COMPREHENSIVE DEVELOPMENT PLAN

ROANOKE COUNTY, VA. 1984

VOL. I : INVENTORY & ANALYSIS

VOL. II : PUBLIC PARTICIPATION

VOL. III : LANDUSE AND TRANSPORTATION

VOL. IV : PUBLIC FACILITIES

VOL. V : FINANCIAL MANAGEMENT

Roanoke County Comprehensive Development Plan

Volume One: Inventory and Analysis of Existing Conditions

Preliminary Draft

March 13, 1984

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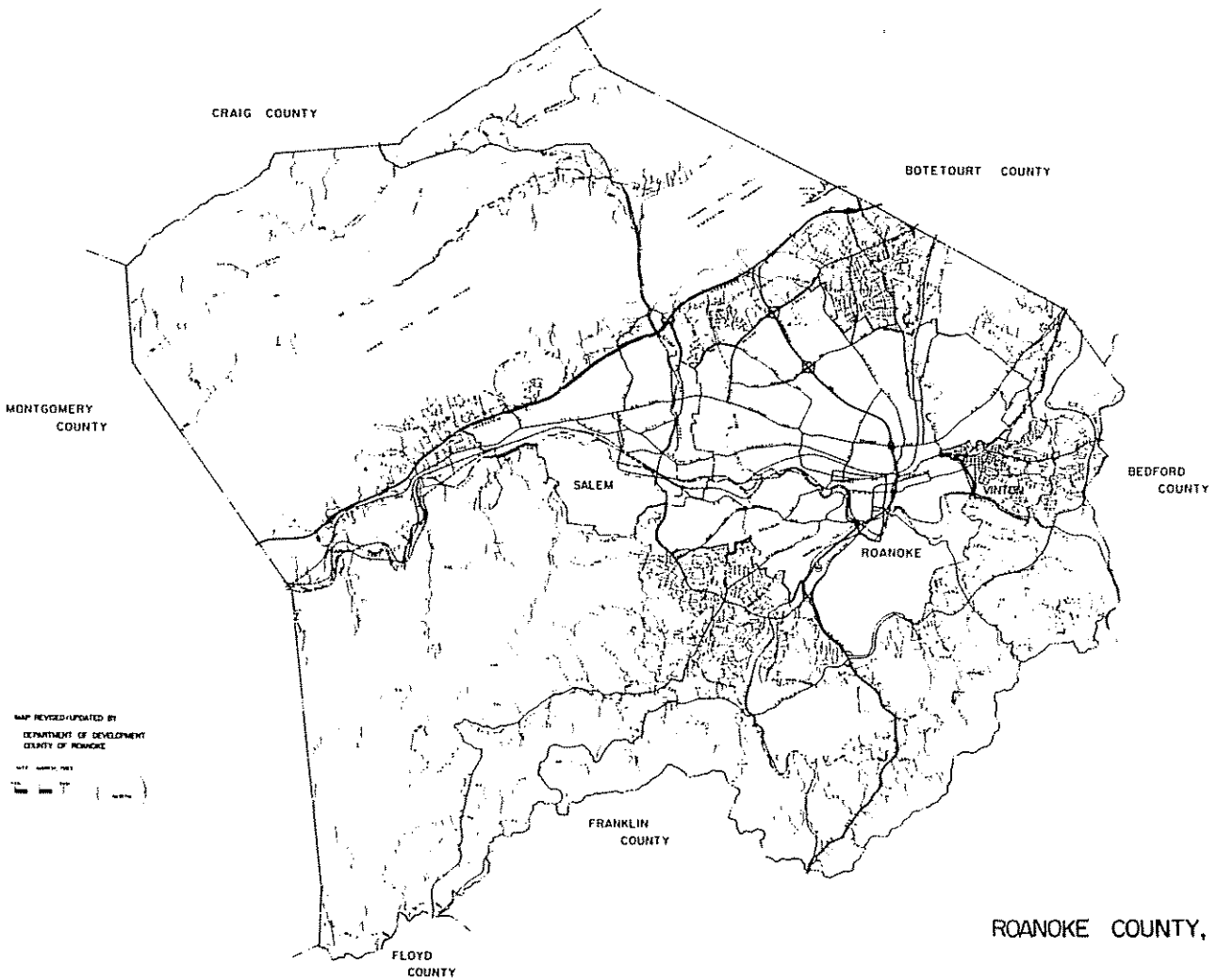

ROANOKE COUNTY, VA.

CHAPTER I

INTRODUCTION

INTRODUCTION

The Roanoke County Comprehensive Development Plan functions primarily as a management tool.

The policies, programs, and plans contained within the Comprehensive Development Plan are intended to guide shorter-range operational decisions within the context of longer-range priorities.

The Plan allows the County's elected, appointed, and administrative decision-makers to consider and agree upon defined courses of action that may be used to manage the physical development of the community. In addition, the Plan communicates development priorities to private sector interests that are impacted by public sector capital investment decisions and land use regulations.

The Comprehensive Development Plan provides the analytical core of current information required for successful planning and decision-making. The Plan is the cornerstone of a continuous mechanism, an information system, that functions to maintain and make accessible readily understood information required for effective management.

Contents of the Comprehensive Development Plan Document

The Roanoke County Comprehensive Development Plan document consists of five primary components:

Volume 1: Inventory and Analysis of Existing Conditions
Volume 2: Public Participation
Volume 3: Land Use and Transportation
Volume 4: Public Facilities
Volume 5: Financial Management

Volume 1: Inventory and Analysis of Existing Conditions evaluates population trends and projected growth, economic vitality, land use and housing quality, environmental constraints, transportation networks, community facilities, and utility services that characterize the County and each of the County's twelve community planning areas (see Figure 1-A). The community planning areas, defined below, are the primary building blocks upon which the Inventory and Analysis and the Comprehensive Development Plan are founded.

Community Planning Areas

Planning Area	Square Miles	1983 Population	Population Density
Back Creek	19.09	1,936	101.41
Bent Mountain	24.24	862	35.56
Bonsack	7.12	1,903	267.28
Catawba	36.95	1,084	29.34
Cave Spring	12.69	15,667	1,234.59
Clearbrook	5.79	1,650	284.97
Glenvar	44.42	7,187	161.80
Mason's Cove	41.93	2,096	49.99
Mount Pleasant	16.75	4,000	238.81
Peters Creek	17.23	17,237	1000.41
Vinton	3.87	3,300	852.71
Windsor Hills	8.19	11,272	1,376.31
Total Planning Areas	248.28	68,194	274.67
Town of Vinton	3.20	8,086	2,526.88
County Total	251.48	76,280	303.32

1. As of June 1, 1983

Source: Roanoke County, Department of Development

Detailed wall maps describing **Community Planning Areas, Existing Land Use, Agricultural Analysis, Housing Characteristics, Existing Zoning, Slope and Drainage, General Soils and Septic Suitability, Community Facilities, Traffic Volume, Hazardous Bridges and Railroad Crossings, Existing Water Systems,**

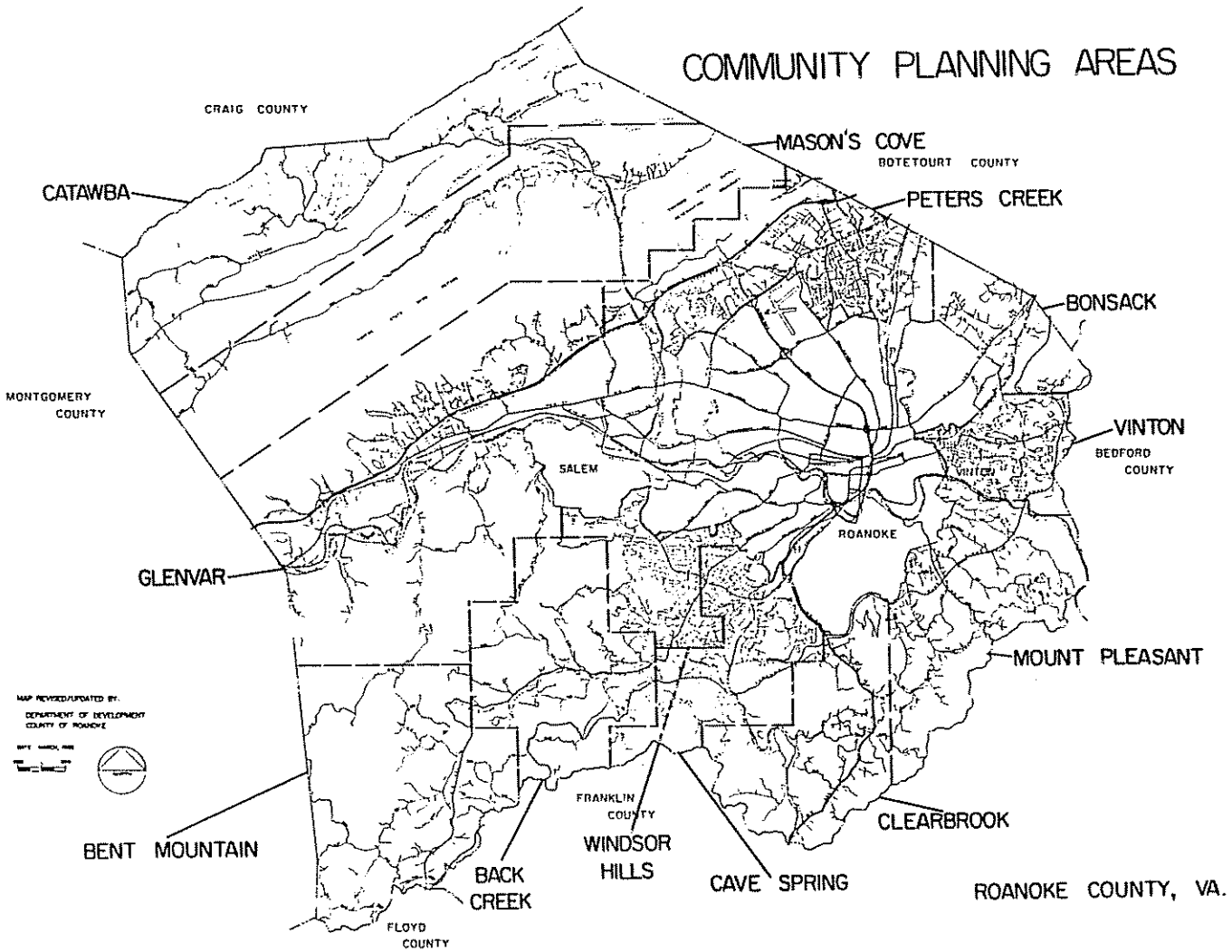
COMMUNITY PLANNING AREAS
CRAIG COUNTY
MASON'S COVE
BOTETOURT COUNTY
CATAWBA
PETERS CREEK
BONSACK
MONTGOMERY COUNTY
VINTON
BEDFORD COUNTY
SALEM
ROANOKE
GLENVAR
MOUNT PLEASANT
MAP REVISED/UPDATED BY:
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
FRANKLIN COUNTY
CLEARBROOK
BENT MOUNTAIN
BACK CREEK
WINDSOR HILLS
CAVE SPRING
ROANOKE COUNTY, VA.
FLOYD COUNTY

FIGURE I-A

Fire Flow Capabilities, and **Existing Sewer Systems** accompany Volume 1, and are on display at the Roanoke County Administration Center, 3738 Brambleton Avenue, S.W., Roanoke, Virginia - Room 600.

Volume 2: Public Participation summarizes the attitudes, opinions, and concerns of County residents with respect to the issues of land use, transportation, environmental management, neighborhood and housing conservation, and public services and facilities. A series of twelve community meetings, attended by 320 County citizens, were conducted between November, 1983 and January, 1984. A meeting was held in each of the community planning areas.

Volume 3: Land Use and Transportation defines the key concerns, community objectives, community standards, and prioritized actions needed to manage residential, commercial, industrial and institutional development within the County and within each of the twelve community planning areas. Transportation programs required to support these management alternatives are defined and scheduled from 1984 to the year 2003. The information contained within this volume will be the foundation for the update and maintenance of the County's land use regulations.

Volume 4: Public Facilities defines the key concerns, community objectives, community standards, and prioritized actions needed to satisfy future demands for fire, law enforcement, park, school, library, and government administrative services and facilities from 1984 to the year 2003. Anticipated needs for water and sewer systems are defined and improvements scheduled for each community planning area from 1984 to the year 2043. The information contained within this volume will become the basis for the continued development of the County's Capital Improvements Program.

Volume 5: Financial Management assesses the current financial condition of Roanoke County. Financial condition is defined as "cash solvency," "long-run solvency," and "service level solvency." These conditions are evaluated through the use of the Financial Trend Monitoring System (FTMS), a management device that combines information from budgetary and financial reports with economic and demographic data to create a series of local government financial indicators that can be used to observe changes in financial conditions. The FTMS provides signals that problems exist, clues as to why, and the time needed to take corrective actions.[1] The FTMS provides County decision-makers with a logical means of incorporating longer-range planning considerations into the annual budget process.

State Planning Legislation

The scope and purpose of the Comprehensive Development Plan is defined by the Code of Virginia, Title 15.1, Article 4, Section 446-1 through Section 457.

"In the preparation of a comprehensive plan the [planning] commission shall make careful and comprehensive surveys and studies of the existing conditions and trends of growth, and of the probable future requirements of its territory and inhabitants. The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants."

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1. Evaluating Local Government Financial Condition, Handbook 1, Sanford Groves, p.5.

"The comprehensive plan shall be general in nature, in that it shall designate the general or approximate location, character, and extent of each feature shown on the plan and shall indicate where existing lands or facilities are proposed to be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed in use as the case may be."

"Such plan, with accompanying maps, plats, charts, and descriptive matter, shall show the [planning] commission's long-range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:

- The designation of areas for various types of public and private development and use, such as different kinds of residential, business, industrial, agricultural, conservation, recreation, public service, flood plain and drainage, and other areas;
- The designation of a system of transportation facilities such as streets roads, parkways, railways, bridges, viaducts, waterways, airports, ports, terminals, and other like facilities;
- The designation of a system of community service facilities such as parks, forest, schools, playgrounds, public buildings, and institutions, hospitals, community centers, waterworks, sewage disposal or waste disposal areas, and the like;
- The designation of historical areas and areas for urban renewal or other treatment;
- An official map, a capital improvements program, a subdivision ordinance, and a zoning ordinance and zoning district maps."

"In the preparation of a comprehensive plan, the local [planning] commission shall survey and study matters as the following:

- Use of land, preservation of agricultural and forestal land, production of food and fiber, characteristics, and conditions of existing development, trends of growth or changes, natural resources, population factors, employment and economic factors, existing public facilities, drainage, flood control and flood damage prevention measures, transportation facilities, the need for housing and any other matters relating to the subject matter and general purposes of the comprehensive plan.
- Probable future economic and population growth of the territory and requirements therefor."

"The comprehensive plan shall recommend methods of implementation. Unless otherwise required by this chapter these may include but need not be limited to:

- An official map;
- A capital improvements program;
- A subdivision ordinance; and
- A zoning ordinance and zoning district maps."

Legal Status of the Comprehensive Development Plan

"Whenever the local [planning] commission shall have recommended a comprehensive plan or part thereof for the county or municipality and such plan shall have been approved and adopted by the governing body, it shall control the general or approximate location, character and extent of each feature shown on the plan. Thereafter, no street, park or other public area, public building or public structure, public utility facility or public service, corporation facility other than railroad facility, whether publicly or privately

owned, shall be constructed,established or authorized, unless and until the general location or approximate location, character, and extent thereof has been submitted to and approved by the local [planning] commission as being substantially in accordance with the adopted comprehensive plan or part thereof. In connection with any such determination the [planning] commission may, and at the direction of the governing body shall, hold a public hearing.

The [planning] commission shall communicate its findings to the governing body, indicating its approval or disapproval with written reasons therefor. The governing body may overrule the action of the [planning] commission by a vote of a majority of the membership thereof. Failure of the [planning] commission to act within sixty days of such submission unless such time shall be extended by the governing body shall be deemed approval. In the case of approval the owner or owners or their agents may appeal the decision of the local [planning] commission to the governing body within ten days after the decision of the [planning] commission. The appeal shall be by written petition to the governing body setting forth the reasons for the appeal. A majority vote of the governing body shall overrule the [planning] commission.

Widening, narrowing, extension, enlargement, vacation or change of use of streets or public areas shall likewise be submitted for approval, but paving, repair, reconstruction, improvement, drainage or similar work and normal service extensions of public utilities or public service corporation shall not require approval unless involving a change in location or extent of a street or public area.

Any public area, facility or use as set forth which is identified within, but not the entire subject of, submission under either 15.1-475 for subdivision or 15.1-491 for development or both may be deemed a feature already shown on the adopted master plan, and therefore, excepted from the requirement for submittal to and approval by the [planning] commission or the governing body;

provided, that the governing body has by ordinance or resolution defined standards governing the construction, establishment or authorization of such public area, facility or use or has approved it through acceptance of a proffer made pursuant to 15.1-491."

"At least once every five years the comprehensive plan shall be reviewed by the local [planning] commission to determine whether it is advisable to amend the plan."

Roanoke County and the Town of Vinton Comprehensive Plans

The Roanoke County Board of Supervisors adopted its first comprehensive plan in 1974. On January 1, 1976, 15.84 square miles of land within Roanoke County was annexed by Roanoke City as a result of a special annexation court order in 1975. Minor modifications of the original comprehensive plan were completed and adopted by amendment in September of 1976. The update of the 1976 plan was approved by the Board of Supervisors in the fall of 1982. Staff work on the Comprehensive Development Plan began in the spring of 1983.

The Town of Vinton adopted it first comprehensive plan in 1975. This plan was revised and the revision adopted by the Town Council in June, 1982. The Comprehensive Plan for the Town of Vinton contains goals, objectives, and policy recommendations which pertain to future land use, community facilities and services, and economic development.

The Roanoke County Comprehensive Development Plan, as provided for in the Code of Virginia, Title 15-1, Article 4, Section 455, will include policies, programs, and plans for the management of those community facilities and services shared by Roanoke County and the Town of Vinton. Decisions relating to land use, transportation, housing conditions, and zoning in the Town will remain the sole responsibility of the Town Council.

CHAPTER 2

POPULATION ANALYSIS

POPULATION ANALYSIS

Introduction

Analysis of current and future population size is the foundation for almost all major planning decisions. Current and future demands for community services and facilities as well as land for residential, commercial, and industrial purposes are directly affected by the size, composition, and spatial distribution of the population. Population size indicates the basic amounts of land required for various types of uses. When a time element is introduced and future population trends are projected, these trends become the basis for calculating future community service, facility, and land use requirements. Population characteristics of age, race, gender, and household size are indices of the types and extent of services and facilities as well as policies required by the community. An examination of population distribution reveals the most functional location for future land uses, community services and community facilities. The population analysis of Roanoke County is necessary for defining the scale, location and temporal considerations of future public and private development within the County.

Standard Metropolitan Statistical Area (SMSA)[1]

In 1970, the Roanoke SMSA included the cities of Roanoke and Salem,

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1. On June 30, 1983, the Office of Management and Budget discontinued the term SMSA. The Roanoke metropolitan area is now defined as a Metropolitan Statistical Area (MSA). The Roanoke MSA no longer includes Craig County. For purposes of comparison, however, the 1980 SMSA definition will continue to be used.

and the County of Roanoke. Currently, Roanoke County is one of six jurisdictions located within the SMSA. The SMSA is composed of one central core city, Roanoke, where the 1980 population exceeded 100,000 persons; the County of Roanoke, in which the central city is situated; the Town of Vinton **(included within all population figures for Roanoke County unless otherwise noted)**; the City of Salem; and the Counties of Craig and Botetourt, adjacent and contiguous areas that are defined as being metropolitan in nature and economically and socially integrated with the central city.

"Metropolitan in nature" is a statistical designation based on non-agricultural employment and residential settlement patterns within the adjacent and contiguous county.

"Social and economic integration" is premised upon a minimum standard which holds that 15 percent of those employed residents of the contiguous and adjacent county must commute to a place of work in the central city. In 1980, 11,859 residents of Craig and Botetourt counties reported a place of employment. Of these persons, 30 percent or 3,549 worked in the central city of Roanoke.

