


FIGURE II-6

This Exhibit taken from:
COMPREHENSIVE PLAN
APPOMATTOX TOWN, APPOMATTOX
COUNTY AND PAMPLIN CITY
Commonwealth of Virginia
Governor's Office
Division of Planning



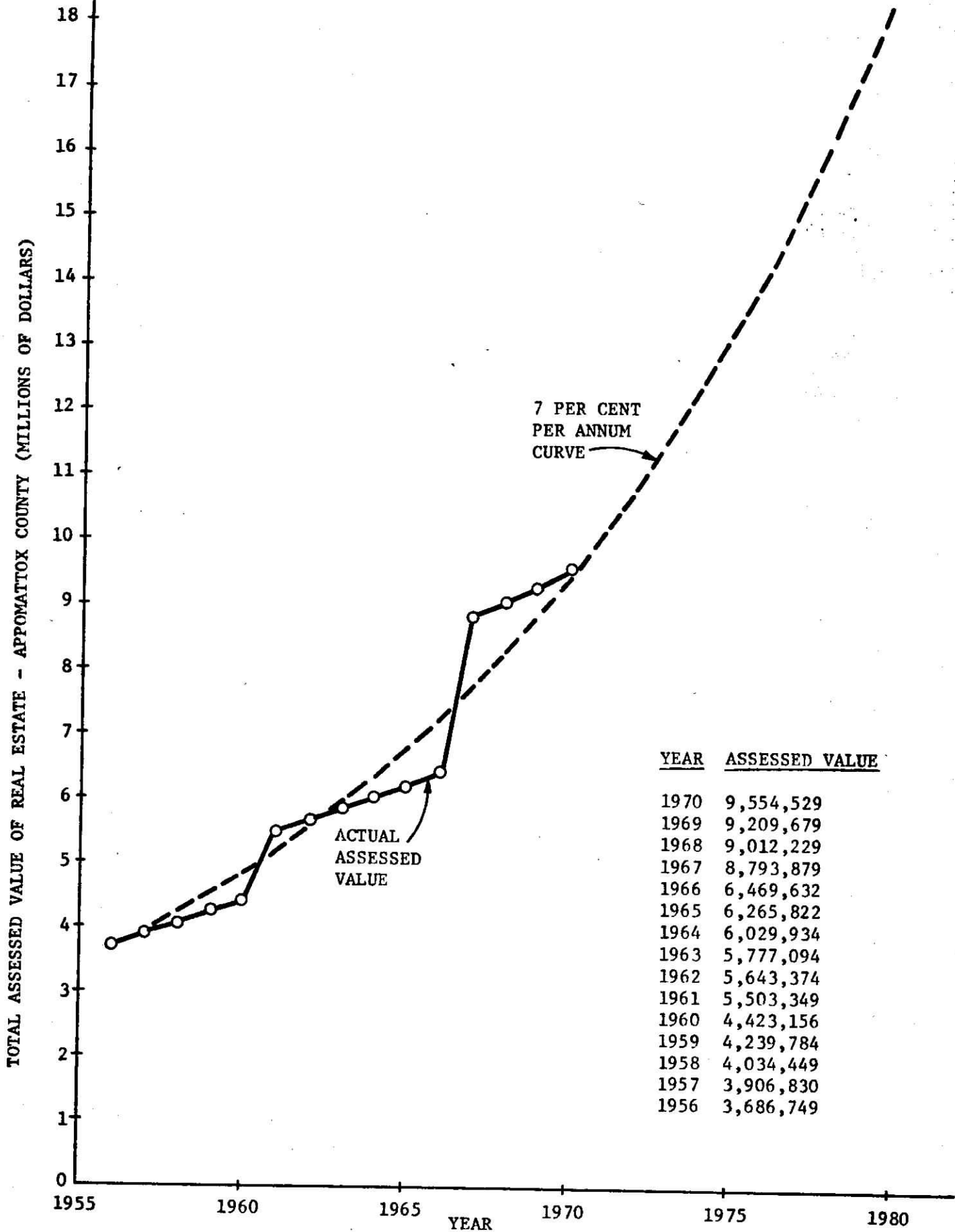
FUTURE
POPULATION DISTRIBUTION
APPOMATTOX
VIRGINIA
AND VICINITY

SCALE IN FEET
0 100 200 300 400 500

1990

ONE DOT REPRESENTS THREE PERSONS

Figure II-7

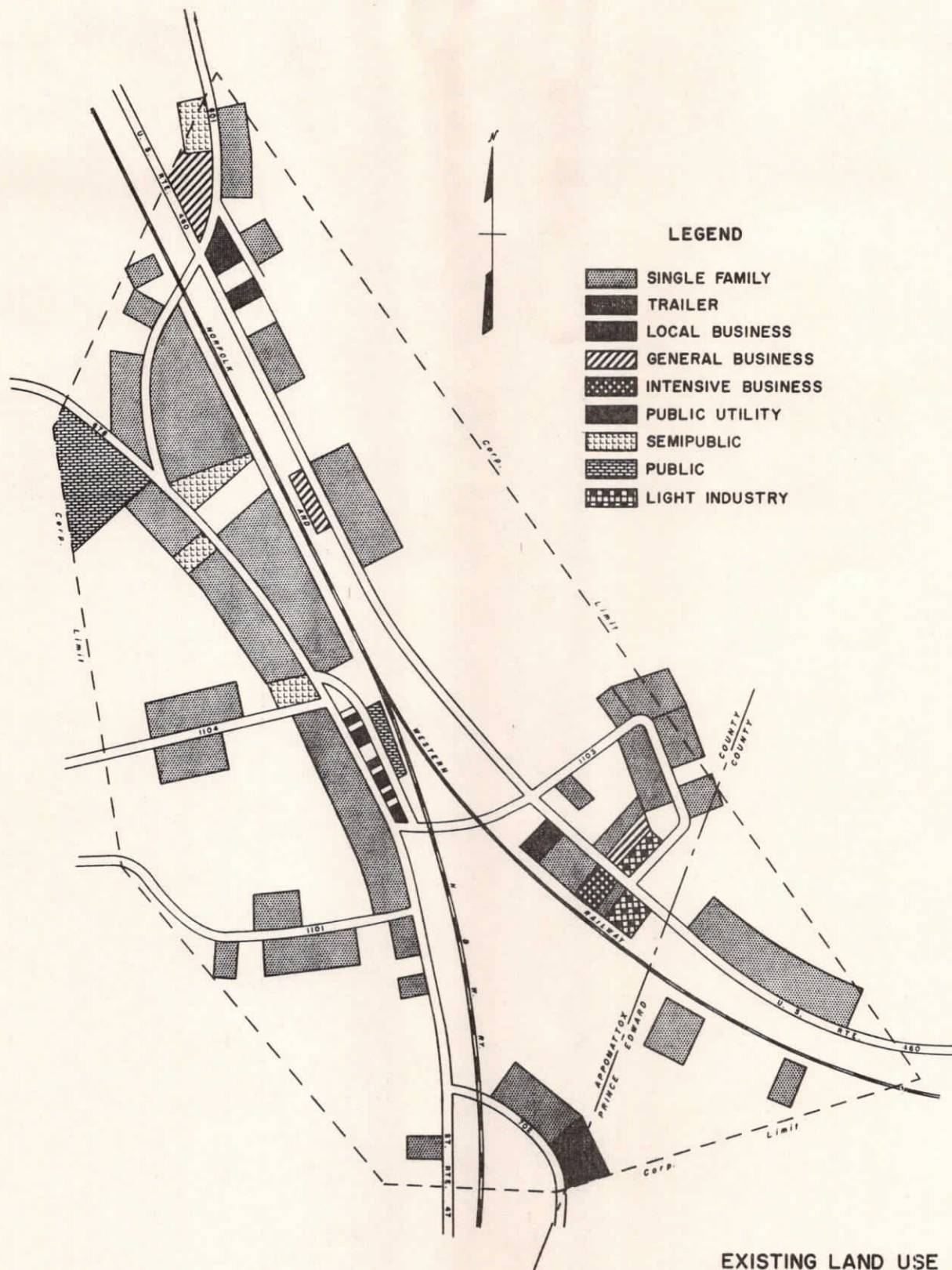


TOTAL ASSESSED REAL ESTATE VALUES IN APPOMATTOX COUNTY
 BASED UPON COMMONWEALTH OF VIRGINIA - DEPARTMENT OF TAXATION - RESEARCH

MAPS SHOWING PRESENT AND FUTURE CONDITION

FIGURE III-1	MAP OF APPOMATTOX COUNTY
FIGURE III-2	TOPOGRAPHIC MAP OF APPOMATTOX COUNTY
FIGURE III-3	GENERAL SOILS MAP APPOMATTOX COUNTY
FIGURE III-4	ELECTRIC POWER AND TELEPHONE
FIGURE III-5	EXISTING LAND USE - APPOMATTOX
FIGURE III-6	EXISTING LAND USE - PAMPLIN
FIGURE III-7	EXISTING WATER DISTRIBUTION - APPOMATTOX
FIGURE III-8	EXISTING SANITARY SEWER SYSTEM - APPOMATTOX
FIGURE III-9	EXISTING WATER SYSTEM - PAMPLIN
FIGURE III-10	FUTURE LAND USE - APPOMATTOX COUNTY
FIGURE III-11	FUTURE LAND USE - APPOMATTOX
FIGURE III-12	FUTURE LAND USE - PAMPLIN
FIGURE III-13	FUTURE STREETS AND HIGHWAYS - APPOMATTOX
FIGURE III-14	SCHOOLS AND RECREATION - APPOMATTOX

Note FIGURE III-1 and FIGURE III-7 are available as full scale drawings if needed for planning purposes.



This Exhibit taken from:
 COMPREHENSIVE PLAN
 APPOMATTOX TOWN, APPOMATTOX
 COUNTY AND PAMPLIN CITY
 Commonwealth of Virginia
 Governor's Office
 Division of Planning

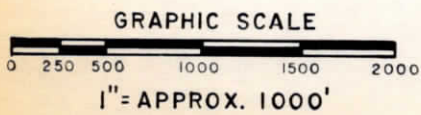
**EXISTING LAND USE
 PAMPLIN, VIRGINIA**