The overlapping of county and municipal governmental units has diminished jurisdictional self-sufficiency and has encouraged the growth of regional systems. Although its political boundaries are well defined, Roanoke County's community boundaries actually extend beyond these lines, encompassing the urban centers of Roanoke and Salem, where County residents work, shop, and purchase services. The extent and location of Roanoke County's future population growth will depend largely upon the type and magnitude of development that occurs within these centers.

Population Growth 1970-1981

Between 1970 and 1980, jurisdictions within the Roanoke SMSA (as defined by the 1980 census) experienced an increase in population of 21,188, an increase of 10.4 percent or an average growth rate of 1.0 percent per year. The combined population of the six jurisdictions in 1970 was 203,153. The 1980 final population count, as prepared by the Bureau of the Census, indicated that 224,341 persons resided in the SMSA. The Tayloe Murphy Institute estimated that the population of the SMSA as of July 1, 1981, was 225,500, a net gain of .52 percent from the previous year.

The 1970 official census count for Roanoke County was 67,339 persons. However, on January 1, 1976, Roanoke City annexed 15.84 square miles of Roanoke County that had a 1970 population of 13,522 persons. The 1970 population of the County, adjusted to account for this loss, was 53,817. The 1980 final population count for the County was 72,945 persons. This figure represents an increase of 19,128 persons, a gain of 35.5 percent or an average annual growth rate of 3.6 percent when compared to the adjusted 1970 population. The Tayloe Murphy Institute estimated that the population of Roanoke County as of July 1, 1981, was 73,900, a net gain of 1.3 percent from the previous year (see Figure 2-A).

Current Population Size-Roanoke County

The 1980 population of Roanoke County was 72,945. From March, 1980 to July, 1983, 1,315 new units of single family, multi-family, and duplex housing were constructed in both the Town of Vinton and the County. An additional seventy-seven mobile homes were permitted and 140 more units were either demolished, destroyed by fire or converted to commercial use during the same period. An average of 2.46 persons resided in each dwelling unit in the Town of Vinton in 1983. In the County in 1983, an average of 2.855 persons resided

POPULATION GROWTH

DECENNIAL PERCENTAGE INCREASE

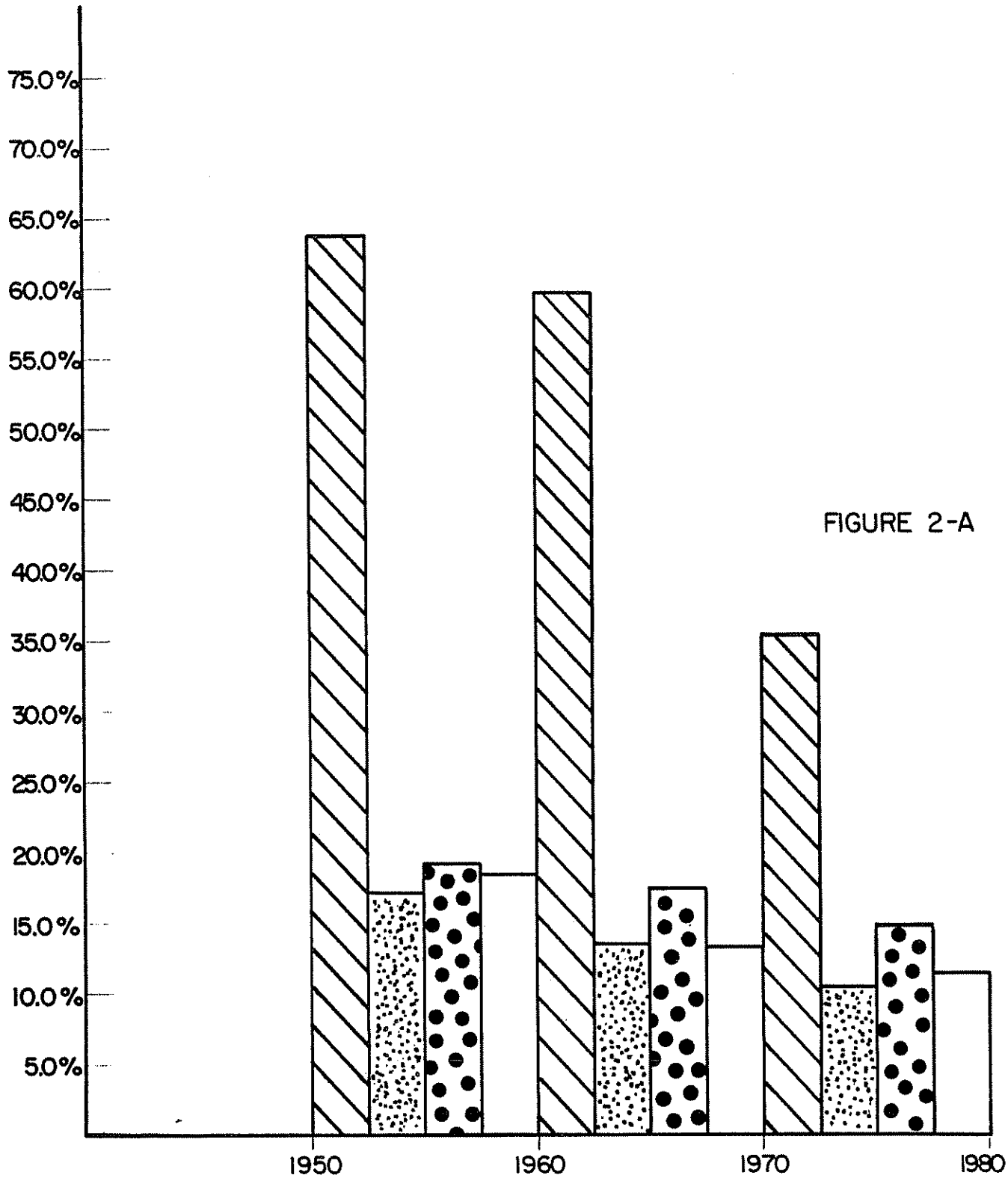

FIGURE 2-A

Sources: Tayloe Murphy Institute
Census Bureau

in each non-institutional housing unit while an average of 1.44 persons lived in each institutional unit.

By applying this data to the number of housing units constructed since March, 1980, the Roanoke County Department of Development estimated that 76,429 persons resided in Roanoke County (including Town of Vinton) on July 1, 1983. Of these persons it was estimated that 68,343 lived in Roanoke County outside of the Vinton corporate limits.

Trend Comparisons

For comparison, growth rates during the 1970-1980 period for nearby localities in central and southwestern Virginia are as follows:

Area Trend Comparisons

Location	Population 1970[1]	Population 1980	% Change 1970-1980	% Annual Growth
Roanoke County	53,817	72,945	35.5	3.6
Roanoke City	105,637	100,220	-4.9	-0.5
Salem City	21,982	23,958	9.0	0.9
Craig County	3,524	3,948	12.0	1.2
Botetourt County	18,193	23,270	27.9	2.8
Roanoke SMSA[2]	203,153	224,341	10.0	1.0
Bedford County	25,242	34,927	38.4	3.8
Franklin County	28,163	35,740	26.9	2.7
Montgomery County	46,813	63,516	35.7	3.6
Floyd County	9,775	11,563	18.3	1.8
Lynchburg City	64,640	66,743	3.3	0.3
State of Virginia	4,651,448	5,346,818	14.9	1.5

SOURCES: Bureau of the Census
Tayloe Murphy Institute

1 1970 population of Roanoke County and City of Roanoke adjusted to account for 15.84 square miles populated by 13,522 persons removed from County and annexed to the City January 1, 1976.

2 Roanoke SMSA as defined by the 1980 Census.

Roanoke County experienced the largest increase in population, 19,128 persons. Bedford County experienced the largest percentage increase, 38.4 percent or an averge of 3.8 percent per year. The cities of Lynchburg and Salem experienced the smallest increases. Roanoke City actually decreased in population by almost 5 percent (see Figure 2-B).

Natural Increase and Net Migration

Natural increase is defined as the difference between the number of births and the number of deaths. Natural increase will be positive if the number of births exceeds the number of deaths within a given time period. Net migration is defined as the number of people who moved into an area minus the number of individuals who moved out.

Eighty percent of Roanoke County's population increase between 1970 and 1980 resulted from a positive net migration. Positive natural increase accounted for the remaining growth.

Natural Increase and Net Migration-Roanoke SMSA

Location	Numerical Change 1970-1980	Natural Increase	Net Migration
Roanoke County	19,128	3,827	15,301
Roanoke City	-5,210	2,452	-7,662
Salem City	1,976	781	1,195
Craig County	424	80	344
Botetourt County	5,077	742	4,336
Roanoke SMSA	21,395	7,882	13,514

SOURCE: Tayloe Murphy Institute

One hundred percent of Roanoke City's population decrease between 1970 and 1980 was attributable to negative net migration. A positive natural increase prevented the decrease from being any more pronounced.

AREA POPULATION GROWTH
1960 - 2000

FIGURES ADJUSTED FOR ANNEXATION

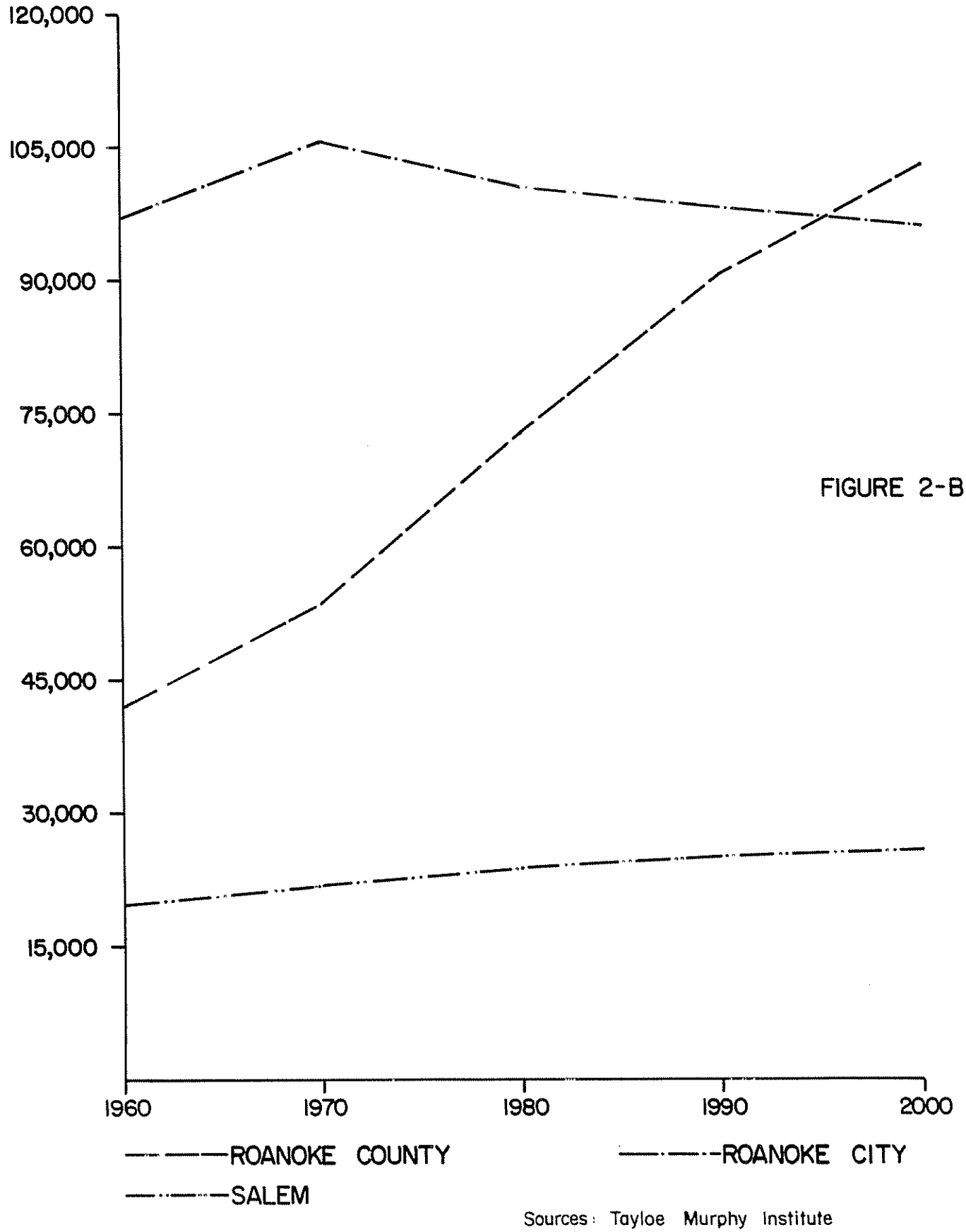

FIGURE 2-B

Sources: Tayloe Murphy Institute
Virginia Dept. of Planning & Budget

Following the same patterns exhibited throughout Virginia, the counties of Roanoke, Botetourt, and Craig gained population primarily through in-migration, while the independent city of Roanoke lost population via out-migration.

Twenty percent of Roanoke County's population increase between 1970 and 1980 resulted from a positive natural increase. It is important to note, however, that the County's average annual natural increase declined drastically during the study period, from 784 in 1970 to only 275 in 1981. Major advances in medical technology, increased health service availability and the national trend of reduced fertility levels and smaller families probably account for this trend. The table, **Birth and Death Rates Per 1,000 Persons**, describes this and other trends in the metropolitan area.

Birth and Death Rates Per 1000 Persons

	1970					1981				
	Births		Deaths			Births		Deaths		
	No.	Rate	No.	Rate	Natural Increase	No.	Rate	No.	Rate	Natural Increase
Roanoke County	1,226	18.5	442	6.7	784	812	10.9	537	7.2	275
Roanoke	1,761	19.4	1,231	13.6	530	1,335	13.2	1,216	12.1	119
Salem	360	18.1	176	8.8	184	250	10.4	225	9.4	25
Botetourt County	265	14.5	178	9.9	87	238	9.9	204	8.5	34
Craig County	45	12.8	39	11.1	6	38	10.3	51	13.8	-13
TOTAL	3,657	Minus	2,066	Equals	1,591	2,673	Minus	2,233	Equals	440

SOURCE: Virginia Department of Health

Population Characteristics

Age

The most dramatic change in Roanoke County's age characteristics from 1970 to 1980 was the 50.9 percent increase in the number of persons ages 65 years and older.[1] This group represented 9.5 percent of the County's 1980 population, much less than the Roanoke City Figure of 15.6 percent or the Salem City figure of 13.0 percent, but slightly higher than the statewide average of 9.4 percent. Partially counterbalancing this large increase of elderly County residents was a 20.0 percent decrease in the total number of County residents 14 years of age and younger. The number of persons in this age group residing in the cities of Roanoke and Salem also declined 13.1 percent during the study period.

In general, the population of Roanoke County has grown older. The 1980 median age was 32.3 years, a significant increase from the 1970 figure of 28.3 years. Contributing to this trend were significant increases in the number of County residents ages 25 to 34 years, as well as those ages 55 to 64 years. The 1980 median ages of residents of the cities of Roanoke, Salem, and the State of Virginia were 32.6 years, 32.9 years, and 29.8 years, respectively.

These trends are described in the tables, **Median Age, Age Group Distributions - Roanoke County, and Age Group Distributions - Roanoke SMSA.**

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2. Comparison completed using pre-1976 annexation population characteristics.

Median Age (Years)

	1970	1980	Number Change	Percent Change
Roanoke County	28.3	32.3	4.0	14.1
Roanoke	32.7	32.6	-0.1	—
Salem	29.4	32.9	3.5	11.9
Botetourt County	30.3	32.5	2.2	7.3
Craig County	32.2	32.8	0.6	1.9

SOURCE: Bureau of the Census

Age Group Distributions-Roanoke County

1970-1980

Age Group	# of Persons 1970[1]	# of Persons 1980	% of Total 1970	% of Total 1980	1970 - 1980 Percent Change
0-5	5,583	3,988	8.3	5.5	-2.9
5-14	14,273	11,861	21.2	16.3	-16.9
15-24	10,541	11,924	15.7	16.4	13.1
25-34	9,737	12,307	14.5	16.9	26.4
35-44	9,737	10,474	14.5	14.4	7.6
45-54	7,886	8,614	11.6	11.7	9.2
55-64	4,925	6,749	7.3	9.3	37.0
Over 65	4,657	7,028	6.8	9.5	50.9
TOTAL	67,339	72,945	100.0	100.0	8.3

1. 1970 population reflects pre-1976 annexation characteristics of Roanoke County.

SOURCE: Bureau of the Census

Age Group Distributions-Roanoke SMSA[1]

1970-1980

Age Group	# of Persons 1970	# of Persons 1980	% of Total 1970	% of Total 1980	1970 - 1980 Percent Change
0-5	15,785	13,250	7.8	5.9	-16.1
5-14	37,890	32,816	18.7	14.6	-13.4
15-24	33,586	37,408	16.5	16.7	11.4
25-34	25,304	37,273	12.5	16.6	47.3
35-44	25,075	26,324	12.3	11.7	5.0
45-54	24,651	24,868	12.1	11.1	1.0
55-64	19,162	23,634	9.4	10.5	23.3
Over 65	21,700	28,768	10.7	12.9	32.6
TOTAL	203,153	224,341	100.0	100.0	10.4

1. SMSA as defined by the 1980 Census.

SOURCE: Bureau of the Census

Gender and Race

In 1980, 52.1 percent of Roanoke County's population was female, while less than 3 percent was non-white. As a comparison, almost 53 percent of the population of the Roanoke SMSA was female while more than 12 percent was non-white. The highest concentrations of females and non-whites residing in the SMSA were found within Roanoke City. The following table describes these findings:

Gender and Race Characteristics

1980

Characteristics	Roanoke County	Roanoke SMSA
Male	34,957	106,028
Percent	47.9	47.3
Female	37,988	118,313
Percent	52.1	52.7
White	70,877	197,172
Percent	97.2	87.9
Black	1,685	25,912
Percent	2.3	11.6
Non-white	2,068	27,169
Percent	2.8	12.1

SOURCE: Bureau of the Census

Household Size

Paralleling a national trend, the average household size in Roanoke County has decreased during the last decade. The average household size in the Roanoke SMSA has also declined. Household sizes based on United States census figures are described by the table, **Average Household Size.**

Average Household Size

Location	Population		Number of Housing Units [2]		Persons/Unit[3]	
	1970	1980	1970	1980	1970	1980
Roanoke County [1]	53,817	72,945	17,143	26,800	3.14	2.72
Roanoke SMSA	203,153	224,341	69,408	89,094	2.93	2.51

SOURCE: Bureau of the Census

1. 1970 population and housing unit count adjusted to account for 15.84 square miles removed from County and annexed to the City, January 1, 1976.
2. Includes seasonal, vacation, and vacant units. Persons per occupied units (25,237) in 1980 was 2.89.
3. In Roanoke County in 1980, 2.862 persons lived in each non-institutional year-round housing unit, while 1.44 persons resided in each institutional unit. In the Town of Vinton in 1980,2.46 persons lived in each non-institutional year-round and institutional unit. In 1983, these figures were 2.855, 1.44, and 2.46, respectively.

In Roanoke County, as in other areas of the nation, smaller families, i.e., childless married couples and increased numbers of singles, have placed a burden upon the housing market, as well as the public services required on a per unit basis. Since 1970, the County's population has increased by 19,128 persons while an additional 9,657 dwelling units have become available. Of these units, it is estimated that 9,097 are occupied (1980 vacancy rate of 5.7 percent). An average of .48 persons has occupied each new unit made available between 1970 and 1980. The continuation of this trend will require many more housing units suitable for smaller families as well as land environmentally adequate for new development.

Population Distribution and Density

Roanoke County has been divided into thirteen census tract by the United States Census Bureau (see Figure 2C). The distribution and density of development is described by the table **1980 Population Distribution and Density–Roanoke County.**

Major areas of growth are located in or adjacent to existing urbanized areas within Census Tracts 302.2, 307, 308 and 311. These areas contain 51 percent of the County's population but comprise less than 6.0 percent of the County's total land area. Detailed distribution data describing occupied households and age are presented in the tables **1980 Distribution of Occupied Households by Size–Roanoke County and 1980 Population Distribution by Age–Roanoke County.**

Two-person households comprise approximately one-third of all households located in Roanoke County. Distribution of total occupied households corresponds closely with the population density and distribution data described above. Census Tract 302.02 contains the largest number of persons ages

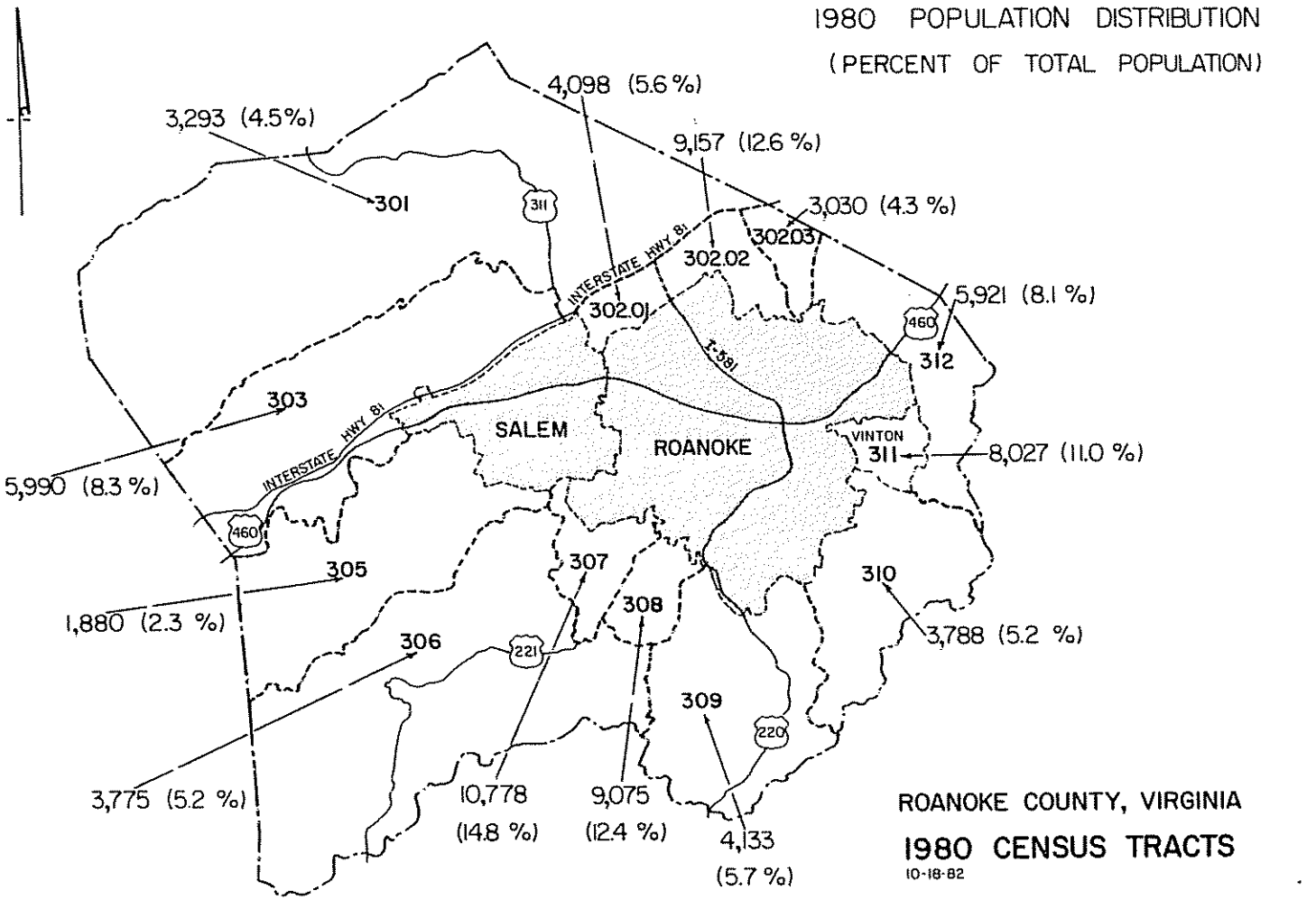
1980 POPULATION DISTRIBUTION
(PERCENT OF TOTAL POPULATION)
4,098 (5.6 %)
3,293 (4.5 %)
9,157 (12.6 %)
301
311
3,030 (4.3 %)
302.03
INTERSTATE HWY 81
302.02
302.01
5,921 (8.1 %)
460
I-581
312
303
SALEM
ROANOKE
VINTON
311
8,027 (11.0 %)
INTERSTATE HWY 81
5,990 (8.3 %)
460
305
307
310
308
1,880 (2.3 %)
306
221
3,788 (5.2 %)
309
220
3,775 (5.2 %)
10,778
(14.8 %)
9,075
(12.4 %)
4,133
(5.7 %)
ROANOKE COUNTY, VIRGINIA
1980 CENSUS TRACTS
10-18-82

FIGURE 2-C

1980 Population Distribution and Density - Roanoke County

Census Tract Number	Area in Square Miles	Population	Persons Per Square Mile	Tract as a Percent of County Population	Area
301	79.84	3,293	41	4.5	32.2
302.01	2.47	4,098	1,659	5.6	1.0
302.02	2.39	9,157	3,831	12.6	1.0
302.03	5.11	3,030	593	4.3	2.1
303	29.37	5,990	204	8.3	11.8
305	23.28	1,880	81	2.3	9.4
306	48.63	3,775	78	5.2	19.6
307	5.23	10,778	2,061	14.8	2.1
308	4.06	9,075	2,235	12.4	1.6
309	19.06	4,133	217	5.7	7.7
310	14.16	3,788	268	5.2	5.7
311	3.07	8,027	2,615	11.0	1.2
312	11.61	5,921	510	8.1	4.7
Total	248.28	72,945	294	100.0	100.0

Sources: Bureau of Census
Area Calculations by Roanoke County, Department of Development

1980 Population Distribution by Age - Roanoke County

Census Tract	Age 18 & Under Number	Age 18 & Under Percent	Age 19 - 34 Number	Age 19 - 34 Percent	Age 35 - 54 Number	Age 35 - 54 Percent	Age 55 - 64 Number	Age 55 - 64 Percent	Age 65 & Over Number	Age 65 & Over Percent
301	943	28.6	793	24.1	758	23.0	321	9.7	478	14.6
302.01	1,439	35.1	1,044	25.5	1,167	28.5	269	6.6	179	4.3
302.02	2,329	25.4	2,077	22.7	2,388	26.1	946	10.3	1,417	15.5
302.03	733	24.2	1,071	35.3	725	23.9	271	8.9	230	7.7
303	1,802	30.0	1,332	22.2	1,567	26.1	515	8.6	774	13.1
305	578	30.7	516	27.4	482	25.6	149	7.9	155	8.4
306	1,127	29.8	1,005	26.6	1,000	26.5	300	7.9	343	9.2
307	3,038	28.2	2,638	24.5	3,017	28.0	1,199	11.1	886	8.2
308	2,594	28.6	2,578	28.4	2,467	27.2	796	8.8	640	7.0
309	1,149	27.8	1,110	26.9	1,077	26.1	414	10.0	383	9.2
310	1,153	30.4	1,035	27.3	934	24.7	328	8.6	338	9.0
311	2,261	28.2	2,279	28.4	1,809	22.5	785	9.8	893	11.1
312	2,020	34.1	1,436	24.3	1,697	28.7	456	7.7	312	5.2
County Total	21,166	29.0	18,914	25.9	19,088	26.2	6,749	9.3	7,028	9.6

Source: Bureau of the Census

1980 Distribution of Occupied Households by Size - Roanoke County

Census Tract	1 Persons	2 Persons	3 Persons	4 Persons	5 Persons	6 or more Persons	Total Occupied
301	132	324	203	189	97	54	999
302.01	88	350	319	355	135	41	1288
302.02	531	1076	701	594	193	69	3164
302.03	135	297	157	160	68	20	837
303	259	531	384	443	170	80	1867
305	95	213	135	137	49	25	654
306	198	435	299	232	102	58	1324
307	593	1372	795	732	288	90	3870
308	753	1077	681	583	234	97	3425
309	309	489	295	243	115	61	1512
310	177	410	252	302	99	50	1290
311	742	1010	625	466	174	85	3102
312	147	559	477	485	171	66	1905
Total	4159	8143	5323	4921	1895	796	25,237
% of Total Occupied Households	16.4	32.3	21.1	19.5	7.5	3.2	100.00

Source: Bureau of Census

65 years and older while census tract 307 has the greatest number of persons ages 18 years and younger.

Projected Population

The following projected populations will be used in developing future plans and policies for Roanoke County:

Year	Roanoke County	Roanoke SMSA
1980	72,945	224,341
1983	76,429	
1985	81,690	233,770
1990	90,800	246,600
1995	96,897	252,969
2000	103,000	261,400
2003	105,400	

SOURCE: Virginia Department of Planning and Budget
Roanoke County, Department of Development

Roanoke County's population growth rate is expected to exceed that of the State and the SMSA from 1980 to 2000. The County's population is projected to increase by 30,055, or 41.2 percent between 1980 and 2000. Of this increase, approximately 29,459 will result from migration and only 596 from natural increase. Of those migrating into the County, 16,152 or 55 percent will do so before 1990. Birth rates are projected to decrease from 1979-1981 levels by the year 2000. The portion of the County's population in the 20 to 64 age group and the 65 and over age group will increase by the year 2000 while the portion in the 0 to 19 age group will decline. The County will experience a slight increase in school aged population from 18,334 to 19,245 by the year 2000. The County's working population (ages 22 to 64) will increase by 19,614 persons, or 47.4 percent by the year 2000.

The projected population for the year 2003 was prepared to accomodate the twenty year planning period, 1983-2003. A population profile, 1983-2003, of each community planning area follows the detailed projected population portion of this chapter.

Roanoke County

DETAILED PROJECTIONS - Age, Race, Gender

The following section provides detailed population projections for Roanoke County to the year 2005. These projections, which were prepared in five year increments by the Virginia Department of Planning and Budget, examine the characteristics of age, race and gender.

Two methodologies were used in developing these projections, the economic base approach and cohort-component procedure. The economic base method considered the short-range relationships between population and employment by categorically projecting employment and unemployment. A population-work force multiplier was selected and applied to the projected work force figure to produce the projected population. The projection was modified to reflect specific demographic trends, commuting patterns, and special characteristics. Longer-term projections were made at the State level on the basis of anticipated trends of fertility, survival, migration rates, and with consideration of past changes in population. Once State projections were completed, individual county and city projections were developed by way of a modified ratio methodology. The projections for Roanoke County detailing age, race, and gender are as follows:

PROJECTED POPULATION BY AGE, COLOR, AND SEX JULY 1, 1985

AGE	TOTAL	WHITE			NONWHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
TOTAL	81690	79483	37497	41986	2207	1019	1188
0- 4	4455	4304	2211	2093	151	76	75
5- 9	5727	5585	2874	2711	142	73	69
10-14	6173	6022	3089	2933	151	78	73
15-19	6102	5938	2864	3074	164	74	90
20-24	5972	5762	2507	3255	210	97	113
25-29	6748	6524	2985	3539	224	93	131
30-34	6777	6559	3150	3409	218	101	117
35-39	7296	7120	3393	3727	176	85	91
40-44	6124	6017	2955	3062	107	55	52
45-49	4888	4800	2337	2463	88	47	41
50-54	4429	4353	2126	2227	76	35	41
55-59	4273	4182	2002	2180	91	49	42
60-64	3860	3765	1775	1990	95	41	54
65-69	2898	2800	1219	1581	98	42	56
70-74	2248	2162	880	1282	86	36	50
75-79	1626	1574	532	1042	52	18	34
80-84	1094	1057	350	707	37	12	25
85+	1000	959	248	711	41	7	34
PERCENTAGE DISTRIBUTION							
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0- 4	5.5	5.4	5.9	5.0	6.8	7.5	6.3
5- 9	7.0	7.0	7.7	6.5	6.4	7.2	5.8
10-14	7.6	7.6	8.2	7.0	6.8	7.7	6.1
15-19	7.5	7.5	7.6	7.3	7.4	7.3	7.6
20-24	7.3	7.2	6.7	7.8	9.5	9.5	9.5
25-29	8.3	8.2	8.0	8.4	10.1	9.1	11.0
30-34	8.3	8.3	8.4	8.1	9.9	9.9	9.8
35-39	8.9	9.0	9.0	8.9	8.0	8.3	7.7
40-44	7.5	7.6	7.9	7.3	4.8	5.4	4.4
45-49	6.0	6.0	6.2	5.9	4.0	4.6	3.5
50-54	5.4	5.5	5.7	5.3	3.4	3.4	3.5
55-59	5.2	5.3	5.3	5.2	4.1	4.8	3.5
60-64	4.7	4.7	4.7	4.7	4.3	4.0	4.5
65-69	3.5	3.5	3.3	3.8	4.4	4.1	4.7
70-74	2.8	2.7	2.3	3.1	3.9	3.5	4.2
75-79	2.0	2.0	1.4	2.5	2.4	1.8	2.9
80-84	1.3	1.3	0.9	1.7	1.7	1.2	2.1
85+	1.2	1.2	0.7	1.7	1.9	0.7	2.9

CHANGE IN POPULATION SINCE APR. 1, 1980

TOTAL	WHITE			NONWHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
8756	8616	3513	5103	140	57	83
467	448	216	232	19	-1	20
171	208	148	60	-37	-6	-31
-132	-111	-49	-62	-21	-10	-11
-370	-353	-256	-97	-17	-11	-6
523	491	146	345	32	25	7
1084	1063	403	660	21	2	19
139	101	81	20	38	20	18
1551	1490	615	875	61	28	33
1397	1384	701	683	13	2	11
543	539	223	316	4	12	-8
161	177	60	117	-16	-13	-3
438	427	143	284	11	11	0
946	952	457	495	-6	-10	4
554	566	214	352	-12	-7	-5
442	421	217	204	21	14	7
280	272	45	227	8	-1	9
267	252	83	169	15	1	14
295	289	66	223	6	1	5
PERCENT CHANGE						
12.0	12.2	10.3	13.8	6.8	5.9	7.5
11.7	11.6	10.8	12.5	14.4	-1.3	36.4
3.1	3.9	5.4	2.3	-20.7	-7.6	-31.0
-2.1	-1.8	-1.6	-2.1	-12.2	-11.4	-13.1
-5.7	-5.6	-8.2	-3.1	-9.4	-12.9	-6.3
9.6	9.3	6.2	11.9	18.8	34.7	6.6
19.1	19.5	15.6	22.9	10.3	2.2	17.0
2.1	1.6	2.6	0.6	21.1	24.7	18.2
27.0	26.5	22.1	30.7	53.0	49.1	56.9
29.6	29.9	31.1	28.7	13.8	3.8	26.8
12.5	12.6	10.5	14.7	4.8	34.3	-16.3
3.8	4.2	2.9	5.5	-17.4	-27.1	-6.8
11.4	11.4	7.7	15.0	13.8	28.9	0.0
32.5	33.8	34.7	33.1	-5.9	-19.6	8.0
23.6	25.3	21.3	28.6	-10.9	-14.3	-8.2
24.5	24.2	32.7	18.9	32.3	63.6	16.3
20.8	20.9	9.2	27.9	18.2	-5.3	36.0
32.3	31.3	31.1	31.4	68.2	9.1	127.3
41.8	43.1	36.3	45.7	17.1	16.7	17.2

ROANOKE COUNTY

PROJECTED POPULATION BY AGE, COLOR, AND SEX JULY 1, 1990

AGE	TOTAL	WHITE			NONWHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
TOTAL	90800	88424	41629	46795	2376	1075	1301
0- 4	4704	4537	2330	2207	167	84	83
5- 9	6115	5959	3057	2902	156	79	77
10-14	5425	5307	2723	2584	118	57	61
15-19	6471	6289	3052	3237	182	77	105
20-24	5894	5739	2574	3165	155	61	94
25-29	6631	6392	3050	3342	239	108	131
30-34	8021	7750	3626	4124	271	112	159
35-39	7835	7605	3693	3912	230	111	119
40-44	7968	7797	3724	4073	171	88	83
45-49	6439	6343	3108	3235	96	52	44
50-54	4992	4911	2391	2520	81	41	40
55-59	4490	4422	2130	2292	68	34	34
60-64	4274	4183	1939	2244	91	51	40
65-69	3864	3755	1685	2070	109	44	65
70-74	2839	2743	1099	1644	96	34	62
75-79	2129	2056	746	1320	63	23	40
80-84	1428	1391	391	1000	37	12	25
85+	1281	1235	311	924	46	7	39

CHANGE IN POPULATION SINCE APR. 1, 1980

	TOTAL	WHITE			NONWHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
TOTAL	17866	17557	7645	9912	309	113	196
0- 4	716	681	335	346	35	7	28
5- 9	559	582	331	251	-23	0	-23
10-14	-880	-826	-415	-411	-54	-31	-23
15-19	-1	-2	-68	66	1	-8	9
20-24	445	468	213	255	-23	-11	-12
25-29	967	931	468	463	36	17	19
30-34	1383	1292	557	735	91	31	60
35-39	2090	1975	915	1060	115	54	61
40-44	3241	3164	1470	1694	77	35	42
45-49	2094	2082	994	1088	12	17	-5
50-54	724	735	325	410	-11	-7	-4
55-59	655	667	271	396	-12	-4	-8
60-64	1360	1370	621	749	-10	0	-10
65-69	1520	1521	680	841	-1	-5	4
70-74	1033	1002	436	566	31	12	19
75-79	783	764	259	505	19	4	15
80-84	601	586	124	462	15	1	14
85+	576	565	129	436	11	1	10

PERCENTAGE DISTRIBUTION

TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0- 4	5.2	5.1	5.6	4.7	7.0	7.8	6.4
5- 9	6.7	6.7	7.3	6.2	6.6	7.3	5.9
10-14	6.0	6.0	6.5	5.5	5.0	5.3	4.7
15-19	7.1	7.1	7.3	6.9	7.7	7.2	8.1
20-24	6.5	6.5	6.2	6.8	6.5	5.7	7.2
25-29	7.3	7.2	7.3	7.1	10.1	10.0	10.1
30-34	8.8	8.8	8.7	8.8	11.4	10.4	12.2
35-39	8.6	8.6	8.9	8.4	9.7	10.3	9.1
40-44	8.8	8.8	8.9	8.7	7.2	8.2	6.4
45-49	7.1	7.2	7.5	6.9	4.0	4.8	3.4
50-54	5.5	5.6	5.7	5.4	3.4	3.8	3.1
55-59	4.9	5.0	5.1	4.9	2.9	3.2	2.6
60-64	4.7	4.7	4.7	4.8	3.8	4.7	3.1
65-69	4.3	4.2	4.0	4.4	4.6	4.1	5.0
70-74	3.1	3.1	2.6	3.5	4.0	3.2	4.8
75-79	2.3	2.3	1.8	2.8	2.7	2.1	3.1
80-84	1.6	1.6	0.9	2.1	1.6	1.1	1.9
85+	1.4	1.4	0.7	2.0	1.9	0.7	3.0

PERCENT CHANGE

TOTAL	24.5	24.8	22.5	26.9	14.9	11.7	17.7
0- 4	18.0	17.7	16.8	18.6	26.5	9.1	50.9
5- 9	10.1	10.8	12.1	9.5	-12.8	0.0	-23.0
10-14	-14.0	-13.5	-13.2	-13.7	-31.4	-35.2	-27.4
15-19	-0.0	-0.0	-2.2	2.1	0.6	-9.4	9.4
20-24	8.2	8.9	9.0	8.8	-12.9	-15.3	-11.3
25-29	17.1	17.0	18.1	16.1	17.7	18.7	17.0
30-34	20.8	20.0	18.1	21.7	50.6	38.3	60.6
35-39	36.4	35.1	32.9	37.2	100.0	94.7	105.2
40-44	68.6	68.3	65.2	71.2	81.9	66.0	102.4
45-49	48.2	48.9	47.0	50.7	14.3	48.6	-10.2
50-54	17.0	17.6	15.7	19.4	-12.0	-14.6	-9.1
55-59	17.1	17.8	14.6	20.9	-15.0	-10.5	-19.0
60-64	46.7	48.7	47.1	50.1	-9.9	0.0	-20.0
65-69	64.8	68.1	67.7	68.4	-0.9	-10.2	6.6
70-74	57.2	57.6	65.8	52.5	47.7	54.5	44.2
75-79	58.2	58.7	53.2	62.0	43.2	21.1	60.0
80-84	72.7	72.8	46.4	85.9	68.2	9.1	127.3
85+	81.7	84.3	70.9	89.3	31.4	16.7	34.5

NET MIGRATION, APR. 1,1980-JULY 1,1990...WHITE 15919. NONWHITE 232. TOTAL 16152.