SCALE IN FEET
 0 200 400 600 800 1000
1965
 DIVISION OF INDUSTRIAL DEVELOPMENT AND PLANNING

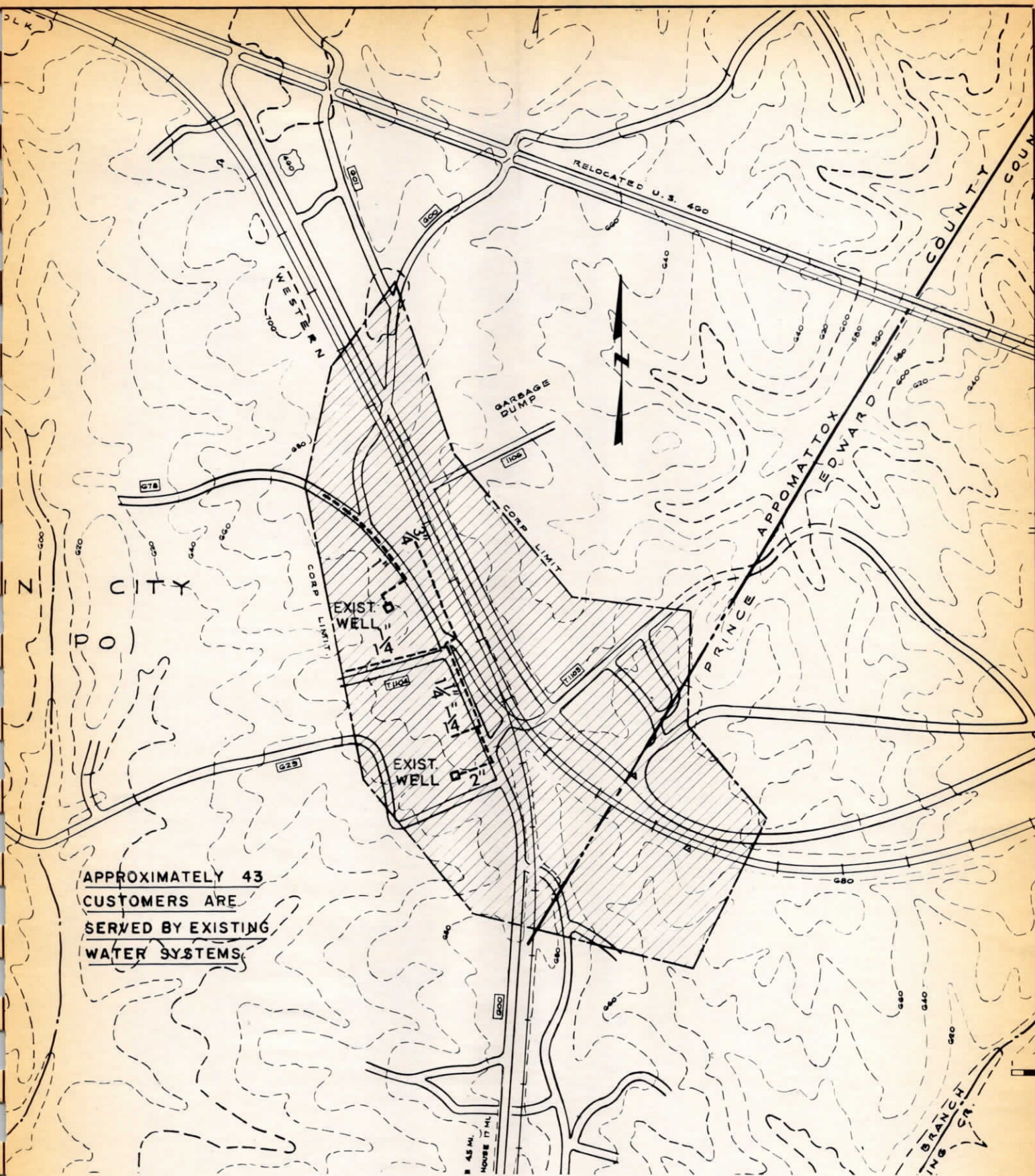
Figure III-6



EXISTING
 SANITARY SEWER SYSTEM
 FOR
 TOWN OF APPOMATTOX



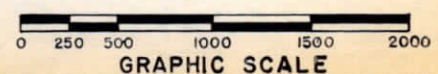
PREPARED BY
 HANKINS & ANDERSON

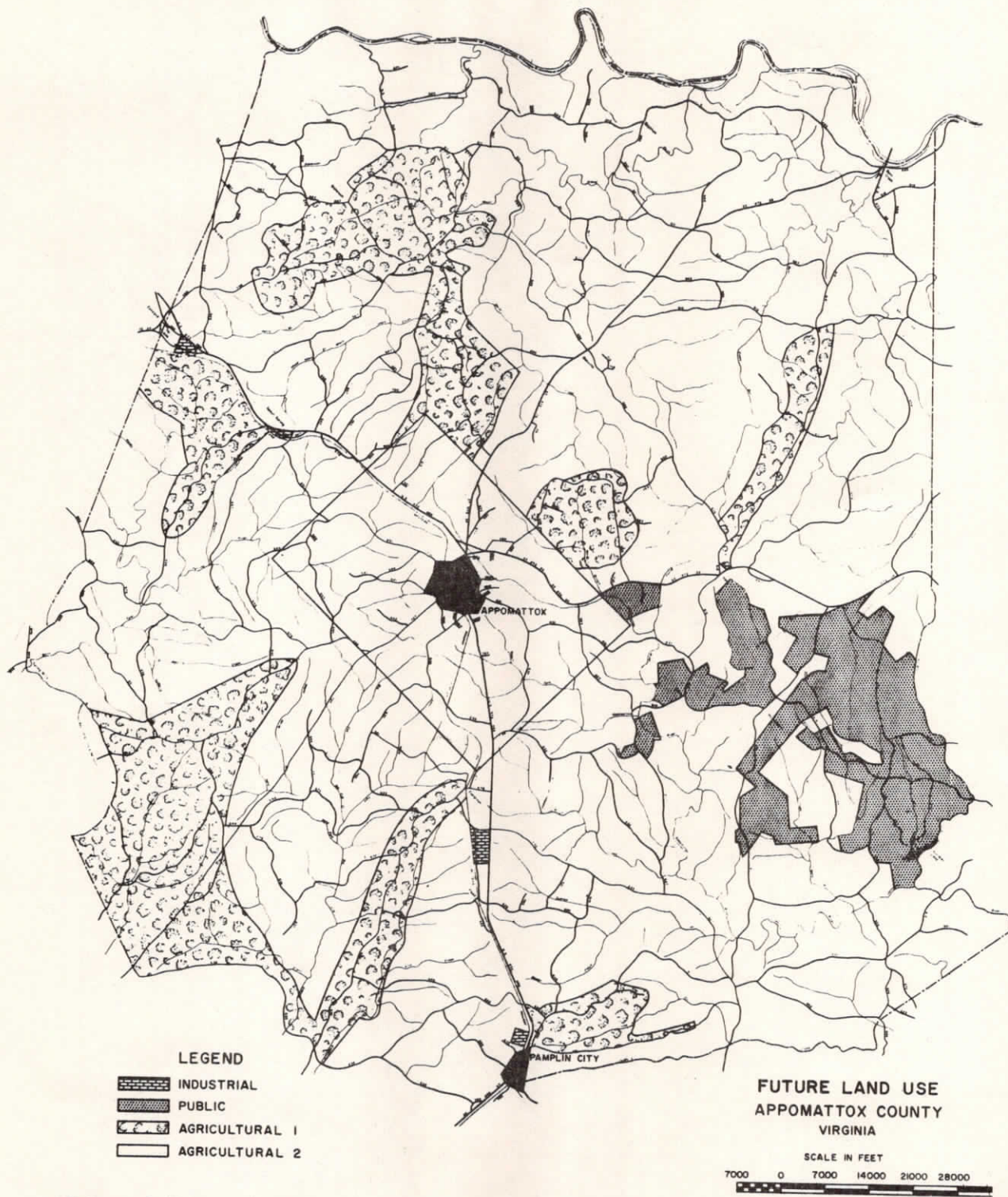


APPROXIMATELY 43
CUSTOMERS ARE
SERVED BY EXISTING
WATER SYSTEMS.

NOTE:
INFORMATION SHOWN HEREON WAS
TAKEN FROM "TOWN OF PAMPLIN CITY
PRELIMINARY ENGINEERING REPORT"
DATED NOVEMBER, 1968.

**EXISTING WATER SYSTEM
 FOR
 PAMPLIN CITY**





This Exhibit taken from:
 COMPREHENSIVE PLAN
 APPOMATTOX TOWN, APPOMATTOX
 COUNTY AND PAMPLIN CITY
 Commonwealth of Virginia
 Governor's Office
 Division of Planning

Figure III-10

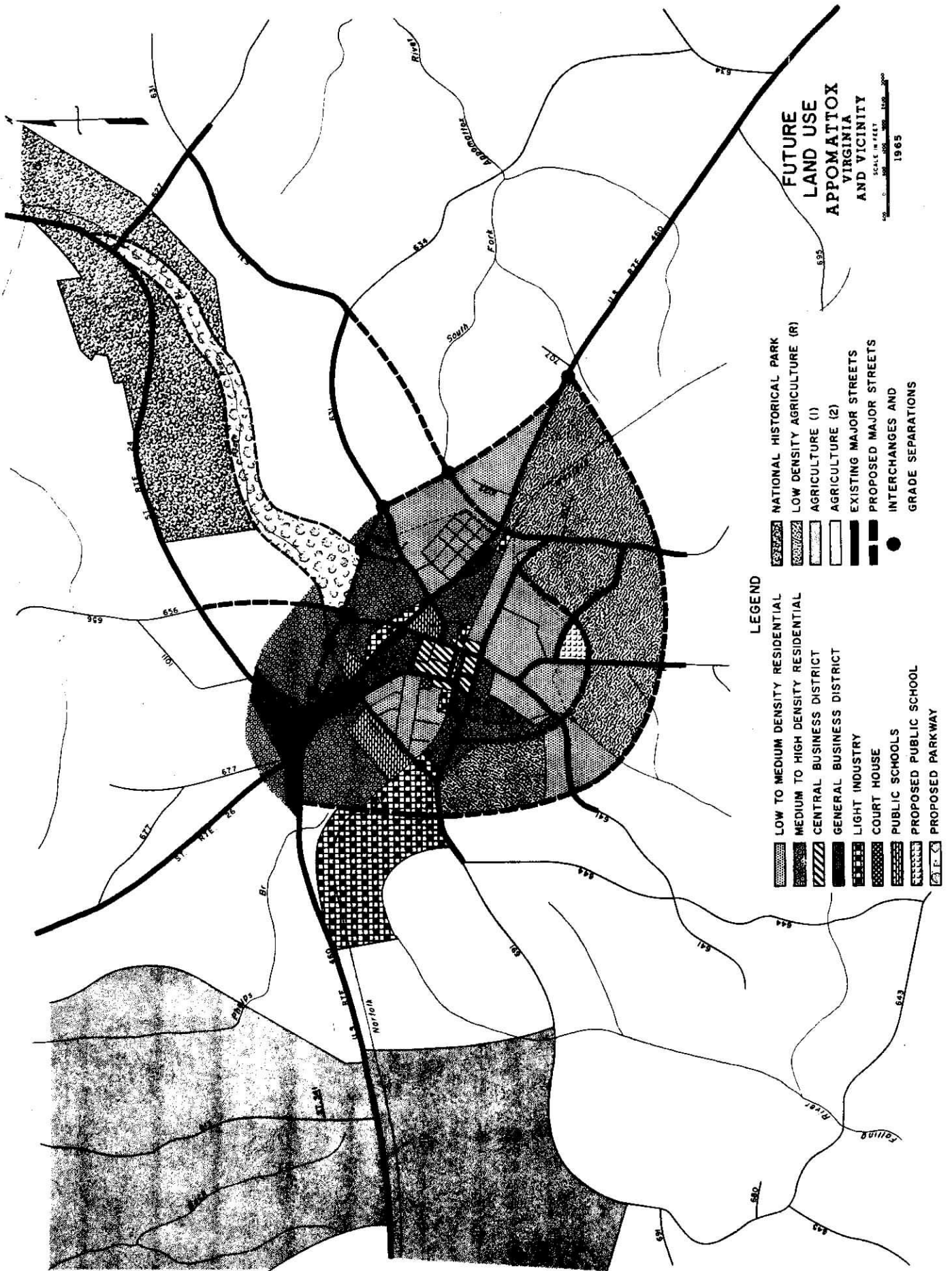
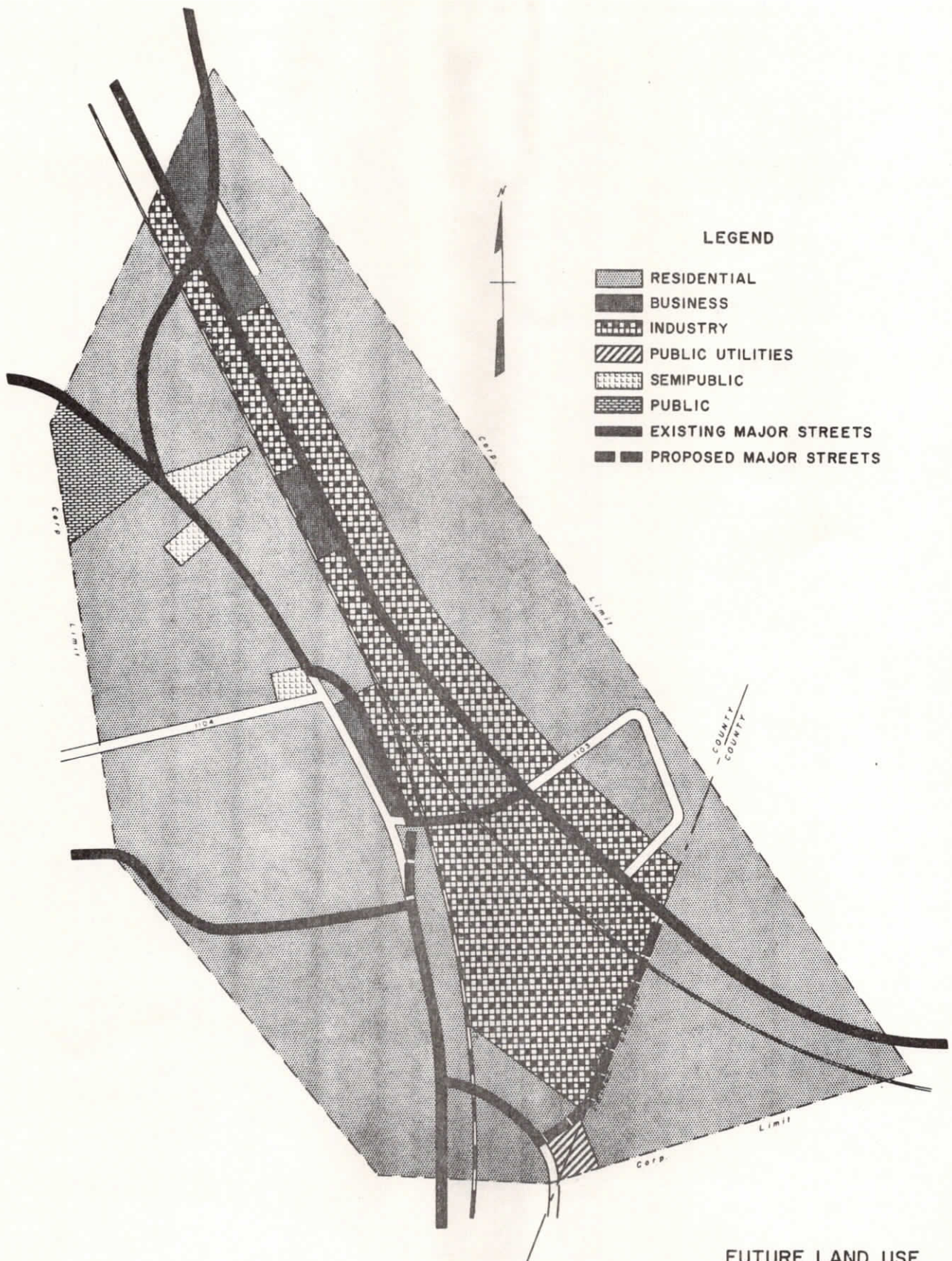