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85&OVER
WM	167	1018	756	380	-504	-22	1266	1168	753	426	259	232	211	265	204	192	109	100
WF	160	971	757	633	201	197	1217	1054	755	418	196	240	284	363	370	389	333	375
NM	-7	-1	-18	0	-24	24	41	23	9	-2	-7	3	13	16	3	0	2	-2
NF	-6	-2	6	7	9	36	54	9	-14	-13	0	-10	0	29	25	1	0	23

NOVEMBER,1982

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ROANOKE COUNTY

PROJECTED POPULATION BY AGE, COLOR, AND SEX JULY 1, 1995

AGE	TOTAL	WHITE			NONWHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
TOTAL	96997	94577	44047	50530	2410	1080	1330
0- 4	4787	4636	2392	2254	151	76	75
5- 9	6222	6049	3107	2942	173	87	86
10-14	5821	5679	2910	2769	142	63	79
15-19	6653	6512	3170	3342	141	50	91
20-24	5767	5599	2435	3164	168	84	84
25-29	6753	6562	2998	3564	191	76	115
30-34	7523	7295	3515	3780	228	101	127
35-39	8504	8257	3857	4400	247	111	136
40-44	8024	7826	3782	4044	198	100	98
45-49	7916	7791	3719	4062	155	76	79
50-54	6593	6296	3042	3254	87	50	37
55-59	4900	4817	2277	2540	83	45	38
60-64	4372	4286	1974	2312	86	38	48
65-69	4059	3966	1715	2251	93	43	50
70-74	3543	3458	1410	2048	85	32	53
75-79	2498	2374	844	1530	74	26	48
80-84	1668	1617	527	1090	51	14	37
85+	1624	1567	383	1184	57	8	49

PERCENTAGE DISTRIBUTION

TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0- 4	4.9	4.9	5.4	4.5	6.3	7.0	5.6
5- 9	6.4	6.4	7.1	5.8	7.2	8.1	6.5
10-14	6.0	6.0	6.6	5.5	5.9	5.8	5.9
15-19	6.9	6.9	7.2	6.6	5.9	4.6	6.8
20-24	5.9	5.9	5.5	6.3	7.0	7.8	6.3
25-29	7.0	6.9	6.8	7.1	7.9	7.0	8.6
30-34	7.8	7.7	8.0	7.5	9.5	9.4	9.5
35-39	8.8	8.7	8.8	8.7	10.2	10.3	10.2
40-44	8.3	8.3	8.6	8.0	8.2	9.3	7.4
45-49	8.2	8.2	8.4	8.0	6.4	7.0	5.9
50-54	6.8	6.7	6.9	6.4	3.6	4.6	2.8
55-59	5.1	5.1	5.2	5.0	3.4	4.2	2.9
60-64	4.5	4.5	4.5	4.6	3.6	3.5	3.6
65-69	4.2	4.2	3.9	4.5	3.9	4.0	3.8
70-74	3.7	3.7	3.2	4.1	3.5	3.0	4.0
75-79	2.5	2.5	1.9	3.0	3.1	2.4	3.6
80-84	1.7	1.7	1.2	2.2	2.1	1.3	2.8
85+	1.7	1.7	0.9	2.3	2.4	0.7	3.7

CHANGE IN POPULATION SINCE JULY 1, 1990

TOTAL	WHITE			NONWHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
6187	6153	2418	3735	34	5	29
83	99	52	47	-16	-8	-8
107	90	50	40	17	8	9
396	372	187	185	24	6	18
182	223	118	105	-41	-27	-14
-127	-140	-139	-1	13	23	-10
122	170	-52	222	-48	-32	-16
-498	-455	-111	-344	-43	-11	-32
669	652	164	488	17	0	17
56	29	58	-29	27	12	15
1497	1438	611	827	59	24	35
1391	1385	651	734	6	9	-3
410	395	147	248	15	11	4
98	103	35	68	-5	-13	8
195	211	30	181	-16	-1	-15
704	715	311	404	-11	-2	-9
319	308	98	210	11	3	8
240	226	136	90	14	2	12
343	332	72	260	11	1	10

PERCENT CHANGE

6.8	7.0	5.8	8.0	1.4	0.5	2.2
1.8	2.2	2.2	2.1	-9.6	-9.5	-9.6
1.7	1.5	1.6	1.4	10.9	10.1	11.7
7.3	7.0	6.9	7.2	20.3	10.5	29.5
2.8	3.5	3.9	3.2	-22.5	-35.1	-13.3
-2.2	-2.4	-5.4	-0.0	8.4	37.7	-10.6
1.8	2.7	-1.7	6.6	-20.1	-29.6	-12.2
-6.2	-5.9	-3.1	-8.3	-15.9	-9.8	-20.1
8.5	8.6	4.4	12.5	7.4	0.0	14.3
0.7	0.4	1.6	-0.7	15.8	13.6	18.1
23.2	22.7	19.7	25.6	61.5	46.2	79.5
27.9	28.2	27.2	29.1	7.4	22.0	-7.5
9.1	8.9	6.9	10.8	22.1	32.4	11.8
2.3	2.5	1.8	3.0	-5.5	-25.5	20.0
5.0	5.6	1.8	8.7	-14.7	-2.3	-23.1
24.8	26.1	28.3	24.6	-11.5	-5.9	-14.5
15.0	14.9	13.1	15.9	17.5	13.0	20.0
16.8	16.2	34.8	9.0	37.8	16.7	48.0
26.8	26.9	23.2	28.1	23.9	14.3	25.6

ROANOKE COUNTY

PROJECTED POPULATION BY AGE, COLOR, AND SEX JULY 1, 2000 — CHANGE IN POPULATION SINCE JULY 1, 1990

AGE	TOTAL	WHITE TOTAL	WHITE MALE	WHITE FEMALE	NONWHITE TOTAL	NONWHITE MALE	NONWHITE FEMALE	CHANGE TOTAL	CHANGE WHITE TOTAL	CHANGE WHITE MALE	CHANGE WHITE FEMALE	CHANGE NONWHITE TOTAL	CHANGE NONWHITE MALE	CHANGE NONWHITE FEMALE
TOTAL	103000	100537	46524	53913	2463	1310	1353	12200	12113	4995	7118	87	35	52
0- 4	4801	4666	2398	2268	135	68	67	97	129	68	61	-32	-16	-16
5- 9	6294	6048	3106	2942	156	79	77	89	89	49	40	0	0	0
10-14	5982	5841	2986	2855	141	57	84	557	534	263	271	23	0	23
15-19	7059	6901	3382	3519	158	78	80	588	612	330	282	-24	1	-25
20-24	5079	4970	2235	2735	109	38	71	-815	-769	-339	-430	-46	-23	-23
25-29	5976	5755	2665	3090	221	95	126	-655	-637	-385	-252	-18	-13	-5
30-34	7708	7485	3454	4031	223	89	134	-313	-265	-172	-93	-48	-23	-25
35-39	8436	8193	3995	4198	243	121	122	591	578	292	286	13	10	3
40-44	9033	8813	4124	4689	220	112	116	1073	1016	400	616	57	24	33
45-49	8252	8083	3892	4191	169	90	79	1813	1740	784	956	73	38	35
50-54	7934	7795	3728	4067	139	64	75	2942	2884	1337	1547	58	23	35
55-59	6343	6264	2985	3279	79	49	30	1853	1842	855	987	11	15	-4
60-64	4812	4729	2169	2560	83	48	35	538	546	230	316	-8	-3	-5
65-69	4258	4157	1824	2333	101	41	60	394	402	139	263	-8	-3	-5
70-74	3852	3757	1498	2259	95	35	60	1013	1014	399	615	-1	1	-2
75-79	3234	3172	1143	2029	62	20	42	1105	1106	397	709	-1	-3	2
80-84	2074	2020	595	1425	54	18	36	646	629	204	425	17	6	11
85+	1965	1898	455	1443	67	8	59	684	663	144	519	21	1	20

PERCENTAGE DISTRIBUTION — PERCENT CHANGE

AGE	TOTAL	WHITE TOTAL	WHITE MALE	WHITE FEMALE	NONWHITE TOTAL	NONWHITE MALE	NONWHITE FEMALE	% CHANGE TOTAL	% CHANGE WHITE TOTAL	% CHANGE WHITE MALE	% CHANGE WHITE FEMALE	% CHANGE NONWHITE TOTAL	% CHANGE NONWHITE MALE	% CHANGE NONWHITE FEMALE
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	13.4	13.7	12.0	15.2	3.7	3.3	4.0
0- 4	4.7	4.6	5.1	4.2	5.5	6.1	5.0	2.1	2.8	2.9	2.8	-19.2	-19.0	-19.3
5- 9	6.0	6.0	6.7	5.5	6.3	7.1	5.7	1.5	1.5	1.6	1.4	0.0	0.0	0.0
10-14	5.8	5.8	6.4	5.3	5.7	5.1	6.2	10.3	10.1	9.7	10.5	19.5	0.0	37.7
15-19	6.9	6.9	7.3	6.5	6.4	7.0	5.9	9.1	9.7	10.8	8.7	-13.2	1.3	-23.8
20-24	4.9	4.9	4.8	5.1	4.4	3.4	5.2	-13.8	-13.4	-13.2	-13.6	-29.7	-37.7	-24.5
25-29	5.8	5.7	5.7	5.7	9.0	8.6	9.3	-9.9	-10.0	-12.6	-7.5	-7.5	-12.0	-3.8
30-34	7.5	7.4	7.4	7.5	9.1	8.0	9.9	-3.9	-3.4	-4.7	-2.3	-17.7	-20.5	-15.7
35-39	8.2	8.1	8.5	7.8	9.9	10.9	9.0	7.5	7.6	7.9	7.3	5.7	9.0	2.5
40-44	8.8	8.8	8.9	8.7	9.3	10.1	8.6	13.5	13.0	10.7	15.1	33.3	27.3	39.8
45-49	8.0	8.0	8.3	7.8	6.9	8.1	5.8	28.2	27.4	25.2	29.6	76.0	73.1	79.5
50-54	7.7	7.8	8.0	7.5	5.6	5.9	5.5	58.9	58.7	55.9	61.4	71.6	56.1	87.5
55-59	6.2	6.2	6.4	6.1	3.2	4.4	2.2	41.3	41.7	40.1	43.1	16.2	44.1	-11.8
60-64	4.7	4.7	4.7	4.7	3.4	4.3	2.6	12.6	13.1	11.9	14.1	-8.8	-5.9	-12.5
65-69	4.1	4.1	3.9	4.3	4.1	3.7	4.4	10.2	10.7	8.2	12.7	-7.3	-6.8	-7.7
70-74	3.7	3.7	3.2	4.2	3.9	3.2	4.4	35.7	37.0	36.3	37.4	-1.0	2.9	-3.2
75-79	3.1	3.2	2.5	3.8	2.5	1.8	3.1	51.9	53.5	53.2	53.7	-1.6	-13.0	5.0
80-84	2.0	2.0	1.3	2.6	2.2	1.6	2.7	45.2	45.2	52.2	42.5	45.9	50.0	44.0
85+	1.9	1.9	1.0	2.7	2.7	0.7	4.4	53.4	53.7	46.3	56.2	45.7	14.3	51.3

NET MIGRATION, JULY 1,1990-JULY 1,2000...WHITE 13209. NONWHITE 98. TOTAL 13307.

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85&OVER
WM	129	973	657	346	-454	-340	921	990	585	345	247	203	169	203	205	224	134	134
WF	121	933	656	626	163	-130	884	883	622	363	127	204	220	280	372	470	412	506
NM	-5	-3	-26	0	-18	20	30	16	4	-14	-15	5	16	17	4	-2	4	-2
NF	-5	-4	1	3	10	22	41	-7	-39	-36	-3	-10	0	32	30	0	1	32

ROANOKE COUNTY

PROJECTED POPULATION BY AGE, COLOR, AND SEX JULY 1, 2005

AGE	TOTAL	WHITE			NONWHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
TOTAL	107000	104512	48095	56417	2488	1116	1372
0- 4	4720	4585	2356	2229	135	68	67
5- 9	6182	6045	3105	2940	137	69	68
10-14	6740	6586	3366	3220	154	76	78
15-19	6963	6826	3345	3481	137	48	89
20-24	5522	5346	2405	2941	176	84	92
25-29	5945	5776	2645	3131	169	57	112
30-34	6690	6485	3046	3439	205	97	108
35-39	8066	7862	3641	4221	204	89	115
40-44	8583	8375	4056	4319	208	108	100
45-49	8971	8767	4108	4659	204	94	110
50-54	8155	8003	3801	4202	152	86	66
55-59	7760	7620	3540	4080	140	70	70
60-64	6148	6048	2758	3290	100	52	48
65-69	4551	4464	1917	2547	87	40	47
70-74	3855	3777	1516	2261	78	30	48
75-79	3253	3181	1133	2048	72	26	46
80-84	2496	2442	797	1645	54	13	41
85+	2400	2324	560	1764	76	9	67
PERCENTAGE DISTRIBUTION							
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0- 4	4.4	4.4	4.9	4.0	5.4	6.1	4.9
5- 9	5.8	5.8	6.5	5.2	5.5	6.2	5.0
10-14	6.3	6.3	7.0	5.7	6.2	6.8	5.7
15-19	6.5	6.5	7.0	6.2	5.5	4.3	6.5
20-24	5.2	5.1	5.0	5.2	7.1	7.5	6.7
25-29	5.6	5.5	5.5	5.5	6.8	5.1	8.2
30-34	6.3	6.2	6.3	6.1	8.2	8.7	7.9
35-39	7.5	7.5	7.6	7.5	8.2	8.0	8.4
40-44	8.0	8.0	8.4	7.7	8.4	9.7	7.3
45-49	8.4	8.4	8.5	8.3	8.2	8.4	8.0
50-54	7.6	7.7	7.9	7.4	6.1	7.7	4.8
55-59	7.3	7.3	7.4	7.2	5.6	6.3	5.1
60-64	5.7	5.8	5.7	5.8	4.0	4.7	3.5
65-69	4.3	4.3	4.0	4.5	3.5	3.6	3.4
70-74	3.6	3.6	3.2	4.0	3.1	2.7	3.5
75-79	3.0	3.0	2.4	3.6	2.9	2.3	3.4
80-84	2.3	2.3	1.7	2.9	2.2	1.2	3.0
85+	2.2	2.2	1.2	3.1	3.1	0.8	4.9

CHANGE IN POPULATION SINCE JULY 1, 2000

TOTAL	WHITE			NONWHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
4000	3975	1471	2504	25	6	19
-81	-81	-42	-39	0	0	0
-22	-3	-1	-2	-19	-10	-9
758	745	380	365	13	19	-6
-96	-75	-37	-38	-21	-30	9
443	376	170	206	67	46	21
-31	21	-20	41	-52	-38	-14
-1018	-1000	-408	-592	-18	8	-26
-360	-321	-344	23	-39	-32	-7
-459	-438	-68	-370	-20	-4	-16
719	684	216	468	35	4	31
221	208	73	135	13	22	-9
1417	1356	555	801	61	21	40
1336	1319	589	730	17	4	13
293	307	93	214	-14	-1	-13
3	20	18	2	-17	-5	-12
19	9	-10	19	10	6	4
422	422	202	220	0	-5	5
435	426	105	321	9	1	8
PERCENT CHANGE						
3.9	4.0	3.2	4.6	1.0	0.5	1.4
-1.7	-1.7	-1.8	-1.7	0.0	0.0	0.0
-0.4	-0.0	-0.0	-0.1	-12.2	-12.7	-11.7
12.7	12.8	12.7	12.8	9.2	33.3	-7.1
-1.4	-1.1	-1.1	-1.1	-13.3	-38.5	11.3
8.7	7.6	7.6	7.5	61.5	121.1	29.6
-0.5	0.4	-0.8	1.3	-23.5	-40.0	-11.1
-13.2	-13.4	-11.8	-14.7	-8.1	9.0	-19.4
-4.3	-3.9	-8.6	0.5	-16.0	-26.4	-5.7
-5.1	-5.0	-1.6	-7.9	-6.8	-3.6	-13.8
8.7	8.5	5.5	11.2	20.7	4.4	39.2
2.8	2.7	2.0	3.3	9.4	34.4	-12.0
22.3	21.6	18.6	24.4	77.2	42.9	133.3
27.8	27.9	27.2	28.5	20.5	8.3	37.1
6.9	7.4	5.1	9.2	-13.9	-2.4	-21.7
0.1	0.5	1.2	0.1	-17.9	-14.3	-20.0
0.6	0.3	-0.9	0.9	16.1	30.0	9.5
20.3	20.9	33.9	15.4	0.0	-27.8	13.9
22.1	22.4	23.1	22.2	13.4	12.5	13.6

Future Growth Pattern Analysis

Roanoke County

1983 - 2003

Purpose

The population of Roanoke County has been projected by the Virginia Department of Planning and Budget to increase from 76,429 persons in 1983 to 105,400 persons by the year 2003. The purpose of the **Future Growth Pattern Analysis** is to specify the location, the intensity, and the timing of the anticipated growth. The results of the **Analysis** will be critical in determining future service demands, in establishing the locations and capacity of community facilities and utilities, and developing effective land use controls.

Analysis

Step 1. Twelve community planning areas were identified within Roanoke County. Each area was defined according to the criteria of topography, availability of utility services, existing land use, and elementary school districts.

Step 2. For each of the two preceding decades, 1963-1973 and 1973-1983, growth ratios and housing unit densities were calculated for each community planning area. Housing unit density was based upon the number of dwelling units per developable square mile. Developable square mile was defined to exclude land in a flood hazard area or land with slopes exceeding 20 percent.

Step 3. A density ceiling model was used to analyze the past growth rates and housing unit densities of each community planning area.[1] Twenty-four

1. Greenberg, Michael R., et al., Local Population and Employment Projection Techniques, (New Brunswick: Center for Urban Policy Research, 1978), p. 18.

points (twelve planning areas x two decades) were plotted logarithmically to determine the historical density patterns that had occurred within the County. From this graph, four density patterns were identified. These patterns were labeled as rural stable, transitional, suburban, and urban. A critical housing unit density was calculated for each of the four patterns (see Figure 2-CC). These densities are as follows:

Density Pattern	Critical Density (Housing Units Per Square Mile) Of Developable Land	Action Required to Surpass Critical Density
Rural/Stable	26	Change Land Use Regulations
Transitional	101	Install Utilities
Suburban	829	Change Land Use Regulations
Urban	3,586	

Source: Roanoke County, Department of Development

Critical housing unit density assumes that as the saturation point is approached, growth slows and eventually stabilizes or declines. When the critical point is eventually reached, additional population growth then spills over to other community planning areas that have not reached a critical density. This overflow will occur unless changes are made to accommodate the growth. Utility extensions or enlargement of existing sewer and water facilities will support intensified development. The amendment of existing land use regulations to allow for more units per acre is another mechanism that will increase critical density.

Step 4. Based on 1983 housing unit densities and committed infrastructure improvements, each community planning area was classified as rural, transitional, suburban, or urban in character. The density ceiling model was applied to

DENSITY CEILING MODEL

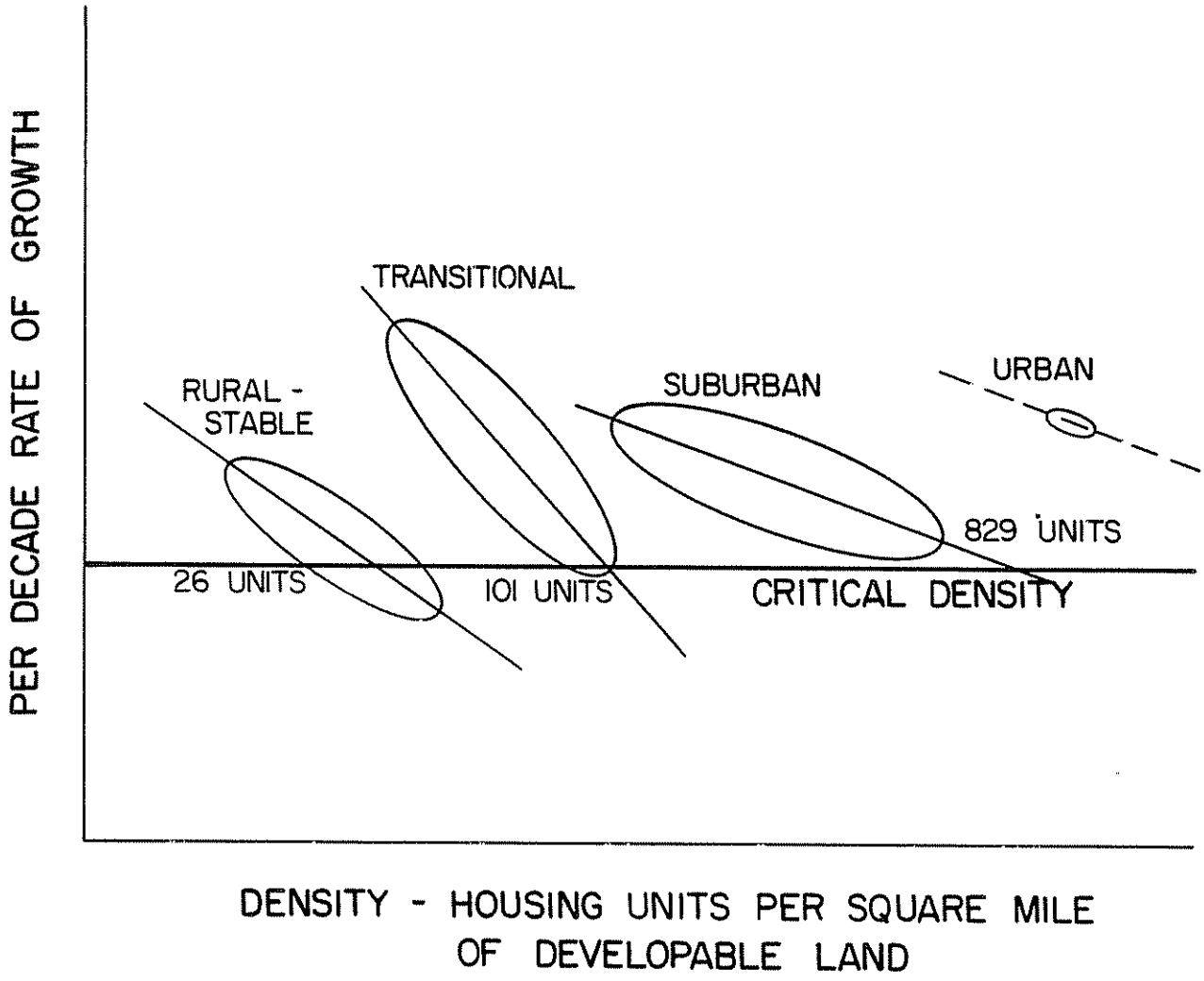

FIGURE 2-CC

each planning area to project housing unit densities for 1993 and the year 2003. The results are as follows:

Housing Units Density (Per Square Mile of Developable Land)

Community Planning Area	1983	Density Pattern	1993	Density Pattern	2003
Back Creek	65.6	Transitional	102.0	Transitional	101.4
Bent Mountain	24.3	Rural	25.4	Rural	25.8
Bonsack	130.0	Suburban	255.4	Suburban	392.3
Catawba	19.4	Rural	23.7	Rural	25.2
Cave Spring	662.1	Suburban	718.7	Suburban	757.1
Clearbrook	76.7	Transitional	101.8	Transitional	101.4
Glenvar	128.4	Transitional	128.4	Suburban	253.4
Mason's Cove	28.8	Rural	28.8	Rural	28.8
Mt. Pleasant	119.3	Transitional	119.3	Transitional	119.3
Peters Creek	450.9	Suburban	563.0	Suburban	648.3
Vinton	340.5	Suburban	417.0	Suburban	578.8
Windsor Hills	587.5	Suburban	666.1	Suburban	721.4

Source: Roanoke County, Department of Development

Results

Population projections for each community planning area were derived from the housing unit density information. The tables, **Growth Distribution 1983-2003, Population Projections - Community Planning Areas**, and Figures 2-D and 2-E describe these results completely.

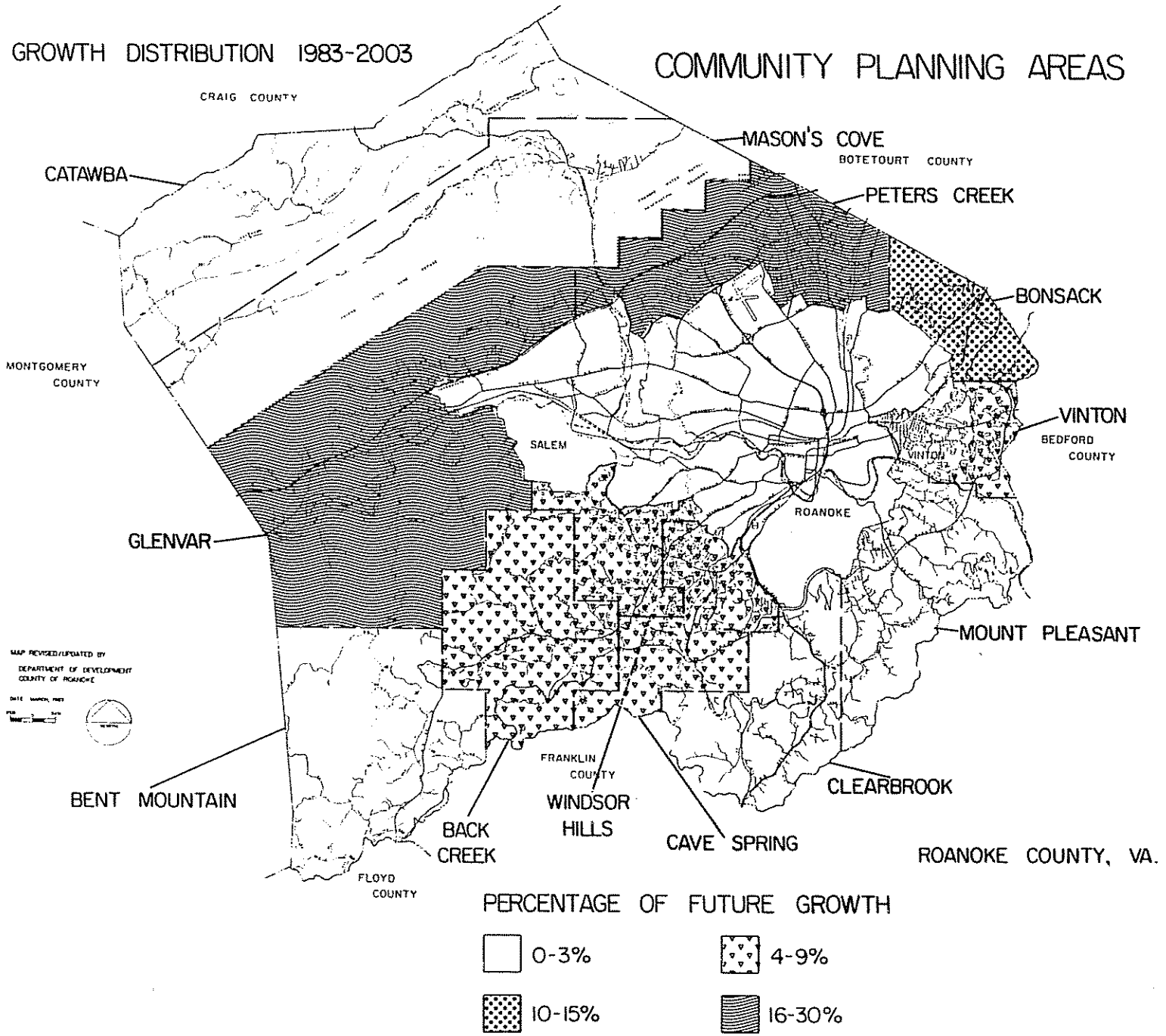
GROWTH DISTRIBUTION 1983-2003
COMMUNITY PLANNING AREAS
CRAIG COUNTY
MASON'S COVE
BOTETOURT COUNTY
CATAWBA
PETERS CREEK
BONSACK
MONTGOMERY COUNTY
VINTON
BEDFORD COUNTY
SALEM
VINTON
ROANOKE
GLENVAR
MOUNT PLEASANT
MAP REVISED/UPDATED BY
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
FRANKLIN COUNTY
CLEARBROOK
BENT MOUNTAIN
BACK CREEK
WINDSOR HILLS
CAVE SPRING
ROANOKE COUNTY, VA.
FLOYD COUNTY
PERCENTAGE OF FUTURE GROWTH
0-3%
4-9%
10-15%
16-30%

FIGURE 2-D

Growth Distribution - Roanoke County

1983 -2003

	Percent of Total County Growth	
Community Planning Area	1983-1993	1983-2003
Back Creek	8.52	3.69
Bent Mountain	.32	.18
Bonsack	14.73	13.56
Catawba	2.45	1.46
Cave Spring	10.63	7.85
Clearbrook	4.28	1.86
Glenvar	-.0-	25.60
Mason's Cove	-.0-	-.0-
Mt. Pleasant	-.0-	-.0-
Peters Creek	37.06	28.74
Vinton	10.04	8.07
Windsor Hills	11.97	8.98
Total County[1]	100.0	100.0

1. Does not include the Town of Vinton

Source: Roanoke County, Department of Development

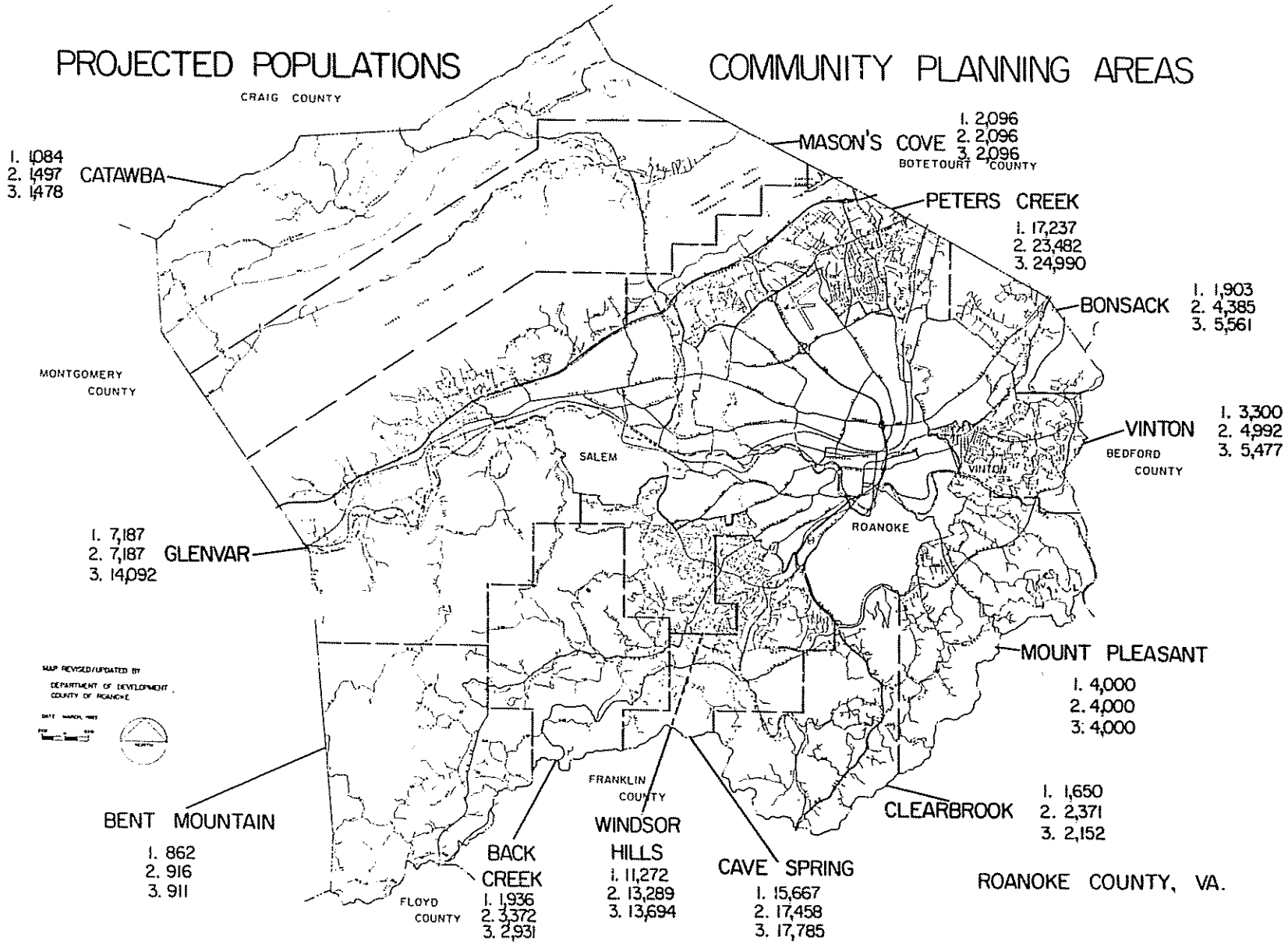
PROJECTED POPULATIONS
COMMUNITY PLANNING AREAS
CRAIG COUNTY
1. 1084
2. 1497
3. 1478
CATAWBA
1. 2,096
2. 2,096
3. 2,096
MASON'S COVE
BOTETOURT COUNTY
PETERS CREEK
1. 17,237
2. 23,482
3. 24,990
BONSACK
1. 1,903
2. 4,385
3. 5,561
MONTGOMERY COUNTY
SALEM
VINTON
1. 3,300
2. 4,992
3. 5,477
BEDFORD COUNTY
ROANOKE
1. 7,187
2. 7,187
3. 14,092
GLENVAR
MAP REVISED/UPDATED BY
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
MOUNT PLEASANT
1. 4,000
2. 4,000
3. 4,000
FRANKLIN COUNTY
CLEARBROOK
1. 1,650
2. 2,371
3. 2,152
BENT MOUNTAIN
1. 862
2. 916
3. 911
BACK CREEK
1. 1,936
2. 3,372
3. 2,931
FLOYD COUNTY
WINDSOR HILLS
1. 11,272
2. 13,289
3. 13,694
CAVE SPRING
1. 15,667
2. 17,458
3. 17,785
ROANOKE COUNTY, VA.
NOTE :
1. 1983 POPULATION
2. 1993 PROJECTED POPULATION
3. 2003 PROJECTED POPULATION

FIGURE 2-E

Population Projections - Community Planning Areas

1983 - 2003

Community Planning Area	1983[1]	1988	1993	1998	2003	% Change 1983-2003
Back Creek	1,936	2,654	3,372	3,152	2,931	51
Bent Mountain	862	889	916	914	911	6
Bonsack	1,903	3,144	4,385	4,973	5,561	192
Catawba	1,084	1,291	1,497	1,488	1,478	36
Cave Spring	15,667	16,563	17,458	17,622	17,785	14
Clearbrook	1,650	2,011	2,371	2,262	2,152	30
Glenvar	7,187	7,187	7,187	10,640	14,092	96
Mason's Cove	2,096	2,096	2,096	2,096	2,096	0
Mt. Pleasant	4,000	4,000	4,000	4,000	4,000	0
Peters Creek	17,237	20,360	23,482	24,236	24,990	45
Vinton	3,330	4,416	4,992	5,235	5,477	66
Windsor Hills	11,272	12,281	13,289	13,492	13,694	21
Total Planning Area Population	68,194	76,622	85,045	90,110	95,167	40.0
Town of Vinton	8,086	8,783	9,467	9,896	10,233	26.6
Total County	76,280	85,405	94,512	100,006	105,400	38.2

1. 1983 population as of June 1, 1983

Source: Roanoke County, Department of Development
Town of Vinton

CHAPTER 3

ECONOMIC ANALYSIS

ECONOMIC ANALYSIS

Introduction

An urban economy is a system of production, distribution, and consumption which includes all the productive activity within an urban center and that part of the hinterland which is dependent to a marked degree on facilities and services available within the center.[1] The cities of Roanoke and Salem and the urbanized portions of Roanoke County are located at the center of an urban economic system that also includes the counties of Botetourt and Craig, as well as the rural portions of Roanoke County. This economic system, the Roanoke Standard Metropolitan Statistical Area (SMSA), is by definition a demographic and economic unit which, as determined by the U.S. Office of Information and Regulatory Affairs (IORA), includes the aforementioned jurisdictions and the Town of Vinton.[2] These six localities are also recognized by the Virginia Employment Commission as a single labor market area with an office in the City of Roanoke serving the entire area.

Purpose

The economic component of the Comprehensive Development Plan will examine current manufacturing, commercial, tourist, and agricultural activities; labor force resources, income characteristics; and potential economic trends which characterize or are expected to characterize the Roanoke SMSA, and specifically Roanoke County.

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1. F. Stuart Chapin, Urban Land Use Planning, p.108.

2. For explanation of SMSA, refer to Chapter 2, Population Analysis.

Commuting Patterns

In 1980, 85.8 percent of all workers sixteen years of age and over living in the Roanoke SMSA were also employed within the SMSA. Of the remaining 14.2 percent, 4.6 percent or 4,614 workers reported employment outside of the SMSA, while 9.6 percent did not correctly report a place of employment or did not report employment at the county level.

Commuting Patterns - Roanoke SMSA

Workers 16 Years and Over by Place of Work

	Roanoke[1] County	Botetourt County	Craig County	Roanoke City	Salem City	Roanoke SMSA
Workers Employed in SMSA						
Roanoke City	17,193	3,268	281	27,308	3,669	51,719
Remainder of SMSA	12,597	4,954	1,063	9,239	6,237	34,090
Total SMSA	29,790	8,222	1,344	36,547	9,906	85,809
Workers Employed Outside of SMSA	1,346	1,253	289	1,094	632	4,614
Not Reported	3,180	733	18	5,031	613	9,575
TOTAL	34,316	10,208	1,651	42,672	11,151	99,998

Almost 95 percent of all workers sixteen years of age and over living in the Roanoke SMSA who correctly reported a place of employment were employed by firms located within the Roanoke SMSA.

In 1980, 85,809 persons worked within the SMSA and of these 60.3 percent or 51,719 worked within the City of Roanoke. Most of these individuals

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1. For further description of Roanoke County Commuting Patterns, see Appendix A.

lived in either the City or County of Roanoke. Approximately one-third of the employed residents of Salem and Botetourt County worked in Roanoke City in 1980.

These data substantiate the contention that the geographic community, the local clustering of economically self-sufficient persons within an identifiable, cohesive area (city, county, town) sharing values, interactions, and institutions no longer has as much validity as it once did. The overlapping of municipal and other governmental units heightened by the impact of an industrial society has diminished self-sufficiency and encouraged the growth of economic systems. For the purposes of an economic analysis, community boundaries are more difficult to delineate and of less consequence because, as in the Roanoke SMSA, people tend to travel to different geographic areas to work, to shop, and to use community facilities and services.

Economic Activities

There are essentially two types of economic activity - basic activities which produce and distribute goods and services for export to firms and individuals outside a defined localized economic area (which for the purposes of this analysis coincides with the Roanoke SMSA) and non-basic or support activities whose goods and services are consumed within the localized area. Basic activities bring in "new money" while support endeavors essentially recycle money already in the community. Basic industry is the cornerstone of an area's economic vitality. Money derived from exportation is necessary for the expansion of existing basic activities which in turn promote increased support activities. Increased basic activity encourages the creation of new jobs, enhances the standard of living of those persons already employed, and provides the impetus for increased economic growth.

levels, to meet the demands of either positive or negative growth, and the capacity to resist local and regional economic disruptions. A balanced economic base that is not as vulnerable to sudden downturns in the economic cycles of the nation or the state is critical for maintaining a desired financial condition by assuring the continued generation of revenues and employment.

Evaluating Basic and Supporting Economic Activities

Generally, manufacturing activities comprise the basic sector since the products of these endeavors are exported beyond the boundaries of the urban economic system. Similarly, local retail and service businesses are usually the foundation of the support sector. Quantification of basic and supporting activities, the comparison of local, state and national employment within a specific industrial category, is accomplished by way of the Location Quotient (LQ) Analysis. A location quotient equal to 1.00 indicates that within a specific industrial category, employment within a local labor market area is proportionate to that of the nation or the state. An LQ of 1.00 implies that only enough goods or services are produced to satisfy local consumer needs. An LQ significantly less than 1.00 suggests that imports must be secured to meet local demands for the specific goods or services involved. An LQ much greater than 1.00 signifies that goods and services are exported to other trade areas.