Figure III-11



LEGEND

-  RESIDENTIAL
-  BUSINESS
-  INDUSTRY
-  PUBLIC UTILITIES
-  SEMIPUBLIC
-  PUBLIC
-  EXISTING MAJOR STREETS
-  PROPOSED MAJOR STREETS

**FUTURE LAND USE
PAMPLIN, VIRGINIA**

SCALE IN FEET
0 200 400 600 800 1000

1965

DIVISION OF INDUSTRIAL DEVELOPMENT AND PLANNING

Figure III-12

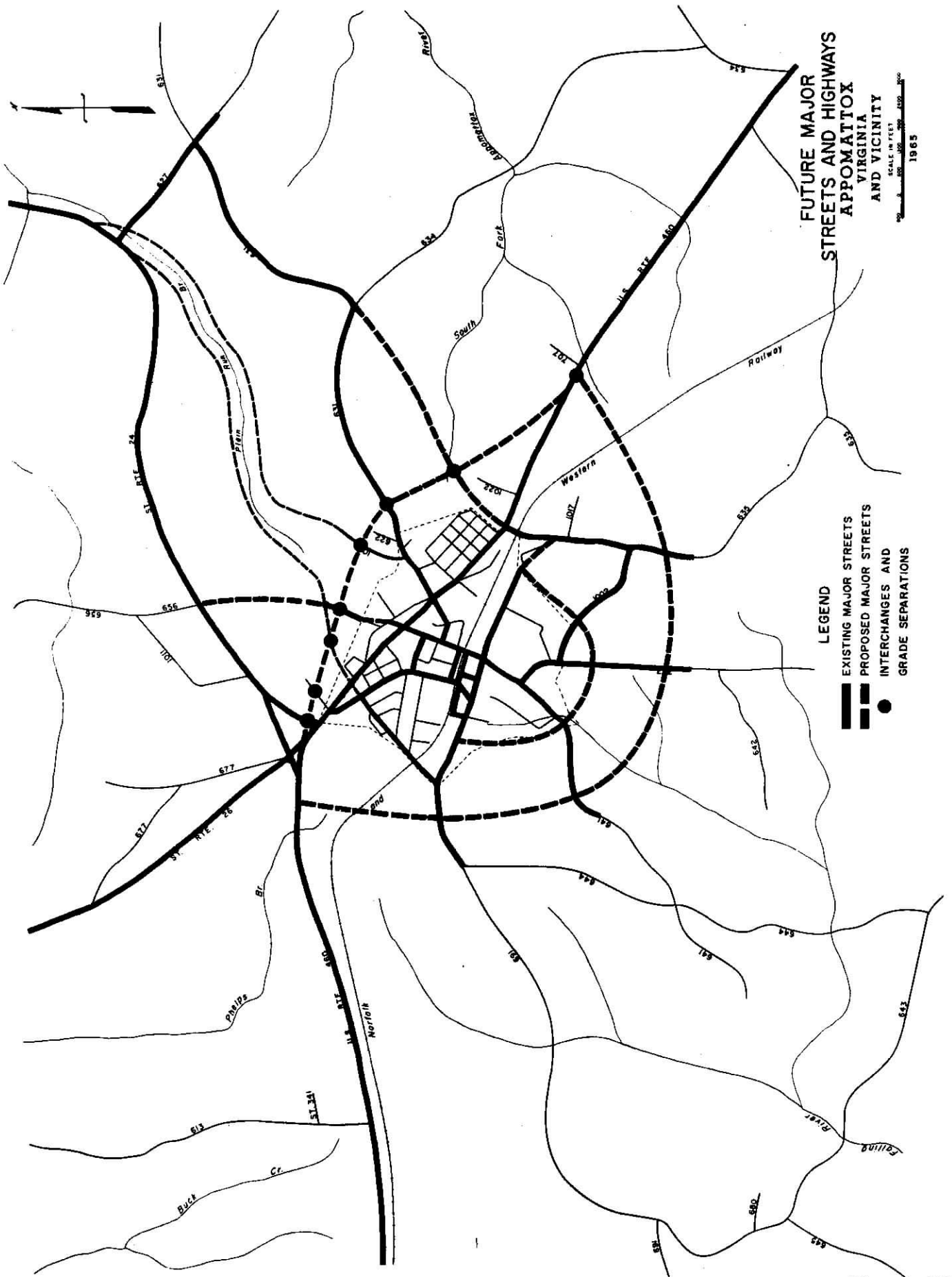


Figure III-13

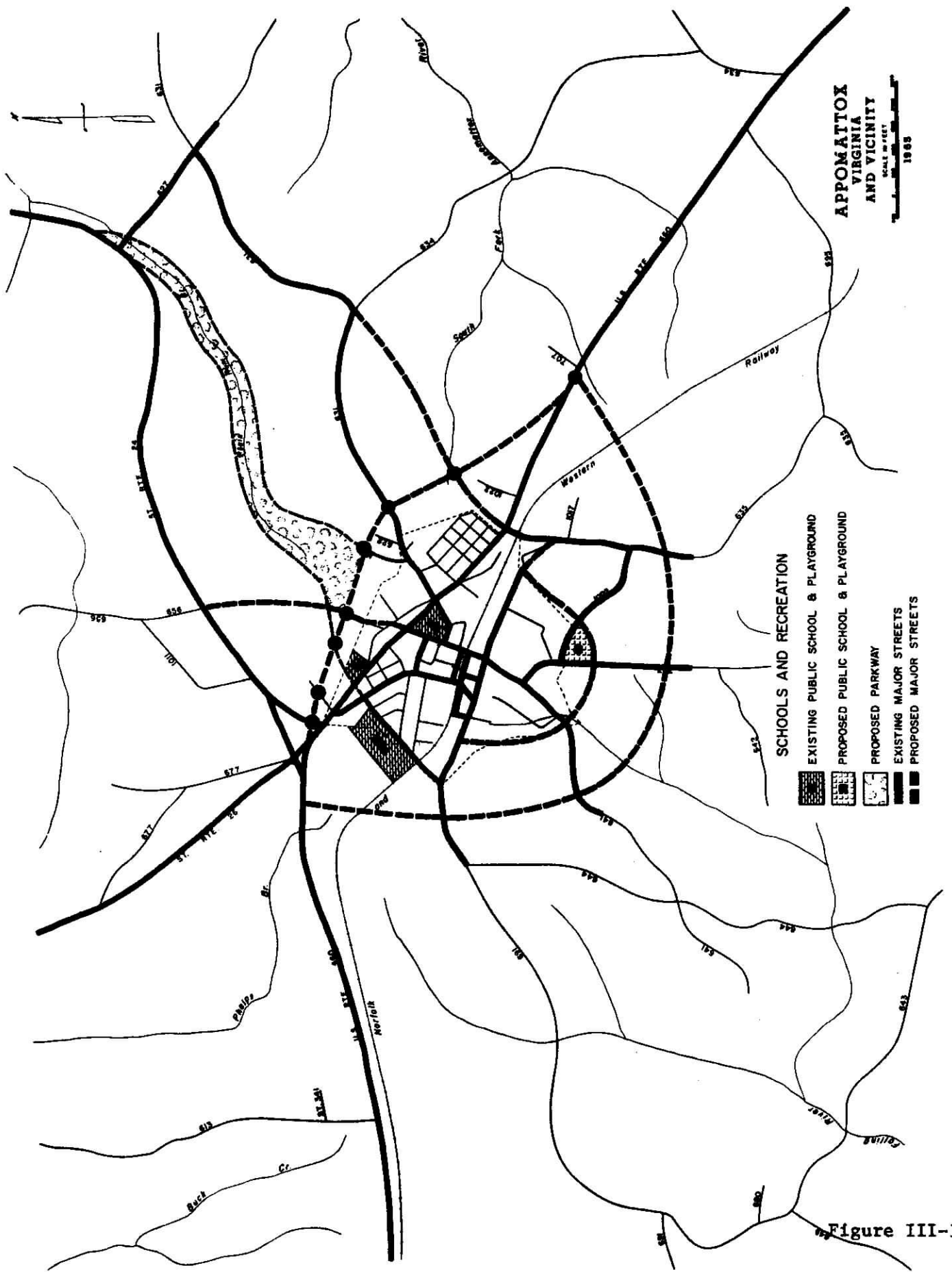


Figure III-14

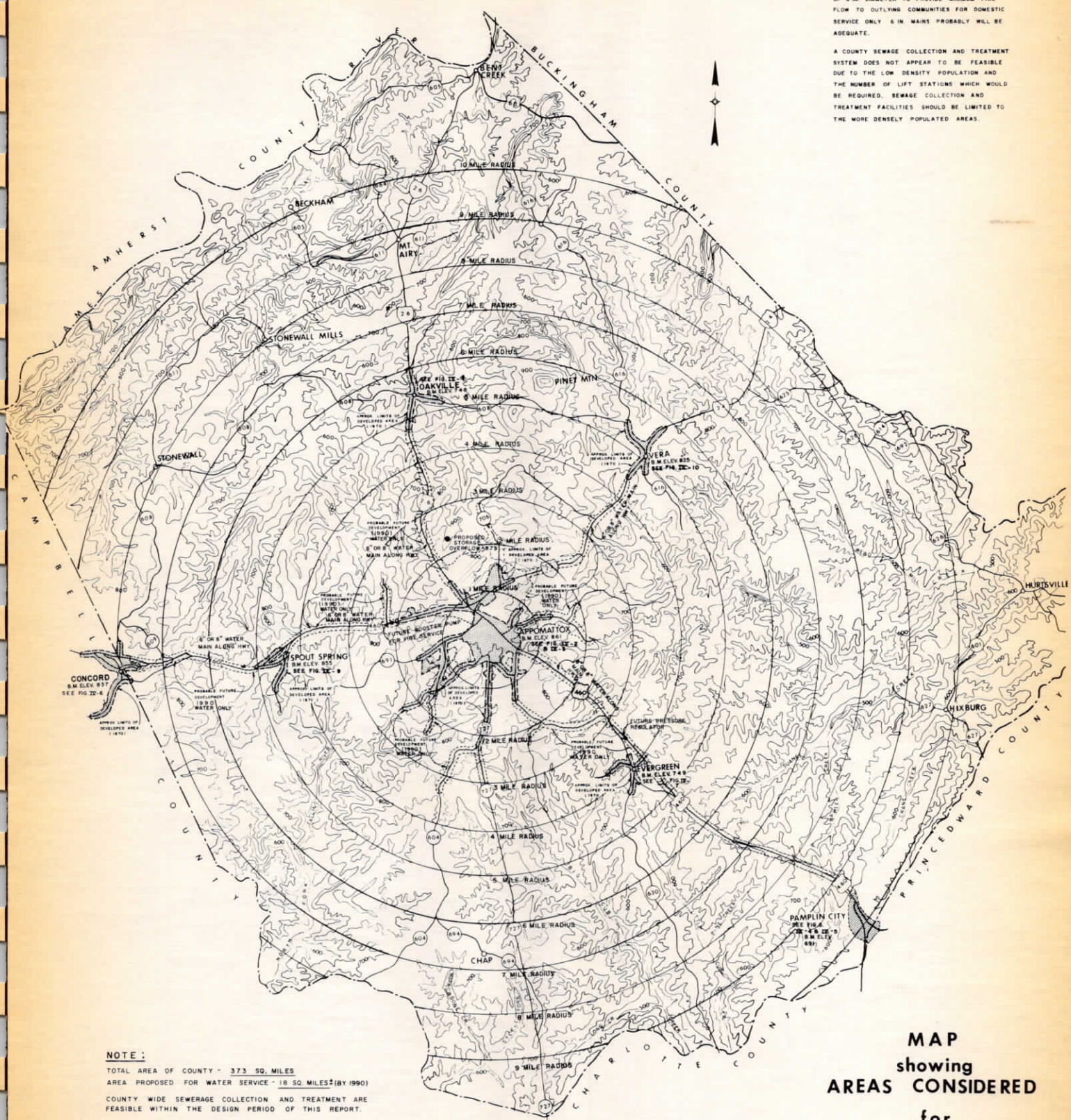
IV. MAPS SHOWING PROPOSED WATER AND SEWER