Although the LQ technique is not foolproof, it does give a good indication of those industries which provide the foundation for the economies of Roanoke County and the Roanoke SMSA. The results of the LQ analysis are described by the tables, **Location Quotient Analysis - 1982.**

Location Quotient Analysis - 1982

Roanoke County

Industrial Group	Employment % Roanoke County	Employment % National	Location Quotient	Employment % - State	Location Quotient
Goods Producing	29.3	26.7	1.10	24.4	1.20
Mining	.4	1.3	.30	1.0	.4
Construction	10.0	4.4	2.27	4.9	2.04
Manufacturing	18.9	21.0	.90	18.5	1.02
Services Producing	70.7	73.3	.96	75.6	.94
Transportation & Public Utilities	4.4	5.6	.79	5.4	.81
Trade	27.8	22.9	1.21	22.0	1.26
Finance, Insurance, & Real Estate	8.3	6.0	1.38	4.9	1.69
Services and Government	30.2	38.8	.78	43.3	.69

Source: Virginia Employment Commission
U.S. Department of Labor - Bureau of Labor Statistics

Location Quotient Analysis - 1982

Roanoke SMSA

Industrial Group	Employment % Roanoke County	Employment % National	Location Quotient	Employment % - State	Location Quotient
Goods Producing	24.1	26.7	.90	24.4	.99
Mining	.2	1.3	.15	1.0	.20
Construction	4.2	4.4	.95	4.9	.86
Manufacturing	19.7	21.0	.94	18.5	1.06
Services Producing	75.9	73.3	1.04	75.6	1.00
Transportation & Public Utilities	9.6	5.6	1.71	5.4	1.78
Trade	25.0	22.9	1.09	22.0	1.14
Finance, Insurance, & Real Estate	5.9	6.0	.98	4.9	1.20
Services and Government	35.4	38.8	.91	43.3	.82

Source: Virginia Employment Commission
U.S. Department of Labor - Bureau of Labor Statistics

From these data, it is obvious that the service sector activity dominates Roanoke County, the State, and the Nation. However, a lower percentage of employed persons work within the service sector in the County than in either the National or the SMSA. The percentage of service sector employment within the State and the Roanoke SMSA is essentially equivalent. The percentage of persons employed in Roanoke County within the goods producing/export sector (manufacturing, construction, mining) exceeds the respective percentages for the Nation, State, and SMSA. The location quotients described by the respective tables reflect these comparisons.

Consumer Price Index and Constant Dollars

The CPI for all urban consumers represents approximately 80 percent of the urban population and includes urban wage earners, clerical workers, the self-employed, professional and other salaried workers, retirees, the unemployed, and others not in the labor force. The consumer price index is a measure of prices paid for a "market basket" of goods purchased by a typical urban household.

As a measure of inflation, the CPI is used to convert the value of current dollars to the value of constant dollars. When evaluating economic fluctuations, it is often necessary to consider the impacts of inflation. The constant dollar factors listed below must be considered when evaluating the changes associated with economic activity, labor force resources, and income characteristics.

Consumer Price Index for All Urban Consumers

January 1st	CPI Index (1)	% Change Yearly Avg.	Factor to Convert to Constant 1983 Dollars (2)
1978	187.2	7.7	1.565
1979	204.7	11.3	1.431
1980	233.2	13.5	1.256
1981	260.5	10.4	1.125
1982	282.5	6.1	1.037
1983	293.1	—	1.0

1. Source: U.S. Department of Labor, Bureau of Labor Statistics
2. Calculations by Roanoke County, Department of Development

Manufacturing

Manufacturing is a very important part of the Roanoke County economy. Roanoke City has traditionally been the manufacturing center of the area; however, the number of firms located in the County has steadily increased. The major manufacturing concerns operating within the Roanoke County-Roanoke-Salem area are as follows:

Manufacturing Firms

Legend

A = 5 - 19 Employees
B = 20 - 49 Employees
C = 50 - 99 Employees
D = 100 - 299 Employees
E = 300 - 599 Employees
F = 600 - 999 Employees
G - 1,000 or More Employees
N/A = Unavailable

Firm	Product or Process	Employment Category
Roanoke County		
Apple Pie	Plaques	N/A
AMP, Inc.	Electrical Products	D
Attco, Inc.	Trucks, Tractors, Trailers	B
Better Packaging, Inc.	Paper	A
Burlington Industries	Fabrics	E
Classic Cabinets, Inc.	Cabinets	A
Corrugated Container Corp.	Boxes and Packing	C
D&M Concrete Specialties, Inc.	Manholes, Drop Inlets	A
Dixie Letter Service	Printing	A
Double Envelope Corp.	Envelopes	E
Dragon Chemical Corp.	Chemicals	B
Fabricated Metal, Inc.	Ornamental Metal Work	B
Frey Company, Inc.	Lime and Stone	C
GCC Beverages, Inc.	Soft Drinks	D
John Hancock, Inc.	Joists and Girders	D

Firm	Product or Process	Employment Category
Roanoke County Continued		
ITT Electro-Optical Products Division	Fiber Optics, Night Vision Prod.	F
Industrial Fabricators, Inc.	Conveyors, Street Prods.	B
Ingersoll-Rand Company	Air Powered Equipment & Tools	E
Keltech, Inc.	Electronic Controls	A
Koppers Company, Inc.	Cross Ties	B
Kormann, Inc.	Framed Pictures	B
Kroger Company	Food Products	E
Legard Petroleum Company, Inc.	Petroleum Well Drilling	N/A
Leisure Publishing	Periodicals	N/A
Medeco Security Locks, Inc.	Locks and Plates	E
Medusa Aggregates Company	Stone	A
Murray's Cider	Apple Cider	B
Nord Instrument Company, Inc.	Industrial Control Systems	A
Perdue Cabinet Shop, Inc.	Cabinets	A
Phillips Ornamental Iron, Inc.	Iron Rails	N/A
Phoenix Concrete Products, Inc.	Precast Concrete	B
Plastic Products, Inc.	Custom Molding, Cords, Biological Implants	B
Purex Corporation	Bleaches, Ammonia	A
Red Rose Country Store	Feeds	A
Roanoke Foundry, Inc.	Iron, Brass, Aluminum Castings	A
Ryan Iron Works & Erectors	Steel Erection, Iron	A
Salem Frame Company, Inc.	Furniture, Frames	E
Semco Manufacturing, Inc.	A.C. Ducts & Pipe, Sound Attenuators	C
Southern States Cooperative, Inc.	Feed	B

Firm	Product or Process	Employment Category
Roanoke County Continued		
Stone Printing Company, Inc.	Commercial Printing	C
H.G. Stover	Custom Made Jewelry	A
Superior Cabinet Company	Cabinets	A
Valley Trading Post, Inc.	Classified Advertising	A
Vinton Messenger	Newspaper	A

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Roanoke City		
ANR Coal Company	Bituminous Coal	D
Adams Construction Company	Asphalt, Limestone	E
Allied Tool and Machine Company.	Steel Cabinets, Heaters	B
All-Steel Fabricators, Inc.	Structural Steel	A
American Lithoplate	Plates, Typesetting	A
American Packaging Corp.	Corrugated Boxes	A
Aquatera	Waterproof and Float Bags	A
Art Printing Company	Commercial Printing	A
Atlantic Concrete, Inc.	Ready Mix Concrete	N/A
Automated Materials, Inc.	Conveyors & Material Handling	B
Automotive Machine Shop, Inc.	Machine Shop	A
Bentley & Simon, Inc.	Clothing	D
Blue Ridge Optical Company, Inc.	Eyeglasses & Lenses	B
Blue Ridge Steel Company	Fabricated Metals	N/A
Blue Stone Block, Inc.	Masonry Units	A
Bright-Crest, LTD	Paperboard Products	C
CHD Industries	Hospital Admission Kits	D
Carlen Controls, Inc.	Industrial Controls and Sensors	A

Firm	Product or Process	Employment Category
Carter's Cabinet Shop, Inc.	Cabinets	A
Claire Manufacturing Company, Inc.	Clothing	C
Collegiate Pacific	Clothing and Banners	D
Colonial Ice Company	Ice	N/A
Creative Displays, Inc.	Signs and Advertising Displays	A
Custom Craft Homes, Inc.	Custom Homes	A
Custom Wood Products, Inc.	Cabinets, Countertops	C
Dominion Signs, Inc.	Signs, Advertising Displays	A
Double-Cola Beverage Corp.	Soft Drinks	N/A
Eli Lilly & Company, Inc.	Cosmetics	F
Engineered Products, Inc.	Conveyors, Bins	B
Evans Products Company	Paint	D
Freeway Corp.	Metal Washers	N/A
Genesis Publishing, Inc.	Publishing	A
Granite Memorials, Inc.	Cemetery Memorials	A
Gruman Emergency Products, Inc.	Fire Trucks	E
Gurtner Graphics	Printing, Graphics	B
Halmode Apparel, Inc.	Clothing	E
Hammond Business Forms	Forms	D
Hansteck Corp.	Paint Rollers	A
Harris Hardwood Company, Inc.	Hardwood Flooring	C
Hickory Springs Manufacturing Company	Beds and Bedding	B
Hodges Lumber Corporation	Millwork	C
Hodges Sign Company	Neon & Plastic Signs	N/A
Home Center, Inc.	Countertops	A
Home Lumber Corp.	Millwork	A
Hub Pattern Corp.	Patterns and Molds	B
Interstate Equipment Corp.	Heavy Equipment	B
Jamont Press, Inc.	Printing	B
Johnson Foods	Prepared Sandwiches	C

Firm	Product or Process	Employment Category
Roanoke City Continued		
Kelley Burial Vaults	Burial Vaults	A
Kidd Printing Company, Inc.	Printing	A
Kinsey Sign Company	Signs	A
Kraft, Inc.	Milk Processing	C
Kroger Company	Baked Goods	D
Lady Bird Apparel, Inc.	Clothing	D
Lightweight Block Company, Inc.	Masonry	B
Lloyd Electric Company, Inc.	Machine Shop	B
Loebl Dyers & Cleaners	Dyeing Textiles	A
Longbranch Coal Company	Coal Mining	C
MPS Corp.	Metal Work	B
Maier Printing Company	Commercial Printing	A
Marsteller Corp.	Monuments	B
Michael's Bakery Corp.	Baked Goods	A
Miller Container Corp.	Corrugated Boxes	D
Miscellaneous Concrete Products	Concrete Products	N/A
Norfolk & Western Company	Railroad Equipment	G
Oak Hall Cap & Gown Company, Inc.	Clothing	C
Professional Ophthalmic Lab, Inc.	Eye Glasses	B
Progress Press, Inc.	Commercial Printing	B
Quality Manufacturing Company, Inc.	Electronic Control Panels	N/A
Rainbo Bread Company, Inc.	Bread	D
Reliance Universal, Inc.	Finishing Materials	D
Roanoke Apple Products Co.	Vinegar, Apple Sauce	B
Roanoke Belt & Rubber Company, Inc.	Materials Handling Systems	C

Firm	Product or Process	Employment Category
Roanoke City Continued		
Roanoke Box, Inc.	Folding Paper Boxes	C
Roanoke City Mills, Inc.	Feed	C
Roanoke Concrete Products, Inc.	Concrete Pipe	B
Roanoke Dress Corp.	Dresses	B
Roanoke Electric Steel Corp.	Steel Products	F
Roanoke Engraving Company	Separation, Photoprints	B
Roanoke Fashions Company	Clothing	C
Roanoke Ice & Cold Storage Company	Ice	B
Roanoke Iron & Bridge Works, Inc.	Structural Metal	N/A
Roanoke Nehi Bottling Corp.	Soft Drinks	B
Roanoke Orthopedic Appliance, Inc.	Orthopedic Appliances	A
Roanoke Printing Co.,Inc.	Commercial Printing	A
Roanoke Stamp and Seal Company, Inc.	Stamps and Signs	B
Roanoke Times & World News	Newspaper	E
Roanoke Tribune	Newspaper	A
Roanoke Welding Company	Machine Work	N/A
Rusco Window of Roanoke, Inc.	Windows and Doors	D
Seven-Up Bottling Company	Soft Drinks	B
Shenandoah Ice Company	Ice	N/A
Shimchock's Litho Services, Inc.	Labels, Forms	A
Singer Furniture	Furniture	E
South Roanoke Lumber Company	Millwork	B
Stanford & Inge	Signs	C
Structural Steel Company, Inc.	Steel Fabrication	C

Firm	Product or Process	Employment Category
Roanoke City Continued		
Stultz Machine & Manufacturing Company	Machine Shop	A
Sunnyside Awning & Tent Company, Inc.	Canvas Awnings	A
Tele-Path Industries, Inc.	Telephone Enhancement	D
Thompson Engineering, Inc.	Hydrostatic Drives	A
Thoroughblend, Inc.	Animal Vitamins	N/A
Tip N' Twinkle, Inc.	Plaques, Medallions	A
Toler & Company	Printing	A
Toltec Fiberglass, Inc.	Panels, Ductwork, Tanks, Molds	A
Tread Corporation	Security Chests	D
Union Carbide Corp.	Oxygen, Nitrogen, Argon	A
United Iron and Metal Company, Inc.	Scrap Metal Processors	B
Valcom, Inc.	Telephone Systems	C
Valley Corporation	Typesetting	N/A
Valley Lumber Corp.	Trusses and Cabinets	B
Valley Machine & Maintenance	Machine Repair	A
Valley Trading Post, Inc.	Newspaper Advertising	A
Vinton Messenger	Newspaper	A
Virginia Awning & Window	Windows and Awnings	A
Virginia Fiberglass Products, Inc.	Portable Buildings, Toilets	C
Virginia Foundry Company, Inc.	Castings	B
Virginia Metal Manufacturing Company, Inc.	Metal Pipe and Drains	A
Virginia Plastics Company	Insulated Wire and Cable, Cords	B
Virginia Printing Company	Commercial Printing	A
Virginia Prosthetics, Inc.	Prosthetic Appliances	A
Virginia Stove Works, Inc.	Wood Burning Stoves	B
Webster Brick Company, Inc.	Brick	E

Firm	Product or Process	Employment Category
Roanoke City Continued		
Wen-Don Chemical Company, Inc.	Chemicals	C
Whitaker Company	Carpet Yarns	E
White Foundry Company, Inc.	Castings	B
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Salem City		
Acme Printing Company	Commercial Printing	A
Agricultural Processing Corp.	Animal Feeds	A
Biochemical Corp. of America	Bacteria Cultures & Enzymes	A
CDG Products Corp.	Potato Chips, Corn Products	D
Capco	Paper Rewinding Machines	A
Capital Tool & Manufacturing Company, Inc.	Grinders, Rewinders, Ink Fountains	B
Cooper Industries, Inc.	Construction and Drilling Equipment	D
Damon Company of Salem, Inc.	Machinery, Tools & Dyes	A
Dooley Printing Corp.	Commercial Printing	N/A
Dunn Brothers - Fisher Stoves	Wood Stoves	D
Eaton Corp.	Industrial Forklifts	E
General Electric Company	Control & Power Conversions Industrial Control Components	G
Graham-White Manufacturing Company, Inc.	Pneumatic Devices, Foundry	D
Imperial Elevator Company, Inc.	Elevators, Jacks	A
Jeffreys & Company, Inc.	Fermentation Products	A
Key Brothers Manufacturing Company	Patterns, Cabinets, Cross Ties	A

Firm	Product or Process	Employment Category
Salem City Continued		
L.G. Apparel, Inc.	Clothing	C
Lakeside Vault Company	Burial Vaults	A
Lebanon Apparel Corp.	Clothing	N/A
Lectra Casting Corp.	Foundry Products	A
M&S Machine Shop, Inc.	Machine Shop	A
Maid Bess Corp.	Clothing	N/A
Mason Mechanical Labs, Inc.	Power Converters	A
Mechanical Development Company, Inc.	Tools, Dyes, Machine Parts	C
Mohawk Rubber Company	Tires	E
Old Virginia Brick Co., Inc.	Brick & Tile	C
Roberts Welding & Iron Works	Ornamental Railings	A
Rowe Furniture Corp.	Furniture	D
Salem Concrete Products, Inc.	Concrete Products	B
Salem Printing Company, Inc.	Commercial Printing	A
Salem Ready-Mix Concrete, Inc.	Concrete	A
Salem Specialties, Inc.	Machined Parts	B
Salem Times-Register	Newspaper	B
Shenandoah Industrial Rubber Company	Industrial Rubber Products	A
Timber Truss Housing Systems, Inc.	Building Supplies	N/A
Tom's Foods	Potato Chips	N/A
Valley Steel Corp.	Structural Metal	B
Valleydale Packers, Inc.	Meat Products	D

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Source: Virginia State Chamber of Commerce, 1982
Virginia Division of Industrial Development, 1983

Manufacturing Production

In 1981, total manufacturing shipments from plants located in Roanoke County and the cities of Roanoke and Salem comprised almost 5 percent of the state total. The Roanoke area ranked fourth in the dollar value of goods shipped behind Richmond-Henrico County, Norfolk, and Newport News.

Producers of wood furniture and industrial controls were the dominant manufacturers in the Roanoke area. Industrial control production accounted for more than 5 percent of national output in that category, while furniture manufacturers contributed over 1 percent to national furniture production. The **Manufacturing Production - Roanoke County, Roanoke City, Salem** table summarizes these data for the years 1980, 1981 and 1982.

Manufacturing Production
Roanoke County, Roanoke City, Salem

Producers	# of Plants w/20 or more Employees	Total Shipments ($ Millions)	% of US Shipment
1982			
All Manufacturers	136	1,690.5	.0913
SIC 2511-Wood Furniture	2	54.0	1.09
SIC 26ZZ-Industrial Controls	1	195.6	5.10
1981			
All Manufacturers	140	1,683.9	.0874
SIC 2511-Wood Furniture	2	54.5	1.06
SIC 3622-Industrial Control	1	180.9	5.21
1980			
All Manufacturers	116	1,349.2	.0781
SIC 2511-Wood Furnitures	2	49.3	1.05
SIC 3622-Industrial Controls	1	169.4	5.32

Source: Virginia State Chamber of Commerce
Survey of Industrial Purchasing Power - 1980, 1981, 1982
Sales and Marketing Management.

Manufacturing production in Roanoke County and the cities of Roanoke and Salem increased almost 25 percent between 1980 and 1981. It is estimated, however, that manufacturing output increased less than 1 percent between 1981 and 1982. The annual rates of inflation of 1981 and 1982 were 13.5 percent and 10.4 percent, respectively. Accounting for inflation, the constant dollar value of production in the study areas increased 11.5 percent between 1980 and 1981, but declined 10 percent between 1981 and 1982. These trends correspond generally with the employment statistics presented later in this section.

Retail Sales

Total retail sales in the Roanoke SMSA increased 18.4 percent between 1978 and 1982. Roanoke County experienced the largest percentage increase in retail sales, 46.3 percent, as well as the greatest increase in sales receipts, $84.9 million. The County's percentage share of retail sales in the SMSA increased from 19.3 percent in 1978 to 23.9 percent in 1982. Conversely, Roanoke City's percentage share of retail sales in the SMSA declined from 61.6 percent in 1978 to 58.6 percent in 1982. Food sales comprised 42 percent and 32 percent of the 1982 total taxable retail sales in the County and the SMSA respectively. General merchandise sales contributed 13.5 percent and 16.7 percent to the 1982 total retail sales of the County and the SMSA, respectively. The following tables, **Area Retail Sales, Share of SMSA Retail Sales**, and **Registered Dealers and Total Retail Sales-1982**, describe these trends more fully.