FIGURE IV-1	AREAS CONSIDERED FOR WATER AND SEWER
FIGURE IV-2	PROPOSED WATER DISTRIBUTION - APPOMATTOX
FIGURE IV-3	PROPOSED SANITARY SYSTEM - APPOMATTOX
FIGURE IV-4	PROPOSED WATER SYSTEM - PAMPLIN
FIGURE IV-5	PROPOSED SEWER SYSTEM - PAMPLIN
FIGURE IV-6	PROPOSED WATER AND SEWER - CONCORD
FIGURE IV-7	PROPOSED WATER AND SEWER - EVERGREEN
FIGURE IV-8	PROPOSED WATER AND SEWER - OAKVILLE
FIGURE IV-9	PROPOSED WATER AND SEWER - SPOUT SPRING
FIGURE IV-10	PROPOSED WATER AND SEWER - VERA

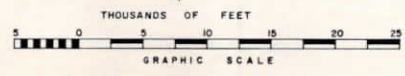
Note FIGURE IV-1, FIGURE IV-2 and FIGURE IV-3 are available as full scale drawings if needed for planning purposes

NOTE:
 MAINS ALONG HIGHWAYS SHOULD BE A MINIMUM OF 8 IN. DIAMETER TO PROVIDE MINIMUM FIRE FLOW TO OUTLYING COMMUNITIES FOR DOMESTIC SERVICE ONLY 6 IN. MAINS PROBABLY WILL BE ADEQUATE.

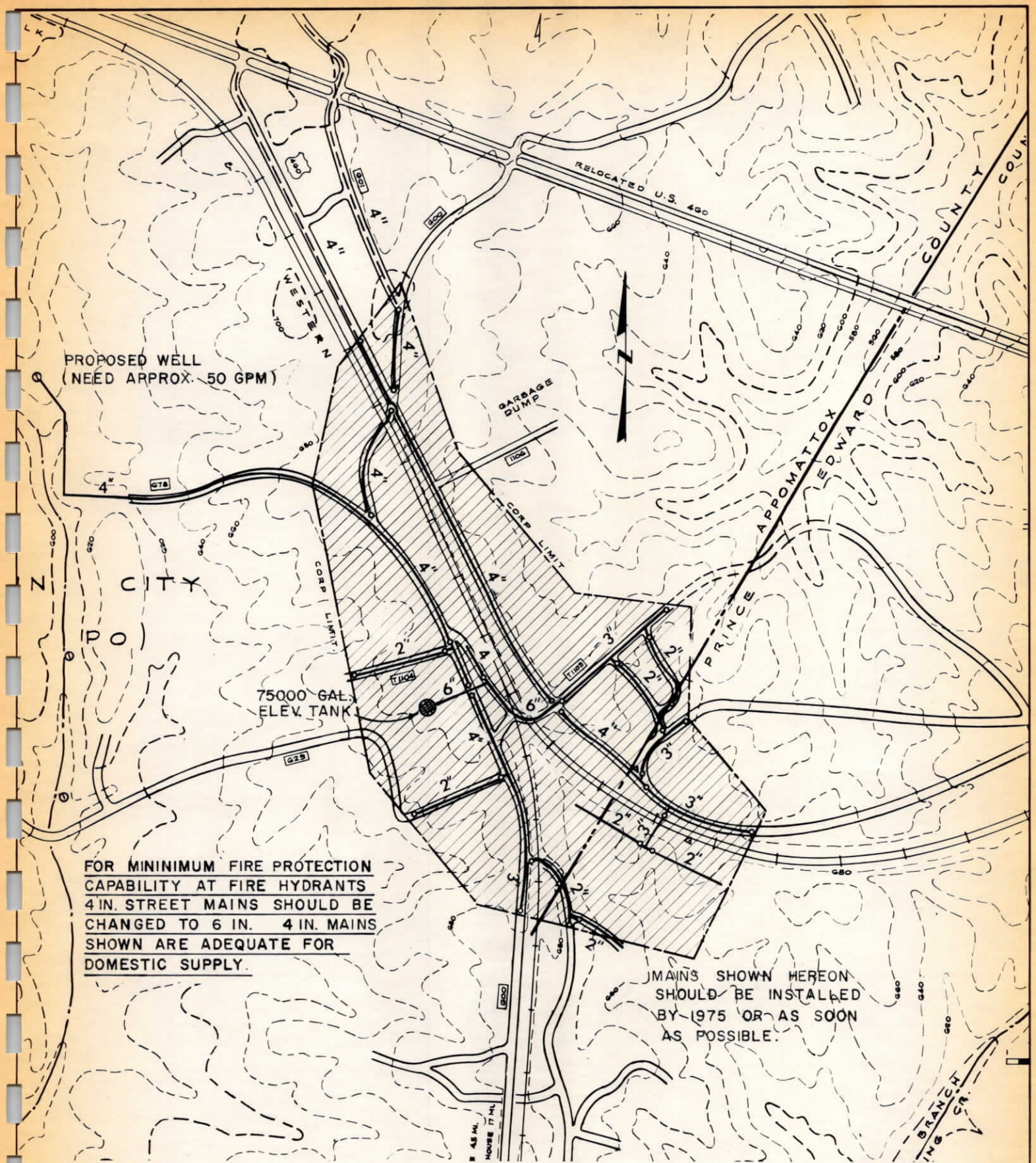
A COUNTY SEWAGE COLLECTION AND TREATMENT SYSTEM DOES NOT APPEAR TO BE FEASIBLE DUE TO THE LOW DENSITY POPULATION AND THE NUMBER OF LIFT STATIONS WHICH WOULD BE REQUIRED. SEWAGE COLLECTION AND TREATMENT FACILITIES SHOULD BE LIMITED TO THE MORE DENSELY POPULATED AREAS.



NOTE:
 TOTAL AREA OF COUNTY - 373 SQ. MILES
 AREA PROPOSED FOR WATER SERVICE - 18 SQ. MILES (BY 1990)
 COUNTY WIDE SEWERAGE COLLECTION AND TREATMENT ARE FEASIBLE WITHIN THE DESIGN PERIOD OF THIS REPORT.



MAP
 showing
AREAS CONSIDERED
 for
WATER and SEWER SERVICE
APPOMATTOX COUNTY, VA



NOTE:

INFORMATION SHOWN HEREON WAS
 TAKEN FROM "TOWN OF PAMPLIN CITY
 PRELIMINARY ENGINEERING REPORT"
 DATED NOVEMBER, 1968.

**PROPOSED WATER SYSTEM
 FOR
 PAMPLIN CITY**

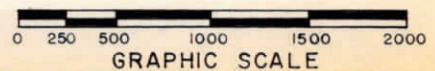
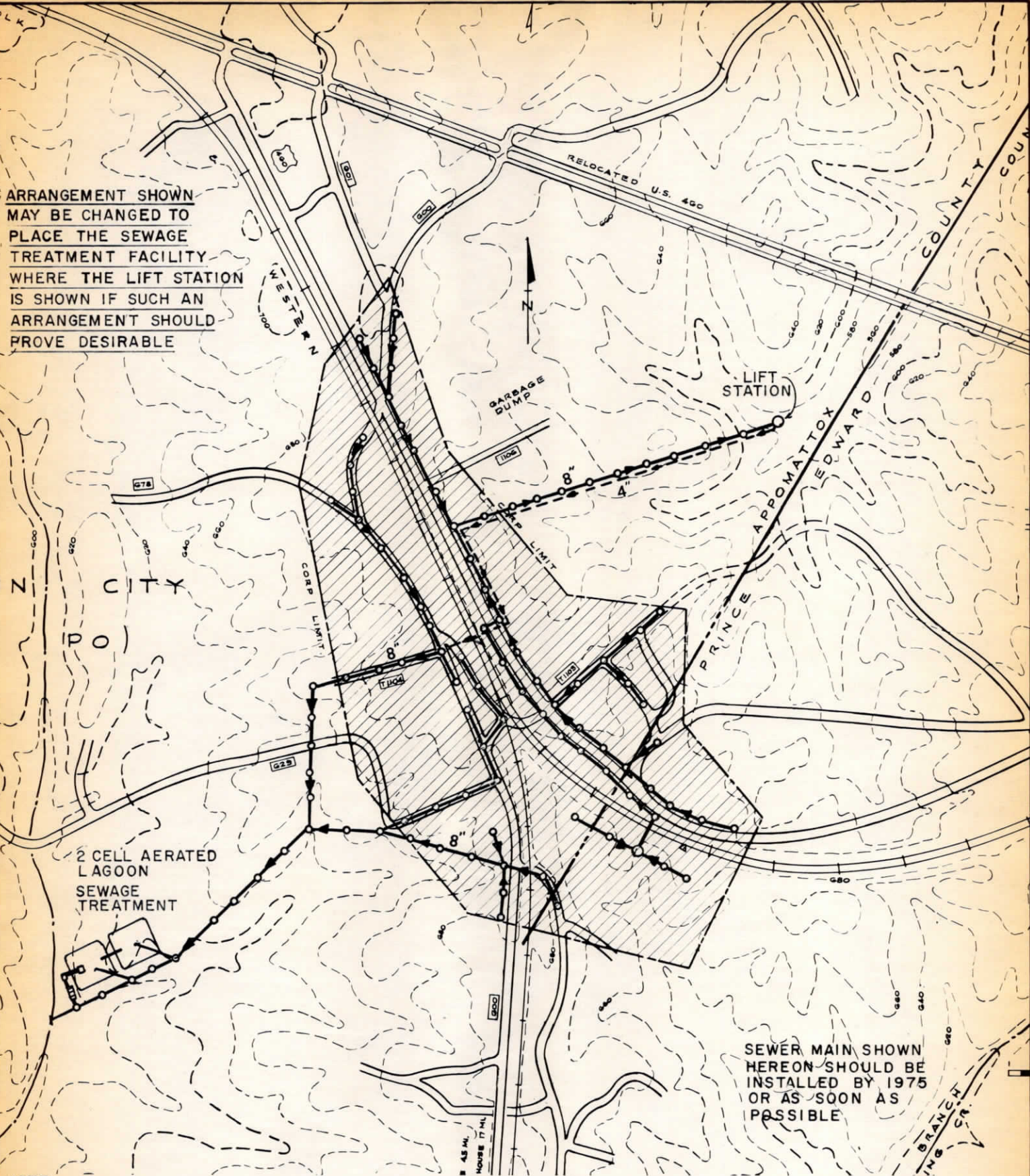


FIGURE IV-4

ARRANGEMENT SHOWN
MAY BE CHANGED TO
PLACE THE SEWAGE
TREATMENT FACILITY
WHERE THE LIFT STATION
IS SHOWN IF SUCH AN
ARRANGEMENT SHOULD
PROVE DESIRABLE



2 CELL AERATED
LAGOON
SEWAGE
TREATMENT

SEWER MAIN SHOWN
HEREON SHOULD BE
INSTALLED BY 1975
OR AS SOON AS
POSSIBLE

NOTE:
INFORMATION SHOWN HEREON WAS
TAKEN FROM "TOWN OF PAMPLIN CITY
PRELIMINARY ENGINEERING REPORT"
DATED NOVEMBER, 1968.

PROPOSED SEWER SYSTEM
FOR
PAMPLIN CITY

PREPARED BY
HANKINS & ANDERSON

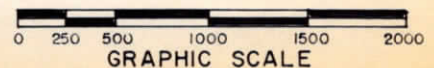


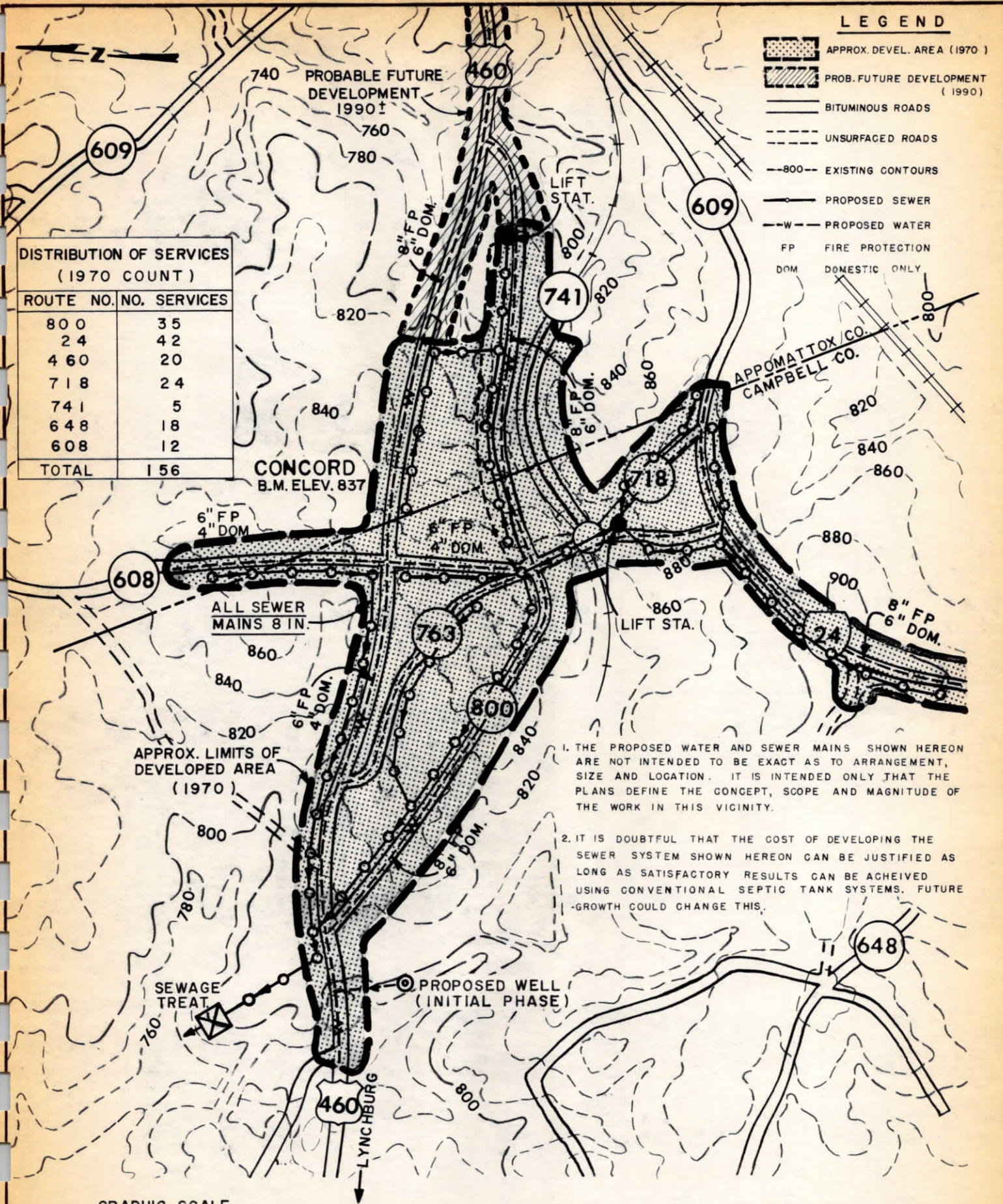
FIGURE IV.-5

LEGEND

-  APPROX. DEVEL. AREA (1970)
-  PROB. FUTURE DEVELOPMENT (1990)
-  BITUMINOUS ROADS
-  UNSURFACED ROADS
-  -800- EXISTING CONTOURS
-  PROPOSED SEWER
-  -W- PROPOSED WATER
- FP FIRE PROTECTION
- DOM DOMESTIC ONLY

**DISTRIBUTION OF SERVICES
(1970 COUNT)**

ROUTE NO.	NO. SERVICES
800	35
24	42
460	20
718	24
741	5
648	18
608	12
TOTAL	156



1. THE PROPOSED WATER AND SEWER MAINS SHOWN HEREON ARE NOT INTENDED TO BE EXACT AS TO ARRANGEMENT, SIZE AND LOCATION. IT IS INTENDED ONLY THAT THE PLANS DEFINE THE CONCEPT, SCOPE AND MAGNITUDE OF THE WORK IN THIS VICINITY.
2. IT IS DOUBTFUL THAT THE COST OF DEVELOPING THE SEWER SYSTEM SHOWN HEREON CAN BE JUSTIFIED AS LONG AS SATISFACTORY RESULTS CAN BE ACHIEVED USING CONVENTIONAL SEPTIC TANK SYSTEMS. FUTURE GROWTH COULD CHANGE THIS.

APPROX. LIMITS OF DEVELOPED AREA (1970)

ALL SEWER MAINS 8 IN.

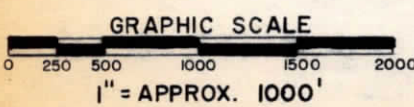
PROPOSED WELL (INITIAL PHASE)

SEWAGE TREAT.

LYNCHBURG

CONCORD
B.M. ELEV. 837

APPOMATTOX CO.
CAMPBELL CO.









PREPARED BY
HANKINS & ANDERSON

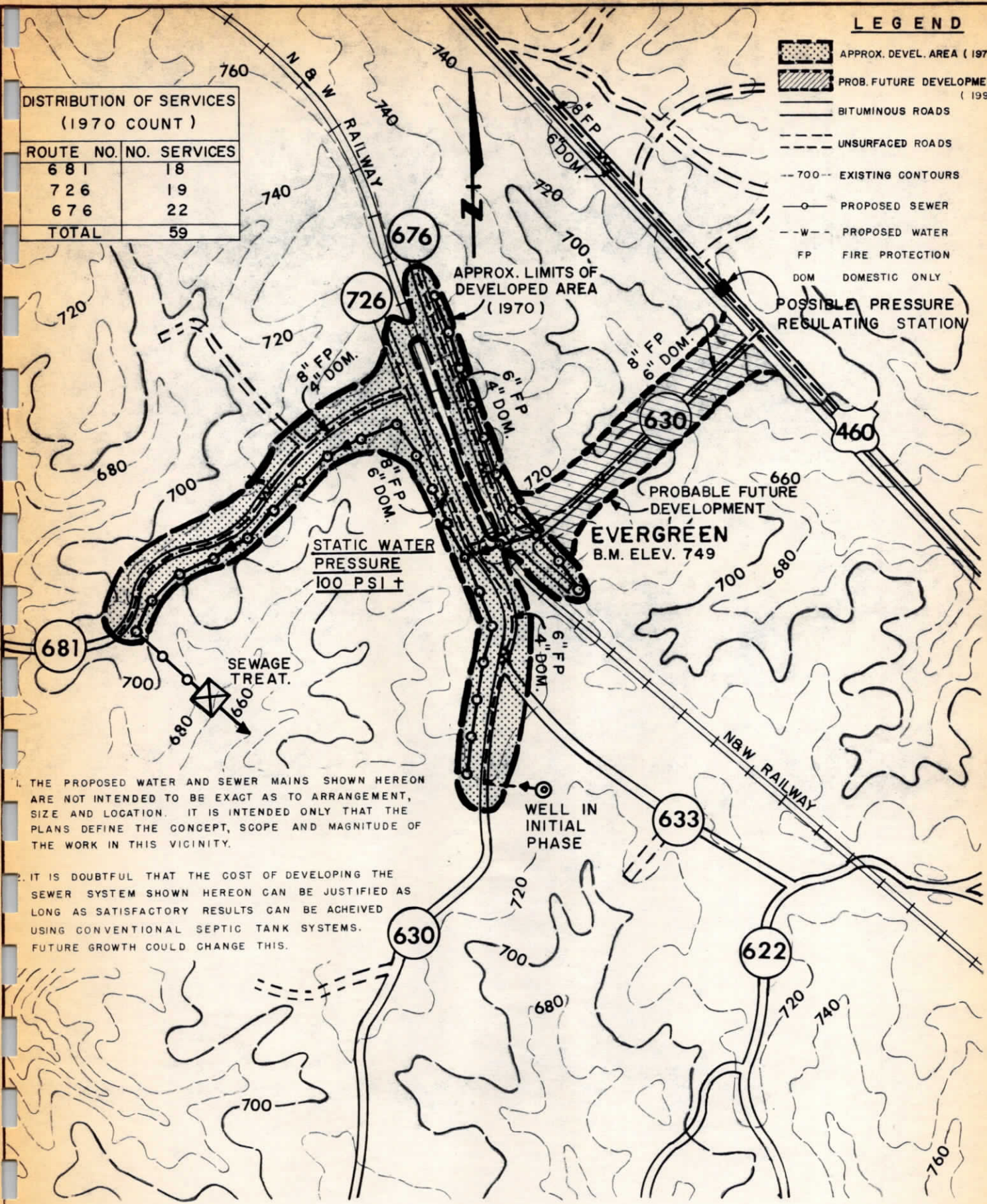
MAP SHOWING
A PROPOSED WATER & SEWER PLAN
IN VICINITY OF
CONCORD, VIRGINIA

**DISTRIBUTION OF SERVICES
(1970 COUNT)**

ROUTE NO.	NO. SERVICES
681	18
726	19
676	22
TOTAL	59

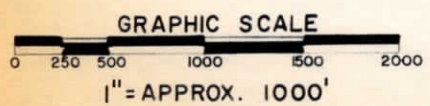
LEGEND

-  APPROX. DEVEL. AREA (1970)
-  PROB. FUTURE DEVELOPMENT (1990)
-  BITUMINOUS ROADS
-  UNSURFACED ROADS
-  -- 700 -- EXISTING CONTOURS
-  -- O -- PROPOSED SEWER
-  -- W -- PROPOSED WATER
-  FP FIRE PROTECTION
-  DOM DOMESTIC ONLY



1. THE PROPOSED WATER AND SEWER MAINS SHOWN HEREON ARE NOT INTENDED TO BE EXACT AS TO ARRANGEMENT, SIZE AND LOCATION. IT IS INTENDED ONLY THAT THE PLANS DEFINE THE CONCEPT, SCOPE AND MAGNITUDE OF THE WORK IN THIS VICINITY.

2. IT IS DOUBTFUL THAT THE COST OF DEVELOPING THE SEWER SYSTEM SHOWN HEREON CAN BE JUSTIFIED AS LONG AS SATISFACTORY RESULTS CAN BE ACHIEVED USING CONVENTIONAL SEPTIC TANK SYSTEMS. FUTURE GROWTH COULD CHANGE THIS.












PREPARED BY
HANKINS & ANDERSON

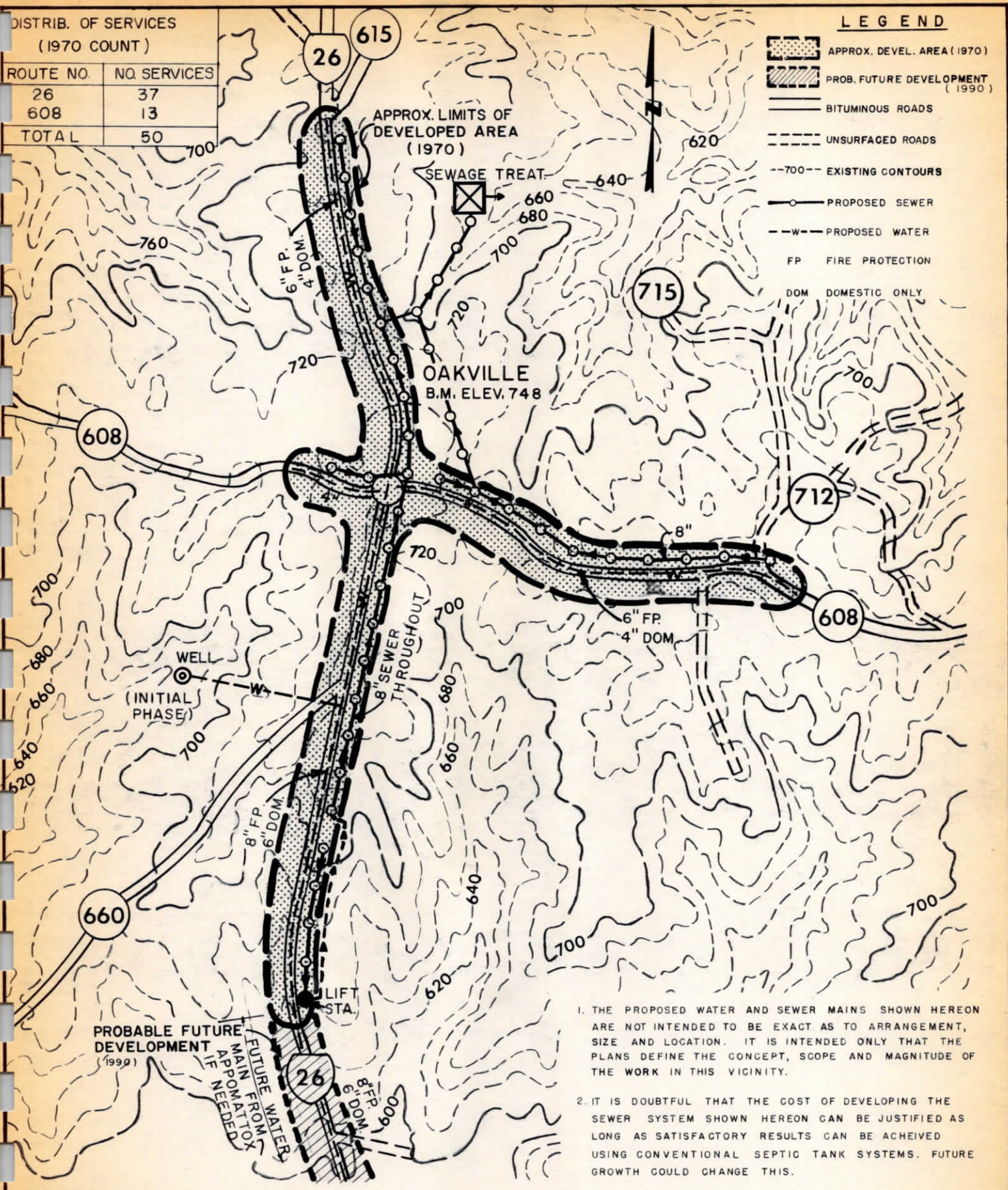
MAP SHOWING
A PROPOSED WATER & SEWER PLAN
IN VICINITY OF
EVERGREEN, VIRGINIA

DISTRIB. OF SERVICES
(1970 COUNT)