Area Retail Sales
1977-1982
(In $ Millions)

	1978	1979	1980	1981	1982	1978 - 1982 # Chg	1978 - 1982 % Chg
Roanoke Co.	183.5	209.0	245.3	276.4	268.4	84.9	46.3
Roanoke City	584.2	608.5	628.4	624.8	658.4	74.2	12.7
Salem City	146.3	164.6	155.0	155.4	154.1	7.8	5.3
Botetourt Co.	31.5	33.3	37.2	37.3	38.0	6.5	20.6
Craig County	3.1	3.4	4.0	4.2	4.5	1.4	45.2
Roanoke SMSA	948.6	1,018.0	1,069.9	1,098.1	1,123.4	174.8	18.4

Source: Virginia Department of Taxation

Share of SMSA Retail Sales
1978-1982
(Percent)

	1978	1979	1980	1981	1982
Roanoke County	19.3	20.5	22.9	25.2	23.9
Roanoke City	61.6	59.7	58.7	56.9	58.6
Salem City	15.4	16.2	14.5	14.2	13.7
Botetourt County	3.3	3.3	3.5	3.4	3.4
Craig County	.3	.3	.4	.4	.4
Roanoke SMSA[1]	100.0	100.0	100.0	100.0	100.0

1. Totals may reflect rounding
Source: Virginia Department of Taxation

Number of Registered Dealers and Total Retail Sales, 1982 (In Thousands)

Roanoke County

Category	Number of Dealers	Taxable Sales	% of Total Sales
Apparel	65	$ 26,462.8	9.9
Automotive	115	6,611.8	2.5
Food	262	112,911.8	42.1
Furniture	99	15,729.3	5.9
General Merchandise	93	36,144.8	13.5
Lumber and Building	56	13,875.0	4.9
Fuel	7	2,044.2	.8
Machinery	85	11,012.3	4.1
Hotels & Motels	16	10,198.1	3.8
Miscellaneous	568	34,169.9	12.7
Total[1]	1,366	$268,359.4	100.0

Roanoke SMSA

Apparel	216	$ 64,099.0	5.7
Automotive	582	70,414.1	6.3
Food	1,027	361,231.7	32.2
Furniture	372	84,758.1	7.5
General Merchandise	367	188,125.8	16.7
Lumber and Building	262	95,183.6	8.5
Fuel	39	15,087.9	1.3
Machinery	335	51,092.5	4.6
Hotels & Motels	61	29,683.0	2.6
Miscellaneous	1,940	163,810.4	14.6
Total[1]	5,201	$1,123,486.2	100.0

1. Totals may reflect rounding
Source: Virginia Department of Taxation

Projected Retail Sales

Retail sales in Roanoke County are projected to increase from $268 million to $427 million, or 59.1 percent between 1982 and 1987. Retail sales within the Roanoke SMSA are projected to increase 33.8 percent during the study period. The following table describes these projections.

Area Retail Sales
(In $ Millions)

	Current 1982	Projected 1987	% Increase
Roanoke County	268.4	427.0	59.1
Roanoke City	658.4	836.0	27.0
Salem City	154.1	180.4	17.1
Botetourt County	38.0	52.6	38.4
Craig County	4.5	7.5	66.7
Roanoke SMSA	1,123.4	1,503.5	33.8

Source: Virginia Department of Taxation
Projections by Roanoke County, Department of Development

Tourism

Tourism has always been a very important component of Virginia's economy. In 1982, travelers spent $3.3 billion in the State. Of this amount, $2.0 billion was spent by Virginians traveling to other Virginia destinations, and an additional $667 million was spent by State residents traveling to out-of-state destinations. Spending by travelers in 1982 produced $164 million in State and local taxes. Travel spending represented 15 percent of Virginia's 1982 retail business. Travel spending generated 80,300 jobs for Virginians in 1982.

The Roanoke SMSA, and specifically Roanoke County, have recognized the significance of tourism and have made progress in securing their portions of the tourist trade. Activities in downtown Roanoke, cultural attractions, historical landmarks, and natural features combined with a good highway system, ample lodging (3,100 rooms in the cities of Roanoke and Salem and Roanoke County), meeting and convention facilities, and an active retail commercial sector have made Roanoke County a desirable destination for visitors.

The table, **Tourism 1982 and 1981**, summarizes expenditures by travelers in Roanoke County and the Roanoke SMSA in 1982 and 1981 and the wage and salary income, employment, and tax revenue derived from these expenditures.

Tourism 1982 and 1981

	Year	Roanoke County	Roanoke SMSA
Total Travel Expenditures ($000)	1982	35,222	109,578
	1981	27,521	94,985
Travel Generated Payroll ($000)	1982	6,956	21,876
	1981	5,473	19,082
Travel Generated Employment (Jobs)	1982	1,006	2,998
	1981	830	2,725
Local Tax Receipts ($000)	1982	421	1,402
	1981	325	1,197

Source: U.S. Travel Data Center, 1983

Agriculture

The primary agricultural products in Roanoke County are poultry, fruits, dairy goods, beef cattle, and nursery crops. The total market value of agricultural products in the County sold in 1978 was $9.6 million. In 1978, Roanoke County was the seventh leading poultry producing county in Virginia. Poultry production accounted for 67 percent of the total agricultural sales

that year. Fruit production accounted for 4 percent of sales while dairying and beef cattle contributed 5 and 11 percent, respectively. It is significant to note that in 1978 only 6,000 cattle and milk cows were raised within the County; however, this figure increased by 13 percent to 8,600 in 1982.

The number of farms operating within the County declined from 348 in 1969 to 283 in 1978. The total acreage in farm use declined 23.5 percent between 1969 and 1978. Total crop land declined 39 percent from 23,236 acres in 1969 to 14,210 acres in 1978. The acreage of actual harvested crop land, however, declined only 11 percent during the study period. The acreage of total woodland, which comprised 4.4 percent of the total acreage in farm use in 1978, declined less than 3 percent between 1969 and 1978. The acreage of orchards declined almost 71 percent from 1,283 acres in 1969 to only 373 acres in 1982. Planted acreages of grain crops such as corn, barley, and wheat declined less than 2 percent from 1969 to 1981.

Although agricultural acreages are declining within Roanoke County, it appears that most of the decrease has resulted from the conversion or abandonment of peripheral pasture, storage, and orchard lands. The total acreage of harvested crop lands, and specifically grain crops, has remained relatively stable. These crop lands are located almost exclusively in the rural portions of the County and are not served by either sewer or water facilities. The following tables document these trends. (Note: The Agricultural Profile contained within Volume 3 of the Comprehensive Plan describes these trends in much greater detail.)

ROANOKE COUNTY

FARMS AND VALUE OF LANDS AND BUILDINGS

1969, 1974 and 1978

	Total Farms			Farms with Sales of $2,500 or More		
	1969	1974	1978	1969	1974	1978
Number of Farms	348	304	283	127	127	159
Acreage Farmed	47,236	44,224	36,150	32, 040	30,399	25,646
Average Size (Acres)	136	145	128	252	239	161
Percent of County Farmed	24.4	22.8	18.6	16.5	15.7	13.2
Average Value of Land & Buildings	$55,867	$87,184	$138,801	$102,246	$145,047	$189,924

Source: Census of Agriculture, 1978 - Issued 1980

ROANOKE COUNTY

Land in Farms According to Use

1969, 1974, and 1978

	Total Farms (Acres)		
	1969	1974	1978
Total Crop Land	23,236	14,153	14,210
Harvested Crop Land	7,713	6,964	6,888
Pasture	9,274	6,623	6,540
Other	6,249	566	782
Total Woodland	16,424	17,996	15,963
Other Farm Land[1]	7,576	12,075	5,977

1. Includes house lots, ponds, roads, wasteland.
Source: Census of Agriculture, 1978 - Issued 1980

Roanoke County - Grain Crops

	1969	1974	1978	1981	% Change 1969-1981
Planted Acres					
Corn	999	938	949	1,000	—
Barley	221	144	79	150	-32.1
Wheat	575	640	239	400	12.7
TOTAL	1,795	1,722	1,267	1,550	-13.7

Source: Census of Agriculture, 1969, 1974, 1978
Virginia Agricultural Statistics, 1982

Roanoke County - Orchards

	1969	1974	1978	1981	% Change 1969-1981
Orchard Acres	1,283	989	451	373[1]	-70.9

1. Estimated
Source: Census of Agriculture, 1969, 1974, 1978
Virginia Agricultural Statistics, 1982

Financial Institutions

The commercial banks in the Roanoke County-Roanoke-Salem area are as follows: Bank of Shawsville, Bank of Virginia, Central Fidelity Bank, Colonial American National Bank, First National Exchange Bank, First Virginia Bank, Salem Bank and Trust, Sovran Bank, United Virginia Bank. There are six savings and loan associations in the area: Charter Federal Savings and Loan Association, First Federal Savings and Loan Association of Roanoke, Jefferson Savings and Loan Association, Southwest Virginia Savings and Loan Association, Virginia Federal Savings and Loan Association, and Virginia First Savings and Loan Association. There are thirty-six credit unions operating in the area. The following tables provide information concerning the aforementioned establishments.

Number of Lending Institutions

	Roanoke County	Roanoke City	Salem City
Commercial Banks			
Banks	7	7	5
Offices	24	36	13
Savings and Loan Associations			
Associations	6	3	3
Offices	13	8	3
Credit Unions	0	25	11

Source: Tayloe Murphy Institute

Financial Institutions

Assets and Deposits, 1982 ($000)

Institution	Assets	Deposits
Bank of Shawsville	$ 21,892	$ 19,769
Bank of Virginia*	3,353,246	2,530,131
Central Fidelity Bank*	2,532,764	2,005,316
Colonial American National Bank*	324,697	249,145
First National Exchange Bank*	3,224,685	2,500,507
First Virginia Bank*	2,016,103	1,801,569
Salem Bank & Trust	20,025	18,242
Sovran Bank*	6,668,513	5,429,022
United Virginia Bank*	4,848,000	3,444,000
Charter Federal Savings & Loan*	320,002	277,027
First Federal Savings & Loan*	344,851	299,602
Jefferson Savings & Loan*	261,270	222,004
Southwest Virginia Savings & Loan	55,930	52,008
Virginia Federal Savings & Loan*	546,000	468,000
Virginia First Savings & Loan*	249,118	180,947

*Indicates Statewide Assets and Deposits
Source: Annual Reports of Respective Institutions

Financing for community and economic development is also available from sources other than those listed above. The Virginia Industrial Development

Corporation (VIDA) is a private lending organization chartered by the Virginia General Assembly to extend credit for industrial development to those who cannot obtain conventional financing. The Small Business Administration (SBA) and the Farmers Home Administration (FMHA) also are available for providing financial assistance to business.

The primary local source of non-conventional financing is the Roanoke County Industrial Development Authority (IDA). This organization is authorized to issue bonds to finance industrial facilities (medical facilities, multi-state regional or national headquarters offices or operations centers, pollution control facilities, home for the aged, and non-profit institutions of collegiate education. The Virginia Supreme Court has ruled that retail sales facilities are "industrial" and can be financed by an IDA. These financings are accomplished via the issuance of tax-exempt bonds. No financial obligations or liabilities are incurred by the IDA, the County, or the Commonwealth. As of June 30, 1982, the Roanoke County IDA had almost $60 million of outstanding long-term debt.

The Western Virginia Development Company is another local incorporated organization whose sole purpose is to develop new industry and businesses in the cities of Roanoke, Salem, Clifton Forge, and Covington and the counties of Roanoke, Allegheny, Botetourt, and Craig. This company, which was chartered by the Fifth Planning District Commission, provides financing which augments funding available from banks and loan agencies.

Financial counseling is also available from the Fifth Planning District Commission, the Salem-Roanoke County Chamber of Commerce, and the Merchants Association of Roanoke Valley.

INCOME CHARACTERISTICS

Wages

In 1982, categorical weekly wages earned by workers employed by firms located in Roanoke County were comparable to the respective state averages. The average weekly wages for workers employed in Roanoke County and Virginia during the third quarter of 1982 were $278, respectively. The average weekly wage for workers employed within the SMSA, however, was only $253.

During the third quarter of 1982, workers in the transportation, communications, and utilities sector earned the highest weekly wages of any employment category in the County. The retail and wholesale trade sector disbursed the highest quarterly gross wages, over $16 million, or 29 percent of the total wages earned in the County. Manufacturing workers in Roanoke County earned virtually the same ($330/week) as manufacturing production workers in Virginia ($331/week), but less than the national average ($340/week).

Detailed manufacturing wage data, published by the Virginia Department of Labor and Industry in April, 1983, is available, but only for the Roanoke SMSA. According to this data, average weekly earning paid to manufacturing workers in the SMSA has remained relatively stable since the first quarter of 1982. The average weekly hours worked by manufacturing production employees in the SMSA declined from 39.5 hours in March, 1982 and 39.2 hours in March, 1983. Within this study period, both weekly wages paid and hours worked increased significantly within the fabricated metal products sector. Conversely, hours worked by food products workers declined from 43.5 to 41.7 between March, 1982 and March, 1983. This decline resulted from a decrease in overtime hours and a recall of laid-off workers, an indication of economic resurgence. This data is examined in detail in the following tables.

Wages - Third Quarter, 1982

(By Place of Work)

Quarterly Gross Wages

Category	Roanoke County	Roanoke SMSA
Agriculture, Forestry & Fisheries	$ 606,052	$ 1,485,044
Mining and Quarrying	310,058	518,765
Construction	5,114,527	17,615,918
Manufacturing	11,994,769	84,105,832
Transportation, Communication and Utilities	3,773,891	23,105,243
Trade	15,858,253	76,313,131
Finance, Insurance, and Real Estate	4,640,557	23,096,836
Services	12,117,177	63,664,031
Total	$54,415,284	$289,904,800

Average Weekly Wage Per Worker

Category	Roanoke County	Roanoke SMSA	Virginia
Agriculture, Forestry & Fisheries	$190	$187	$193
Mining and Quarrying	$367	$380	$424
Construction	$267	$268	$306
Manufacturing	$330	$265	$331
Transportation, Communications, & Utilities	$450	$378	$419
Trade	$296	$208	$226
Finance, Insurance & Real Estate	$292	$253	$287
Services	$209	$194	$270
Average Weekly Wage	$278	$253	$287

Source: Virginia Employment Commission

ESTIMATED HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS IN MANUFACTURING INDUSTRIES ROANOKE SMSA

Industry Group	Avg. Weekly Earnings		Avg. Weekly Hours		Avg. Hourly Earnings	
	3/83	3/82	3/83	3/82	3/83	3/82
Manufacturing	$265	$260	39.2	39.5	$6.75	$6.58
Durable Goods	268	268	39.1	39.7	6.86	6.76
Fabricated Metal Prod.	271	246	40.8	38.1	6.63	6.45
Fabricated Structural Metal Prod.	272	229	40.8	38.1	6.63	6.45
Non-durable Goods	261	250	39.4	39.3	6.63	6.36
Food & Kindred Prod.	296	282	41.7	43.5	7.09	6.48
Textile Mill Prod.	235	204	39.9	37.0	5.88	5.52

Adjusted Gross Income (AGI)

The Tayloe Murphy Institute defines adjusted gross income as follows: AGI, other than certain deductions (primarily business expense), is equal to gross income except for Social Security benefits and other transfer payments, employer contributions to private pension and health plans, non-cash imputed income, and income in-kind. The AGI data covers all individuals and married couples required to file a return: 1) anyone who had Virginia income tax withheld or who paid an estimated income tax; 2) any individual with AGI more than $3,000; 3) a married couple with both persons under age 65 with a combined AGI more than $3,000; 4) a married couple with one spouse 65 or over with a combined AGI more than $3,500; and 5) a married couple with both persons 65 or over with a combined AGI more than $4,500.

In 1981, AGI totaled $41.2 billion and amounted to 73 percent of Virginia personal income. Personal income is a broad measure of income that includes transfer payments and certain types of non-cash income which are not taxable.

The proportion of the population covered by the AGI data can be roughly estimated by comparing the reported number of personal and dependent exemptions with a separate count of the total population. In 1981, the number of exemptions was 4,758,659 or 88 percent of the 1981 Census population of 5,425,000 as estimated by the Census Bureau.

The statewide median adjusted gross income for individuals in 1981 was $8,372, a $1,449 or 20.9 percent increase from the 1979 value of $6,923. The 1981 median adjusted gross income for families in Virginia was $23,602, an increase of 19.5 percent from the 1979 figure of $19,752.

Roanoke County and the Roanoke SMSA were both significantly below the statewide median adjusted gross income figures for individuals in 1979, 1980, and 1981. Although the SMSA was below the statewide median adjusted gross income figure for families during the study period, the County was substantially above the average median figure for the state in each of the three years. The percentage increases in AGI for residents of the County, the SMSA, and the state during the study period were significantly below the cumulative inflation rate of 335.2 percent, suggesting a definite loss of real buying power. These trends are examined in more detail in the tables **Median Adjusted Gross Income 1979, 1980, 1981** below.

Median Adjusted Gross Income
1979, 1980, 1981

	Roanoke County	Roanoke SMSA	Virginia
AGI - Individual			
1979	$6,348	$6,494	$6,923
1980	7,086	7,221	7,673
1981	7,863	7,872	8,372
% Change - 1979-1981	23.9	21.2	20.9

Median Adjusted Gross Income - Continued
1979, 1980, 1981

	Roanoke County	Roanoke SMSA	Virginia
AGI - Family			
1979	$21,901	$18,555	$19,752
1980	23,869	20,994	21,735
1981	25,821	22,643	23,602
% Change	17.9	22.0	19.5

1. Cumulative rate of inflation 1979 to 1981 was 35.2 percent.
2. Calculated by Roanoke County, Department of Development.

Source: Tayloe Murphy Institute, April 1983.

Effective Buying Income (EBI)

Effective Buying Income is a measure of market potential developed by Sales and Marketing Management, a national marketing publication. EBI indicates a general ability to buy and is essentially "disposable personal income" minus compensation paid to military and diplomatic personnel assigned to overseas locations.

The Buying Power Index (BPI) is a weighted index that converts the elements of population, EBI, and retail sales into a measurement of a market's ability to buy and expresses EBI and BPI figures for Roanoke County, the SMSA, and the state are a follows:

Effective Buying Income, 1981

	Roanoke County	Roanoke SMSA	Virginia
Total EBI ($000)	635,421	1,844,640	47,379,155
Median Household EBI ($)	23,101	19,135	20,287

Effective Buying Income, 1981 - Continued

	Roanoke County	Roanoke SMSA	Virginia
Percent of Households by EBI Groups			
Under $10,000	14.1	22.9	21.9
$10,000 - $14,999	10.6	14.1	13.2
$15,000 - $24,999	31.9	30.7	26.9
$25,000 - $49,999	38.5	28.6	30.7
$50,000 & Over	4.9	3.7	7.3
Buying Power Index	.0305	.1022	2.39

Source: "Survey of Buying Power," Sales and Marketing Management, July, 1982.

The median household EBI of Roanoke County is almost $4,000 greater than that of the SMSA and more than $6,000 greater than the median household EBI of Roanoke City. Roanoke County has the highest percentage of SMSA households with Effective Buying Incomes exceeding $15,000. The projected Effective Buying Incomes for the County, the SMSA, and the State as prepared by Sales and Marketing Management are as follows:

Projected Effective Buying Income, 1986

	Roanoke County	Roanoke SMSA	Virginia
Total EBI ($)	1,129,403	3,325,042	84,442,000
% Change 1981 - 1986	77.7	80.3	78.2
Average Household EBI ($)	38,811	35,335	38,724
% Change 1981 - 1986	68.0	84.8	90.9
Buying Power Index	.0315	.1041	2.42

Source: "Survey of Buying Power," Sales and Marketing Management, October, 1982.

Low- and Moderate-Income (L/M)

Low- and moderate-income is a variable statistical measure of income used by the U.S. Department of Housing and Urban Development as well as the Virginia Department of Housing and Community Development to prioritize applicants for Community Development Block Grant (CDBG) monies. Low- and moderate-income is defined as 80 percent of a locality's median gross income. Median gross income will vary according to the economic characteristics of a particular community and is valuable in assessing economic vitality and the relative cost of living. The low- and moderate-income figures applicable to Roanoke County households as of May, 1983 are as follows:

L/M INCOME-ROANOKE COUNTY[1]

Household Size	1	2	3	4
Median Income	$17,375	$19,813	$22,313	$24,813
L/M Income	13,900	15,850	17,850	19,850

Household Size Continued	5	6	7	8
Median Income	$26,375	$27,875	$29,438	$31,000
L/M Income	21,100	22,300	23,550	24,800

[1]As an example, a family of four individuals residing in Roanoke County earning a combined income of $19,850 or less would be classified as a low- and moderate-income household.

Source: Virginia Department of Housing and Community Development, May 1983.