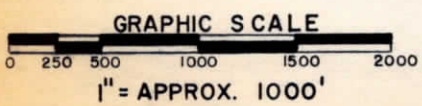
ROUTE NO.	NO. SERVICES
26	37
608	13
TOTAL	50

LEGEND

-  APPROX. DEVEL. AREA (1970)
-  PROB. FUTURE DEVELOPMENT (1990)
-  BITUMINOUS ROADS
-  UNSURFACED ROADS
-  -700- EXISTING CONTOURS
-  PROPOSED SEWER
-  -W- PROPOSED WATER
-  FP FIRE PROTECTION
-  DOM DOMESTIC ONLY




1. THE PROPOSED WATER AND SEWER MAINS SHOWN HEREON ARE NOT INTENDED TO BE EXACT AS TO ARRANGEMENT, SIZE AND LOCATION. IT IS INTENDED ONLY THAT THE PLANS DEFINE THE CONCEPT, SCOPE AND MAGNITUDE OF THE WORK IN THIS VICINITY.
2. IT IS DOUBTFUL THAT THE COST OF DEVELOPING THE SEWER SYSTEM SHOWN HEREON CAN BE JUSTIFIED AS LONG AS SATISFACTORY RESULTS CAN BE ACHIEVED USING CONVENTIONAL SEPTIC TANK SYSTEMS. FUTURE GROWTH COULD CHANGE THIS.



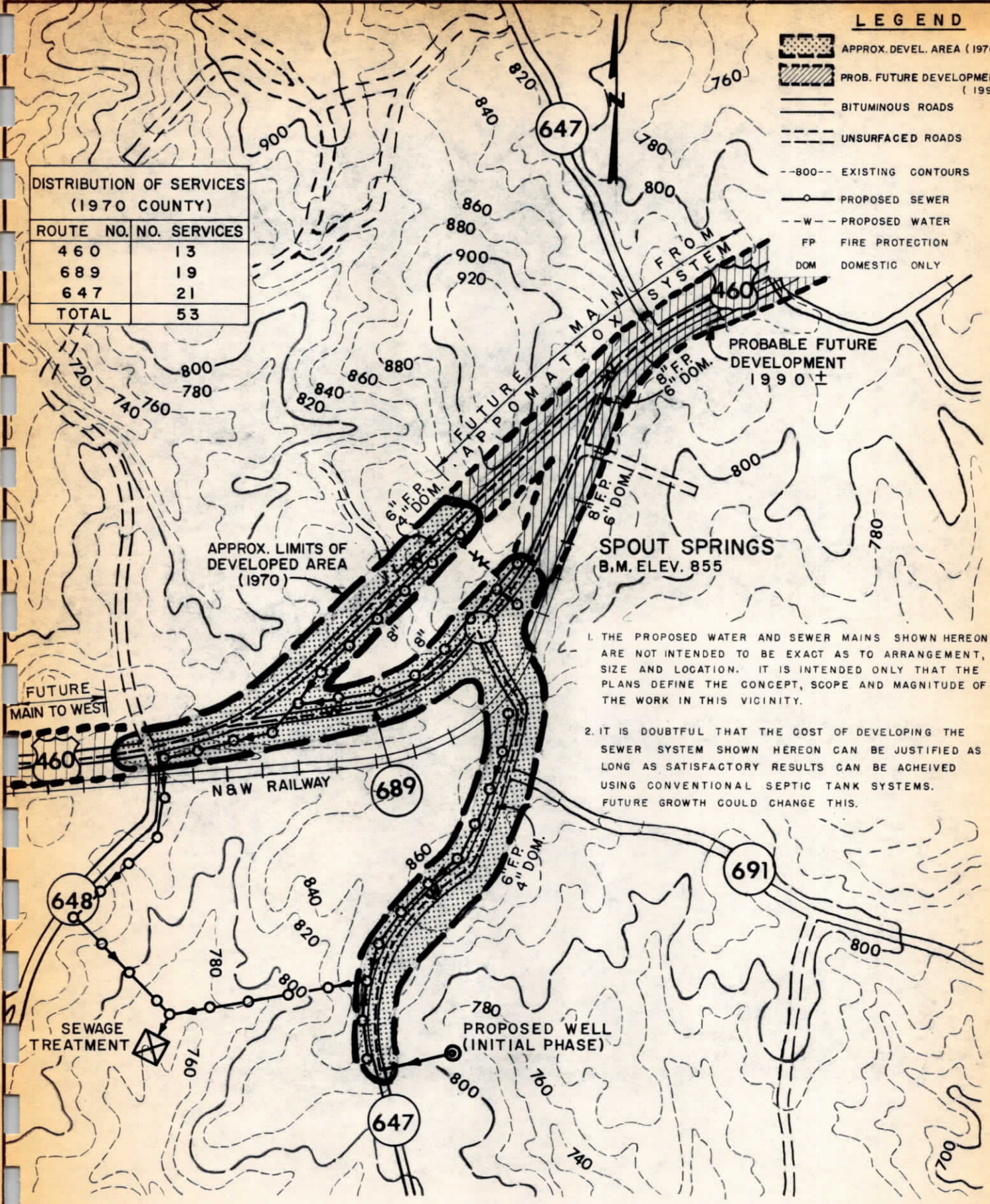
PREPARED BY
HANKINS & ANDERSON

MAP SHOWING
A PROPOSED WATER & SEWER PLAN
IN VICINITY OF
OAKVILLE , VIRGINIA

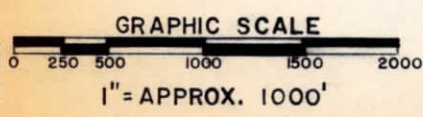
LEGEND

-  APPROX. DEVEL. AREA (1970)
-  PROB. FUTURE DEVELOPMENT (1990)
-  BITUMINOUS ROADS
-  UNSURFACED ROADS
-  --800-- EXISTING CONTOURS
-  PROPOSED SEWER
-  --W-- PROPOSED WATER
-  FP FIRE PROTECTION
-  DOM DOMESTIC ONLY

DISTRIBUTION OF SERVICES (1970 COUNTY)	
ROUTE NO.	NO. SERVICES
460	13
689	19
647	21
TOTAL	53

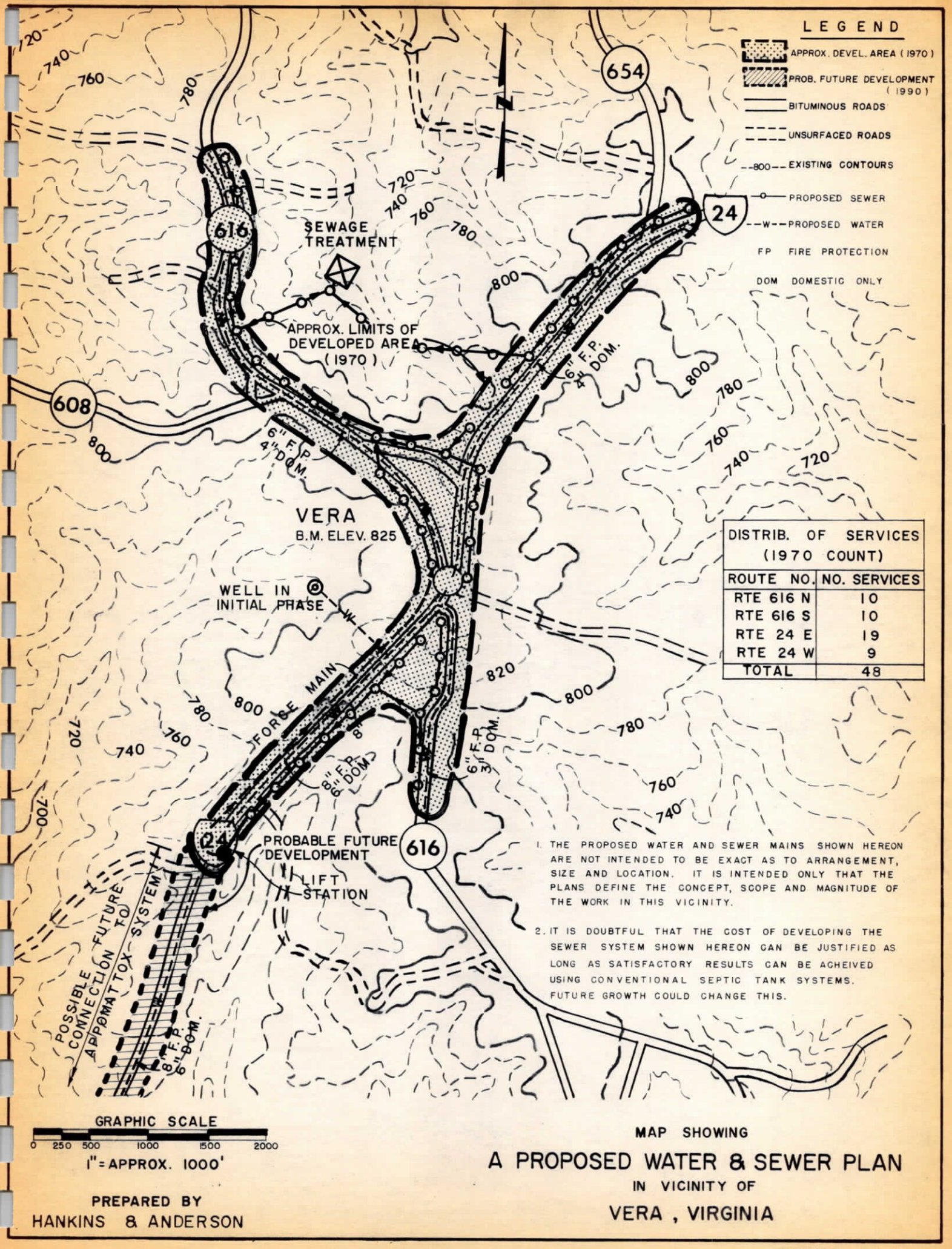


1. THE PROPOSED WATER AND SEWER MAINS SHOWN HEREON ARE NOT INTENDED TO BE EXACT AS TO ARRANGEMENT, SIZE AND LOCATION. IT IS INTENDED ONLY THAT THE PLANS DEFINE THE CONCEPT, SCOPE AND MAGNITUDE OF THE WORK IN THIS VICINITY.
2. IT IS DOUBTFUL THAT THE COST OF DEVELOPING THE SEWER SYSTEM SHOWN HEREON CAN BE JUSTIFIED AS LONG AS SATISFACTORY RESULTS CAN BE ACHIEVED USING CONVENTIONAL SEPTIC TANK SYSTEMS. FUTURE GROWTH COULD CHANGE THIS.



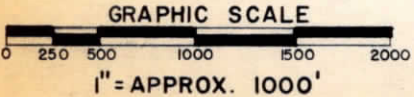
PREPARED BY
HANKINS & ANDERSON

MAP SHOWING
A PROPOSED WATER & SEWER PLAN
IN VICINITY OF
SPROUT SPRINGS, VIRGINIA



DISTRIB. OF SERVICES (1970 COUNT)	
ROUTE NO.	NO. SERVICES
RTE 616 N	10
RTE 616 S	10
RTE 24 E	19
RTE 24 W	9
TOTAL	48

1. THE PROPOSED WATER AND SEWER MAINS SHOWN HEREON ARE NOT INTENDED TO BE EXACT AS TO ARRANGEMENT, SIZE AND LOCATION. IT IS INTENDED ONLY THAT THE PLANS DEFINE THE CONCEPT, SCOPE AND MAGNITUDE OF THE WORK IN THIS VICINITY.
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PREPARED BY
HANKINS & ANDERSON

MAP SHOWING
A PROPOSED WATER & SEWER PLAN
IN VICINITY OF
VERA, VIRGINIA

PLAN FOR FINANCING

V. PLAN FOR FINANCING

1. Type of Organization

In order to implement the proposed work from a financial and a planning standpoint, it will be necessary to decide whether the Town of Appomattox or a sanitary authority will develop the water and sanitary systems. Since the nucleus of both water and sewer systems belongs to the Town, it seems only natural that the Town might continue to extend its services to persons outside of Appomattox. This is most certainly the best way to start development because: (1) the Town system needs improvements, (2) the Town has a ready made vehicle for financing, building and maintaining utility systems and, (3) the Town's thinking, from past experience, is oriented toward planning and utility problems. As time goes on and expenditures for out-of-town services increase, to the point where large bonded indebtedness is required, it is likely that the Town might prefer to become part of a County authority. However, before any decision is made, all parties concerned should become thoroughly familiar with the laws governing authorities.

2. Methods of Financing

- a. Water sub-mains and collector sewers should generally be constructed by building developers and the completed work turned over to the municipality or authority for maintenance. Where the municipality

or the authority must construct this work, the connection fee should generally be adequate to install that portion of the sewer or water chargeable to the property.

- b. Water and sewer rates should reflect realistically a debt service charge for construction of major capital improvements. Facilities such as wells, treatment plants, transmission mains and interceptor sewers are a part of the basic system and should generally be paid for by all customers through realistic water and sewer rates.
- c. There are many Federal and State programs which can provide financial assistance to municipalities and authorities who are trying to solve sewer and water problems. Most of these programs relate the "need" of the community to the degree of assistance offered.

3. Cost Figures

The following cost estimates are based upon current costs and a 20 Cities Average Engineering New Record Construction Cost Index of 1670. The estimates given are not intended to accurately reflect the cost of making the improvements but are intended to establish an order of magnitude of the work. The work in Pamplin City is not included in the figures, but the work in Concord, Spout Spring, Evergreen, Vera and Oakville is included in Phase II of the Water System.

a. Water System

	<u>Phase I</u> By 1975	<u>Phase II</u> By 1990
Proposed Mains	\$ 500,000	\$1,250,000
Wells	\$ 30,000	\$ 20,000
Stor. Tank (1.0 mg.)	\$ 110,000	\$ 110,000
Pump Station	\$ 85,000	- - - -
Miscellaneous	\$ <u>75,000</u>	\$ <u>120,000</u>
Total Construction Cost	\$ 800,000	\$1,500,000
*Total Cost (+30%)	\$1,040,000	\$1,950,000

*Total Cost includes allowance for land, engineer fees, legal fees, interest, refinancing and contingencies.

Annual Operating Budget - Phase I

Operation and Maintenance	\$ 20,000
Debt Service (1,040,000 x 0.059)	\$ 61,200
Reserves (10% O&M + D.S.)	\$ <u>8,000</u>
Total	\$ 90,000

Based Upon 1000 Services

$$\text{Monthly Charge} = \frac{90,000}{1000 \times 12} = \$7.50$$

Annual Operating Budget - Phase II

Operation and Maintenance	\$ 60,000
Debt Service (2,990,000 x 0.059)	\$ 176,000
Reserves (100% O&M + D.S.)	\$ <u>24,000</u>
Total	\$ 260,000

Based on 2600 Services

$$\text{Monthly Charge} = \frac{260,000}{2600 \times 12} = \$8.32$$

b. Sewage System

	<u>Phase I</u> By 1975	<u>Phase II</u> By 1990
Pipe	\$ 250,000	\$ 530,000
Manholes	\$ 75,000	\$ 150,000
Lift Stations	\$ 75,000	- - - -
Treatment Plant	\$ <u>375,000</u>	<u>- - - -</u>
Total Construction Cost	\$ 775,000	\$ 680,000
*Total Cost (+30%)	\$1,000,000	\$ 880,000

*Total Cost includes allowance for land, engineer fees, legal fees, interest, refinancing and contingencies.

Annual Operating Budget - Phase I

Operation and Maintenance	\$ 20,000
Debt Service (1,000,000 x 0.059)	\$ 59,000
Reserves (10% O&M + D.S.)	\$ <u>8,000</u>
Total	\$ 87,000

Based Upon 900 Services

$$\text{Monthly Charge} = \frac{87,000}{900 \times 12} = \$8.08$$

Annual Operating Budget - Phase II

Operating and Maintenance	\$ 36,000
Debt Service (1,880,000 x 0.59)	\$ 117,000
Reserves (10% O&M + D.S.)	\$ <u>16,000</u>
Total	\$ 169,000

Based on 1660 Services

$$\text{Monthly Charge} = \frac{169,000}{1660 \times 12} = \$8.50$$

PLAN FOR EXECUTION OF IMPROVEMENTS

VI. PLAN FOR EXECUTION OF IMPROVEMENTS

The question as to which type of governmental unit will handle planning and financing for the utility improvements should be answered before too much thought is given to priorities in construction. If the Towns of Appomattox and Pamplin do the work they must of necessity consider the welfare of their citizens first. If an authority is formed to do the work a more unbiased view can be taken of the needs of all of the customers.

From the viewpoint of design, a logical sequence of priorities is as follows:

1. Water System (See Figures IV-1, IV-2 and IV-4)
 - a. Install the proposed Pamplin City water system as shown on Figure IV-4.
 - b. Strengthen the town of Appomattox interior distribution system in accord with Figure IV-2. Try to complete at least one 8 in. pipe loop around and through the Town.
 - c. Construct additional storage facilities. (At least 1.0 million gallons.)
 - d. Develop at least one new well as a source of supply. (Prospect

for additional well sites outside of the corporate limits.)

- e. Extend mains and sub-mains into areas adjoining Appomattox.
- f. Begin pre-engineering and land acquisition for surface water supply. Coordinate with Soil Conservation Service.
- g. Begin extension of mains along highways to serve Concord, Spout Spring, Evergreen, Pamplin, Vera and Oakville.
- h. Complete circumferential loop around newly developed area north-east of Appomattox. Tie ends of sub-mains and mains into this loop to form grid in the new area.

2. Sewage System (See Figures IV-3 and IV-5)

- a. Construct first phase of new treatment facility at Appomattox.
- b. Divert gravity flow from Appomattox Town to new treatment plant.
- c. Abandon existing southside trickling filter plant at Appomattox.
- d. Divert as much flow from existing Appomattox lagoon as possible by gravity.

e. Construct Pamplin City sewage treatment and collection system.
(See Figure IV-5)

f. Construct Appomattox northside pump stations and force mains.

g. Begin construction of Appomattox northside gravity interceptors.

h. Begin construction of Appomattox southside gravity interceptors.

i. Continue construction of Appomattox interceptors.

SYSTEM FOR UPDATING PLAN

VII. SYSTEM FOR UPDATING PLAN

It seems that the most reasonable time to update this plan would be immediately after the 1980 census is completed. New population data and projections will be readily available at that time. Enough time will have elapsed for: (1) Some of the work to be done and, (2) Population trends and patterns to become more definite.

At that time the report should be not only updated but should be extended ahead for an additional period of 10 to 20 years. Items of information which should be gathered and evaluated include particularly the following:

1. Amount of work done in accord with the previous plan.
2. Amount of work done not in accord with plan.
3. Population and distribution of population. (Compare with projections of this report.)
4. The economic situation.
5. The public desire for water and sewer service.
6. Head count of potential water and sewer users in various communities.
7. Changing patterns in type of population.

EVIDENCE OF CONCURRENCE

VIII. EVIDENCE OF CONCURRENCE

On May 24, 1971, Hankins and Anderson met with the Appomattox Town Council to review the preliminary findings of this report. Also present were representative of the Virginia State Health Department, the State Water Control Board, the Pamplin Town Council, Appomattox County Planning Commission and Central Virginia Planning Commission. A representative of the Farmers Home Administration was unable to attend. On the basis of the discussion at the meeting and the preliminary findings of this report, Hankins and Anderson was authorized to proceed with a more detailed study of treatment plant location and design.

The work of this report was coordinated with the firm of Wiley and Wilson, Lynchburg Consulting Engineers, who prepared the "Central Virginia Planning District Commission Water and Sewer Report". It is understood that the report has not, at this time, been finally accepted by the Central Virginia Planning Commission.

Also offered as evidence of concurrence are three Exhibits which are copies of letters or reports furnished by governmental agencies. The Exhibits are:

EXHIBIT I Copy of letter from the Commonwealth of Virginia, Division of Water Resources, relative to ground water.

EXHIBIT II Copy of letter from the Commonwealth of Virginia, Department of Health, Comments on Pamplin City Engineering Report.

EXHIBIT III U. S. Department of Agriculture, Soil Conservation Service, A General Description of Soils in Appomattox County.

EXHIBIT IV U. S. Department of Agriculture, Soil Conservation Service, General Soils Map, Appomattox County.

EXHIBIT V Copy of letter of approval from Appomattox County Planning Commission.

in the first 150 feet of bedrock. Approximately 95% of the wells in Appomattox County have been constructed for farm and domestic uses, are less than 160 feet deep, are 6" in diameter, and have an average yield rate of 12 gallons per minute.

The most productive wells in the county are located in and owned by the town of Appomattox. These wells obtain water from several openings and permeable zones in a schistose-gneiss rock that is the predominant bedrock beneath the eastern two thirds of the county. Other large supplies of water probably are available from these rocks from wells 6" to 8" in diameter which are located at sites where recharge is available to permeable or fractured zones or to formation contact zones. There are no known attempts to obtain large supplies of water in the limestone-marble area on the southeast side of the James River, but solution channels and fractures in these rocks could conceivably yield more than 100 gallons per minute to wells that penetrate them.

Dissolved solids are usually low except in water obtained from the lower 10 feet of the weathered zone and upper 10 feet of bedrock. Iron and acid conditions are common in most parts of the county and the water is generally soft to moderately hard. In areas where the water is quite acidic, such as in Appomattox, the apparent high iron content may be due to corrosion of metal in the pipe system. Wells in the limestone and marble areas near the James River produce water that is hard as a result of the high calcium and magnesium content.

In the town of Appomattox, the most prolific water producing area in the county, one well drilled in 1966 to a depth of 300 feet produced a yield rate of 150 gpm. Two other wells drilled to slightly over 105 feet each have a yield-rate capacity of over 100 gpm. One of these wells flowed at an approximate 50 gpm-rate for years until a pump was installed; the static water level in the other well is only 3 feet below ground surface. Another town-well drilled in 1961 is 111 feet deep and produces from 50-60 gpm with about 26 feet of drawdown.

The town of Appomattox generally overlies the contact between the schistose lithologies of the metamorphosed sedimentary rocks and a tabular sill of hornblende gneiss which has been intruded into the older metamorphic host rock. Commonly, zones of contact between the intrusives and surrounding country rock may favor the accumulation of ground water. Undoubtedly, these contact zones exist elsewhere, but more exploration work should be performed to accurately delineate them. Fortunately, in Appomattox's case, one contact area between the metamorphic and the intrusive is apparently in close juxtaposition to the town. Further exploration in the Appomattox vicinity should generally be restricted to areas toward the east, southeast, south, and north-east of the town or where good evidence exists of contact zones. There is a very definite likelihood that further drilling in the Appomattox area will produce additional wells which have an unusually high yield rate as compared to the rather poor water yielding history of the remainder of the county.

April 15, 1970

In the Spout Spring area a survey of water wells revealed that total depth ranged from 64 to 132 feet. The average total depth of these wells is approximately 90 feet. Yields range from 2½ gpm to 20 gpm, with an average yield rate of 9 gpm. The Spout Spring area completely overlies the schistose rocks of the metamorphic complex, hence, the low yields which is normal for this type lithology. Strata of the Evington Group was apparently penetrated in one well drilled in 1956, but the yield from this formation was less than 10 gpm. Past history seems to indicate that in the Spout Spring area yield rates over 20 gpm would more than likely be unobtainable.

Water well data concerning the Concord area is very sparse. However, the few data in our files indicate that the total depth of wells range from 65 feet to 175 feet, with a 119-foot average. The yield rates of these wells range from 3 to 30 gpm, with an average yield of 12 gpm.

The Concord area overlies rocks of the Ordovician Evington Group which/composed chiefly of phyllites and schists interbedded with greenstone and marble. These rocks are very poor water producers. This fact is amply emphasized by the poor water producing history of the area. A northeast-trending hornblende-gneiss intrusive complex which extends for several miles lies a short distance to the east of Concord. This is apparently a contact zone between rocks of the Ordovician Evington Group, the hornblende-gneiss intrusive, and the Precambrian? metamorphosed rocks (schists) further to the east. Perhaps further exploration in this area may prove fruitful as contact zones nearly always offer the best potential.

The town of Vera is apparently superimposed over the contact zone of the northeast-trending intrusive body of hornblende-gneiss, part of the same complex that occurs in Appomattox and the old metamorphic lithologies that generally predominate in the county. This indicates that ground water potential in this area should closely parallel the potential of the Appomattox area. However, there are absolutely no data in our files to either confirm this suspicion or to deny it. Only a test-drilling program in the Vera area can accurately ascertain its true ground water potential.

The Evergreen area overlies the same metamorphic complex that prevails over most of the county. Existing water well data in our files indicate that the total depth of wells in this area range from 65 to 105 feet, and have yield rates from 3½ to 15 gpm. Slightly east of Evergreen, a large body of the Shelton granite gneiss trends in a northeasterly direction terminating near Andersonville in Buckingham County. Perhaps exploration along the contact zone between these two bodies might prove fruitful.

The ground water potential in areas directly to the north and directly to the southwest of Evergreen would appear to be very low, unless a cross-cutting dike is encountered which would enhance the water yielding potential as secondary fracture porosity would presumably be present to insure a better yield rate.

This Division hopes that the information contained in this report will be helpful to you in your study. If you wish to obtain more information about

Mr. Elliott

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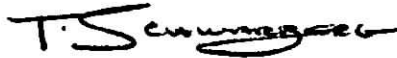
April 15, 1970

the county or any other county for that matter although there is a real paucity of such things as data in our files for the time being, we are hopeful that this condition will change as more and more people become aware of the importance of our ground water resource.

I am sorry that the preparation of this report, brief though it was took somewhat longer than was initially planned. I hope the delay didn't inconvenience you too much.

If we can be of further help please do not hesitate to contact us.

Sincerely yours,



Thomas M. Schwarberg
Geologist

TMS:lrc

COMMONWEALTH OF VIRGINIA



MACK I. SHANMOLTZ, M. D.
COMMISSIONER

DEPARTMENT OF HEALTH
RICHMOND, VA. 23219

SUBJECT: TOWN OF PAMPLIN CITY
Preliminary Engineering Report on
Water Supply System and Sewerage

6 May 1969

Mr. Creed T. Elliott
Hankins and Anderson
2117 North Hamilton Street
Richmond, Virginia 23230

Dear Mr. Elliott:

This is in reference to the Preliminary Engineering Report ~~FILE~~ the Town of Pamplin City which was previously submitted for our review and your letter of 17 April 1969 which included a copy of the FHA Instruction 424.2 -- Exhibit A.

We have reviewed this Preliminary Engineering Report and this is to advise that we are in complete agreement that central water and sewerage systems are needed for Pamplin City.

It is our understanding that only one well is proposed at this time for the water supply. We feel that at least two wells would be desirable for the proposed 175 connections, however, this may not be a serious problem with the proposed volume of storage if rapid maintenance of the well pump, etc., is available. We understand that it was necessary to reduce the size of the initially proposed water mains to receive any consideration for a grant from the Farmers Home Administration. It is also noted that the lengths of 2-inch and 3-inch water lines are greater than the minimum length recommended under Federal Housing Administration standards. We feel that the installation of small lines is undesirable in a long-range program, however, we will offer no further comments on this matter as long as an adequate quantity of domestic water with a minimum of 20 psi can be delivered to all of the customers at all times.

It will be necessary for one of our engineers to approve the proposed well sites before drilling is started, so please notify us so a joint inspection can be made with you.

RECEIVED			
HANKINS AND ANDERSON			
FOR _____			
COMM. _____			
MAY 8 1969			
FROM	TO	DATE	FOR

EXHIBIT II
Page 1

Mr. Creed T. Elliott
6 May 1969
Page 2

We recommend that a preliminary proposal be officially submitted on the proposed sewerage system for our review and forwarding to the State Water Control Board for their action before final plans are prepared. The two cell sewage lagoon with the first cell designed for 300 persons per acre and second cell proposed as a polishing pond which is followed by chlorination and supplemental aeration appears to be in line with the treatment suggested by the letter of 26 July 1968 from the State Water Control Board Staff. No one from this office has visited the proposed lagoon site and receiving stream so we cannot comment further on this proposal at this time.

If we can be of further assistance in development of public water and sewerage systems for Pamplin City, please let us know.

Very truly yours,


Norman Phillips, Jr, Director
Bureau of Sanitary Engineering

CC: Appomattox Co. Health Department

A GENERAL DESCRIPTION OF THE SOILS IN APPOMATTOX COUNTY

Appomattox County lies entirely within the Piedmont physiographic province. Most of the county has surface soils of loam or silt loam with a red clay subsoil. An area along the Prince Edward and Charlotte County boundaries and one in the southwestern part of the county have a fine sandy loam surface soil with red to yellowish red clay subsoils. Most of the soils are well drained and range from about 2 to 5 feet over either hard rock or soft rock of schist, granite gneiss, greenstone or hornblende. Generally the county is more dissected in the western part, the more favorable relief being in the eastern part. In general, this indicated better use for grass land farming in the western part and an improving situation for row crops toward the eastern part. The best bright tobacco land is the extreme south and southeastern part of the county. Soils over a wide area of the county are well suited to dark tobacco.

Many soils along the streams and drainageways are fairly steep and are shallow. Narrow flood plains along many of the streams are among the more fertile soils in the county, but in many places drainage is needed in order to bring the soil into good agricultural production. Iredell and Mecklenburg soils in and near Appomattox and along Sugnee Creek in the eastern part of the county have plastic clay subsoils and have restricted drainage. These areas have gentle slopes but can best be used for grassland. Soils in these areas and in low wet areas are some of the best for pond sites. Areas of Lloyd and Wilkes soils are among the least desirable for pond sites in the county.

SOIL LIMITATIONS FOR BUILDINGS AND SEPTIC SYSTEMS IN THE SOIL
ASSOCIATIONS OF APPOMATTOX COUNTY

This is intended to show soil limitations for buildings and septic systems in a very general nature and specific areas may need further study before final decisions are made. Reference is made so slight, moderate and severe limitations of the soils in this county. Slight limitations indicates there is little or no risk involved. Moderate limitations denotes that either further investigation is necessary to determine risk involved or that some modifications of moderate complexity and cost will or may be necessary to carry out a plan. Severe limitations indicates that very complex and costly operations will be necessary to carry out a plan.

The ratings in the table are only guides. For specific sites detailed soil surveys and investigations are necessary. There are other soils of minor extent that are not rated because of wide variations in characteristics.

APPOMATTOX COUNTY

<u>SOIL</u>	<u>LIMITATIONS FOR STRUCTURES (1)</u>	<u>FOR SEPTIC SYSTEMS</u>
Cecil	slight	moderate (2)
Appling	slight	moderate (2)
Tatum	slight	moderate (2)
Manteo	severe	severe
Nason	slight	moderate (2)
Georgeville	slight	moderate (2)
Lloyd	slight	moderate (2)
Wilkes	severe	severe
Iredell	severe	severe
Mecklenburg	severe	severe
Helena	severe	severe
Vance	slight to moderate	severe

(1) Ratings are for slopes of 2 to 7 percent for all soils except Manteo and Wilkes which are for slopes of 15 to 25%.

(2) Specific borings need to be taken to determine whether hard rock or tight material underlies the subsoil, an undesirable condition, or whether loose or friable coarse material underlies the subsoil, a favorable condition. Both conditions may be found under these soils.

GENERAL SOILS MAP
APPOMATTOX COUNTY, VIRGINIA

SOIL ASSOCIATIONS

Areas dominated by soils developed from granites, gneisses and schists with light colored fine sandy loam surface soils.

1. Cecil-Applying Association. Minor inclusions of Lloyd, Madison and Wilkes. Deep well drained soils with moderately permeable red to yellowish red clay subsoil. Gently sloping to moderately steep.

Areas dominated by soils developed from serécite schist with light colored loam surface soils.

2. Tatum,-Manteo-Nason Association. Minor inclusions of Georgeville, Herndon and Lloyd. Tatum and Nason are deep to moderately deep soils with moderately permeable red to yellowish red clay subsoils. Hard rock usually between 30 and 40 inches from the surface. Manteo is shallow and excessively drained with little or no subsoil. Gently sloping to moderately steep.
3. Georgeville-Tatum-Nason-Manteo Association. Minor inclusions of Herndon and Lloyd. Georgeville, Tatum and Nason are deep well drained soils with moderately permeable red to yellowish red clay subsoils. Hard rock is usually over 50 inches and Tatum and Nason from 30 to 40 inches below the surface. Manteo is shallow and excessively drained with little or no subsoil. Gently sloping to moderately steep.
4. Lloyd-Wilkes Association. Minor inclusions of Georgeville, Herndon and Cecil. Lloyd soils are deep, well drained, have dark brown loam surface layers and moderately permeable reddish brown subsoils. Wilkes is shallow and excessively drained with very little subsoil. Gently sloping to moderately steep.
5. Iredell-Mecklenburg-Lloyd Association. Minor inclusions of Enon, Wilkes, and Lloyd. Iredell and Mecklenburg are moderately deep soils with slowly permeable plastic to very plastic clay subsoils mostly on gentle slopes. Lloyd soils are deep, well drained with moderately permeable reddish brown clay subsoils on gently sloping to moderately steep slopes.
6. Wilkes-Helena-Vance Association. Minor inclusions of Lloyd, Iredell and Enon. Wilkes is shallow and excessively drained with very little subsoil on gently sloping to moderately steep slopes.

7. Lloyd-Mecklenburg-Wilkes Association. Minor inclusions of Georgeville, Herndon and Enon. Lloyd soils are deep, well drained with dark brown loam surface layers and moderately permeable reddish brown clay subsoils on gently sloping to moderately steep slopes. Mecklenburg soils are moderately deep to deep with loam surface layers and slowly permeable yellowish-red plastic clay subsoils mostly on gentle slopes. Wilkes soils are shallow and excessively drained with very little subsoil and are on gently sloping to moderately steep slopes.

BIBLIOGRAPHY

IX. BIBLIOGRAPHY

FHA Instruction 442.7

EXHIBIT A - GUIDES FOR USE IN THE PREPARATION OF COMPREHENSIVE AREA PLANS FOR WATER AND SEWER SYSTEMS

**Commonwealth of Virginia, Governor's Office, Division of Planning
DATA SUMMARY, APPOMATTOX COUNTY**

**Commonwealth of Virginia, Governor's Office, Division of Planning
PROJECTIONS AND ECONOMIC BASE ANALYSIS, APPOMATTOX COUNTY**

**Commonwealth of Virginia, Governor's Office, Division of Planning
COMPREHENSIVE PLAN, APPOMATTOX TOWN, APPOMATTOX COUNTY AND PAMPLIN CITY**

THE 1970 CENSUS OF POPULATION AND HOUSING FOR APPOMATTOX, VIRGINIA

**Commonwealth of Virginia, Governor's Office, Division of Planning
STATISTICAL INFORMATION SERIES NO. 71-1**

**U.S. Department of Commerce
1970 CENSUS OF POPULATION**

**Commonwealth of Virginia, Governor's Office, Division of Planning
ZONING ORDINANCE, TOWN OF APPOMATTOX, VIRGINIA, APRIL 23, 1969**

**Hankins and Anderson
TOWN OF APPOMATTOX, ENGINEERING REPORT**

**Hankins, Anderson and Moncrief
TOWN OF PAMPLIN CITY, PRELIMINARY ENGINEERING REPORT**

**University of Virginia, Bulletin 38
KYANITE IN VIRGINIA**

**National Board of Fire Underwriters, New York, Chicago, San Francisco, 1956
STANDARD SCHEDULE FOR GRADING CITIES AND TOWNS OF THE UNITED STATES WITH
REFERENCE TO THEIR FIRE DEFENSES AND PHYSICAL CONDITIONS**

**U.S. Department of Interior
1970 WATER RESOURCES DATA FOR VIRGINIA**