URBAN COUNTY MEDIAN INCOME COMPARISON

Household Size	1	2	3	4
Roanoke County	$17,375	$19,813	$22,313	$24,813
Henrico County	19,375	22,250	25,000	27,813
Loudon County	22,750	26,000	29,250	32,500

Household Size Continued	5	6	7	8
Roanoke County	$26,375	$27,875	$29,438	$31,000
Henrico County	29,563	31,250	33,000	34,750
Loudon County	34,500	36,563	38,563	40,625

Source: Virginia Department of Housing and Community Development, May, 1983.

Median income for a four-person household in Roanoke County in May, 1983 was $7,700 less than that of Loudon County in Northern Virginia and $3,000 less than the median income of Henrico County. These differences reflect the relative costs of living associated with the Roanoke SMSA, the Richmond SMSA, and Northern Virginia.

Poverty Income

Poverty income is defined as 50 percent of a locality's gross median income. Like L/M income, poverty levels are variable. The poverty income figures for Roanoke County households in May, 1983 are as follows:

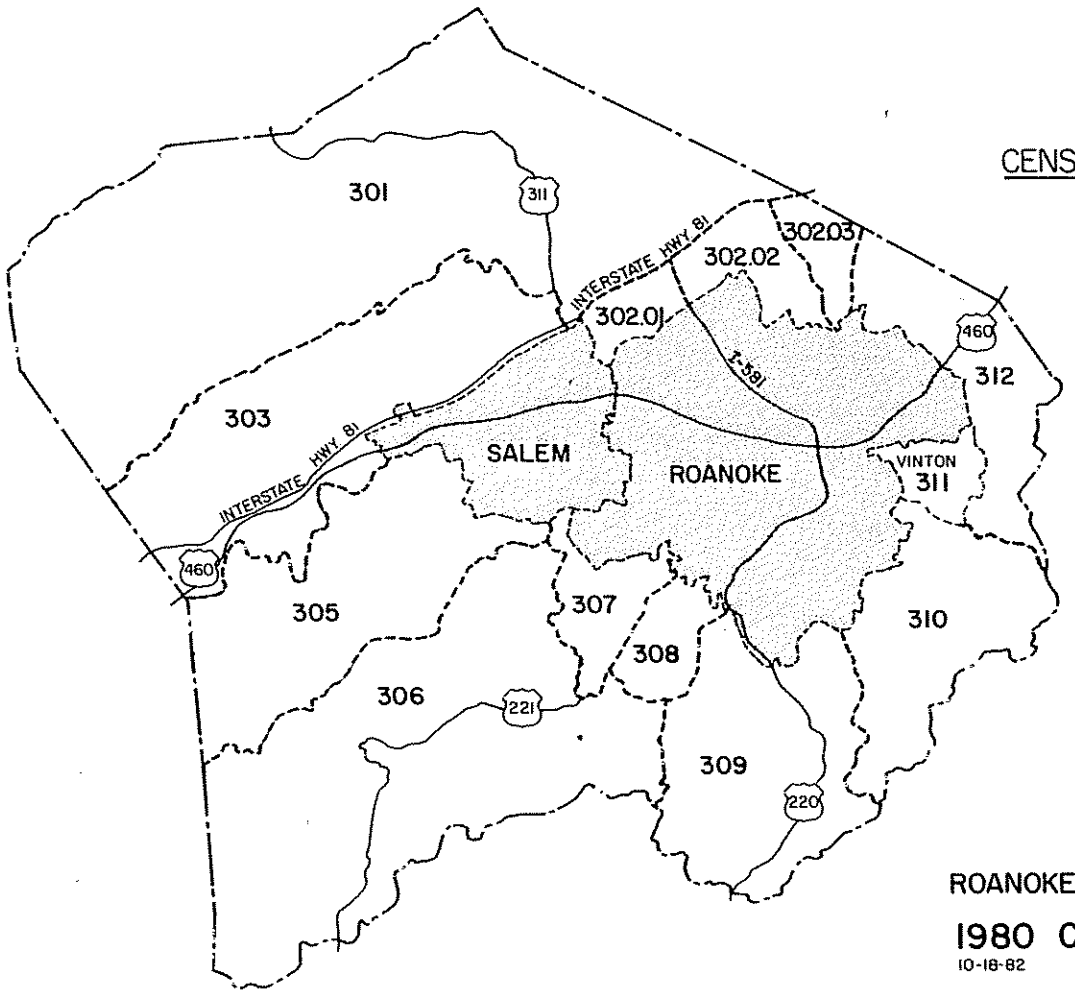
Poverty Income - Roanoke County

Household Size	1	2	3	4
Median Income	$17,375	$19,813	$22,313	$24,813
Poverty Income	8,688	9,907	11,157	12,407
Household Size Continued	5	6	7	8
Median Income	$26,375	$27,875	$29,438	$31,000
Poverty Income	13,188	13,938	14,719	15,500

Source: Virginia Department of Housing and Community Development, May, 1983.

Approximately 94 percent of all County households are above the poverty level for their respective household sizes. Conversely, 6 percent of the County household are below their respective poverty levels. Households below the poverty income level are concentrated primarily in census tracts 301 (Catawba), 309 (Clearbrook), and 311 (Vinton). The table, **Percentage Distribution of Poverty Income Households, Roanoke County**, describes the above findings in greater detail (see also Figure 3-A).

PERCENTAGE OF POVERTY INCOME HOUSEHOLDS



CENSUS TRACT	% BELOW POVERTY LEVEL
301	10.2
302.01	3.7
302.02	5.4
302.03	2.5
303	7.4
305	5.7
306	5.9
307	2.4
308	4.4
309	8.6
310	7.9
311	8.7
312	5.8

ROANOKE COUNTY, VIRGINIA

1980 CENSUS TRACTS

10-18-82

FIGURE 3-A

Percentage Distribution of Poverty Income Households
Roanoke County

Census Tract	Above Poverty Level	Below Poverty Level	Total
301	89.8	10.2	100
302.01	96.3	3.7	100
302.02	94.6	5.4	100
302.03	97.5	2.5	100
303	92.6	7.4	100
305	94.3	5.7	100
306	94.1	5.9	100
307	97.6	2.4	100
308	95.6	4.4	100
309	91.4	8.6	100
310	92.1	7.9	100
311	91.3	8.7	100
312	94.2	5.8	100
County Percentage	94.2	5.8	100

Source: Bureau of Census
Roanoke County, Department of Development

LABOR RESOURCES

Labor Force Components - By Place of Residence

In February, 1983, the urban labor force residing in Roanoke County was composed of 35,619 workers. The unemployment rate in the County was 5.9 percent. The civilian labor force residing in the Roanoke SMSA in February, 1983 was 112,400 persons. The unemployment rate was 8.5 percent. The February, 1983 unemployment rates for Virginia and the Nation were 8.6 percent and 11.3 percent, respectively.

The annual average civilian labor force residing in the Roanoke SMSA increased only .72 percent, or 800 workers, between 1978 and 1982. The total annual average employment in the SMSA declined 1,500 workers or 1.4 percent between 1978 and 1982. The annual average unemployment rate in the Roanoke SMSA increased from 5.6 percent in 1978 to 7.7 percent in 1982.

Unemployment in the Roanoke SMSA equaled or exceeded the annual average rate of unemployment in the State in 1978, 1981, and 1982. However, the annual average rate of unemployment in the SMSA has been consistently lower than that of the Nation (see Figure 3-B). The tables, **Components of the Civilian Labor Force**, describe these trends in more detail

Components of the Civilian Labor Force
Roanoke County
March 1982 to February 1983
By Place of Residence

Component	March	April	May	June	July	Aug.
Civilian Labor Force	35,240	35,262	35,468	35,823	35,845	35,719
Total Employment	33,503	33,522	33,806	34,103	33,834	33,968
Unemployment Number	1,737	1,740	1,662	1,720	2,011	1,751
Unemployment Percent	4.9	4.9	4.7	4.8	5.6	4.9

Component Continued	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Civilian Labor Force	35,375	35,196	35,692	35,683	35,869	35,619
Total Employment	33,626	33,255	33,571	33,658	33,591	33,526
Unemployment Number	1,749	1,941	2,121	2,025	2,278	2,093
Unemployment Percent	4.9	5.5	5.9	5.7	6.4	5.9

Source: Virginia Employment Commission

Components of the Civilian Labor Force
Roanoke SMSA[1]
Annual Averages 1977 to 1982, February 1983
By Place of Residence

Component	Feb. 1983	1982	1981
Civilian Labor Force[2]	112,400	112,400	110,500
Total Employment[2]	102,900	103,800	103,700
Unemployment Number[2]	9,600	8,700	6,800
Unemployment Percent	8.5	7.7	6.2
State Rate (%)	8.6	7.7	6.1
National Rate (%)	11.3	9.7	7.6

UNEMPLOYMENT RATES

PERCENTAGE FLUCTUATIONS

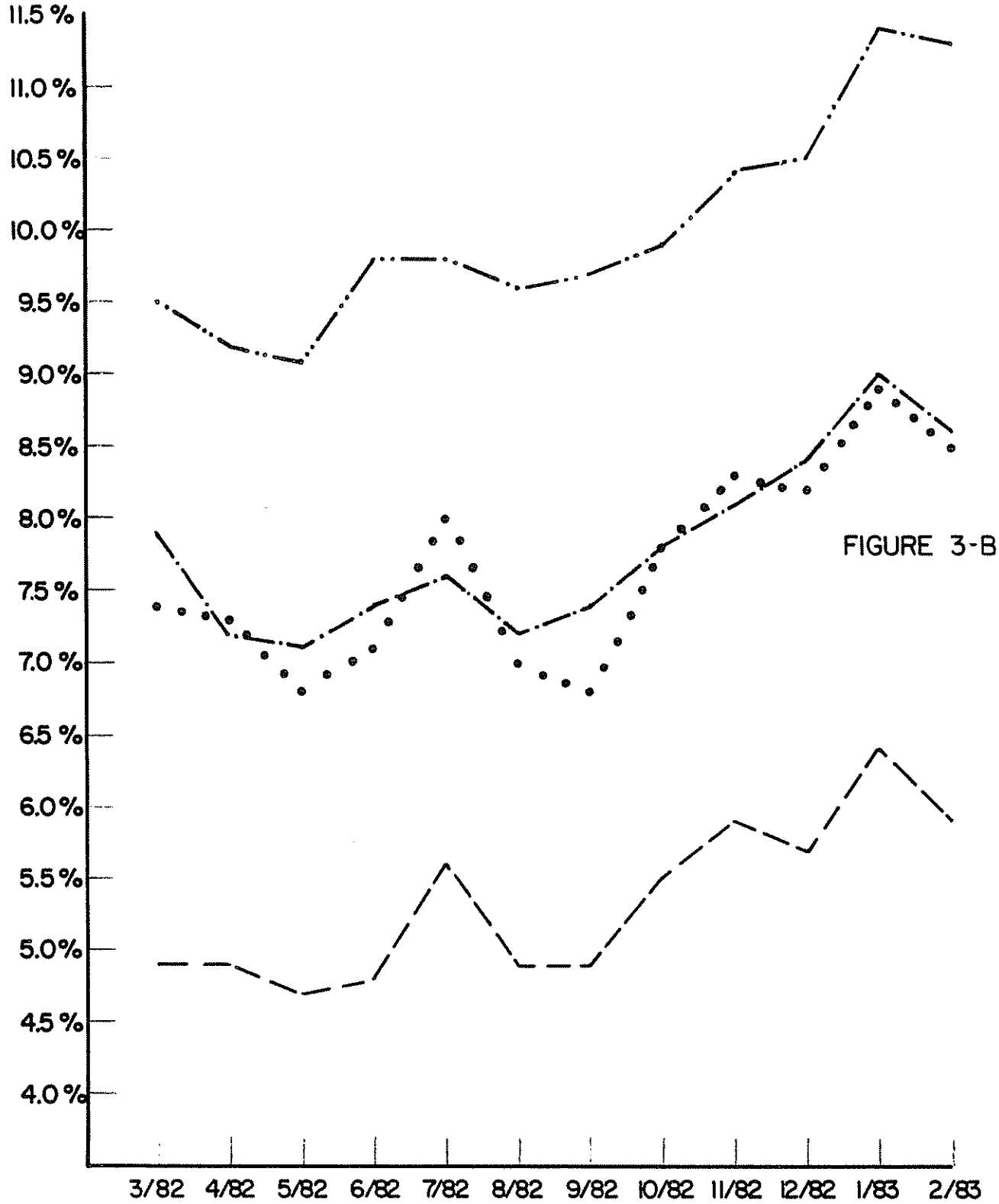


FIGURE 3-B

— — — ROANOKE COUNTY

• • • • • ROANOKE S.M.S.A.

—·—·— STATE OF VIRGINIA

·—·—· UNITED STATES

Source: Virginia Employment Commission

Components of the Civilian Labor Force - Continued
Roanoke SMSA[1]
Annual Averages 1977 to 1982, February 1983
By Place of Residence

Component Continued	Feb. 1980	1979	1978
Civilian Labor Force[2]	110,600	110,600	111,600
Total Employment[2]	105,500	105,900	105,300
Unemployment Number[2]	5,100	4,700	6,300
Unemployment Percent	4.6	4.3	5.6
State Rate (%)	5.0	4.7	5.4
National Rate (%)	7.1	5.8	6.1

[1]As defined by the 1980 Census
[2]Rounded to the nearest hundred.

Sources: Virginia Department of Labor and Industry, U.S. Bureau of Labor Statistics, and Virginia Employment Commission.

Labor Force Components - By Place of Work

Roanoke County

In the third quarter of 1982, almost 30 percent of all persons working in Roanoke County were employed by service firms and governmental agencies. The second largest category, trade, employed over 27 percent of all individuals working within the County. Manufacturing concerns employed over 18 percent of all persons working in Roanoke County during the study period.

In the third quarter of 1978, only 23 percent of the persons working in the County were employed by service firms and governmental agencies. Retail and wholesale trade establishments employed over 29 percent of the individuals working within Roanoke County. Manufacturing concerns employed over 25 percent of the persons working within the County.

During the five-year study period, 1978 to 1982, the average number of persons working within Roanoke County ranged from a high of 16,987 in 1979 to a low of 15,035 in 1982.

Roanoke SMSA

In February, 1983, over 36 percent of the persons engaged in nonagricultural pursuits within the Roanoke SMSA were employed by service firms and governmental agencies. Retail and wholesale trade establishments employed over 24 percent of all nonagricultural workers. Manufacturing concerns employed almost 20 percent of all nonagricultural employees working within the SMSA.

In 1978, almost 34 percent of the persons engaged in nonagricultural activities within the SMSA were employed by service concerns and governmental agencies. Retail and wholesale establishments employed over 25 percent of all nonagricultural workers. Manufacturing firms employed almost 21 percent of all nonagricultural employees working within the SMSA.

During the study period, 1978 to February, 1983, the average number of nonagricultural workers employed within the SMSA ranged from a high of 105,000 in 1979 to a low 99,800 in 1983. The following tables, **Components of the Civilian Labor Force**, describe these trends more fully.

Components of the Civilian Labor Force
Roanoke County
Average Employment - 3rd Quarter - 1978 to 1982
By Place of Work

Industry Group	# of Est. 1982	1982	1981	1980	1979	1978
Agriculture, Forestry and Fish	20	246	219	183	192	163
Mining & Quarrying	4	65	148	119	101	139
Construction	183	1,473	1,631	1,730	1,786	1,603
Manufacturing	44	2,797	3,300	3,169	3,926	3,970
Transportation, Comm., & Util.	20	645	660	695	802	720
Trade	282	4,119	4,179	4,481	5,062	4,610
Finance, Insurance, & Real Estate	57	1,223	1,254	1,223	1,216	1,073
Services & Government	303	4,467	4,639	4,121	3,902	3,572
Total Employment	913	15,035	16,030	15,721	16,987	15,850

Note: Railroad, self-employed (including agricultural) and unpaid family workers are not included.

Source: Virginia Employment Commission.

Components of the Civilian Nonagricultural Labor Force
Roanoke SMSA
Annual Average Employment - 1978 to 1982
By Place of Work
(In Thousands)

Industry Group	1982	1981	1980	1979	1978
Mining & Quarrying	.2	.2	.1	.1	.2
Construction	4.3	4.7	5.5	5.9	5.9
Manufacturing	20.0	21.1	21.3	21.1	21.2
Transportation, Comm., & Util.	9.7	9.7	10.1	10.2	9.1
Finance, Insurance, & Real Estate	6.0	6.1	6.3	6.2	5.8
Services & Government	36.0	36.1	36.2	35.4	34.9
Total Employment	101.6	102.9	104.9	105.0	102.9

Source: Virginia Department of Labor and Industry, U.S. Bureau of Labor Statistics, and Virginia Employment Commission.

Components of the Civilian Nonagricultural Labor Force
Roanoke SMSA
February 1982 and 1983
By Place of Work
(In Thousands)

	February, 1983	February, 1982	Net Change
Manufacturing	19.7	20.4	-.7
Durable Goods	10.6	11.6	-1.0
Non-durable Goods	9.1	8.8	.3
Non-manufacturing	80.0	80.1	-.1
Mining	.1	.2	-.1
Construction	4.2	4.1	.1
Transportation, Comm. & Util.	9.2	9.6	-.4
Trade	24.4	24.3	.1
Finance, Insurance, & Real Estate	5.8	6.0	-.2
Services & Government	36.3	35.9	-.4
Total Nonagricultural Employment	99.7	100.5	-.8

Source: Virginia Department of Labor and Industry, U.S. Bureau of Labor Statistics, and Virginia Employment Commission.

Labor Legislation

The Virginia Department of Labor and Industry is responsible for administering and enforcing most of the State's labor laws. At the center of this legislation is the right-to-work statute which declares that the right of persons to work cannot be denied or abridged on account of membership or nonmembership in any labor union or labor organization. In addition, an employer cannot require employees to become or remain members of a labor union or require that dues or fees be paid to a union or labor organization as a condition of employment.

The Virginia Employment Commission administers unemployment insurance. An employer must maintain insurance if the gross payroll exceeds $1,500 per calendar quarter or if an employee is engaged in 20 weeks of full or part-time employment during the calendar year. The Workmen's Compensation Act is regulated by the Industrial Commission of Virginia.

According to the U.S. Department of Labor, only 12.7 percent of the State's nonagricultural employees belonged to unions in 1978. The national average that year was 23.6 percent. Only six states had a smaller percentage of nonagricultural, nonunion employees than Virginia. Between 1976 and 1980 only 0.13 percent of nonagricultural working time was lost in Virginia because of work stoppages. The national average for the same time period was 19 percent higher. Almost 60 percent of the working time lost to strikes in Virginia from 1976 to 1980 was in mining and transportation. Employment in these two employment categories comprised less than 6 percent of all individuals working within the Roanoke SMSA in February, 1983.

POTENTIAL ECONOMIC TRENDS

Short Range

Conincident indicators such as bank debts, electricity consumed, advertising linage, water consumed, and retail sales, move concurrently with business activities. Leading economic indicators such as building permits and new car registrations generally precede economic recovery by about five months.

Building permits issued in Roanoke County, Roanoke City, and the State increased significantly in April, 1983 when compared to April, 1982. This activity indicates that construction starts will commence shortly. New car sales also increased, although it must be remembered that 1982 was a particularly poor year for new automobile sales. Nevertheless, both housing starts and new car sales have previously played major roles in reversing recessionary trends since World War II.

With the exception of newspaper advertising linage, coincident indicators rose modestly from April, 1982 to April, 1983 perhaps indicating greater impending gains in 1983 and 1984. The table, **Selected Business and Economic Indicators, April 1983**, describes these trends in greater detail.

Selected Roanoke Area Businesses and Economic Indicators
April 1983
Percentage Change from April 1982

	Bank Debits	Building Permits	Electricity Consumed	Newspaper Adv. Linage
State	12.4	67.8	8.1	-3.4
Roanoke City	4.7	185.3	4.3	-5.1
Roanoke County	—	33.3	—	—

	New Car Registrations	Water Consumed	Retail Sales
State	74.5	-7.8	8.9
Roanoke City	75.6	1.0	9.3
Roanoke County	—	—	—

[1]Includes an increase of 106 percent in single family residential construction, from 35 units to 72 units.

Source: Virginia Business Report #277, May, 1983
Roanoke County, Department of Development

Longer Range

With the exception of agriculture, all employment categories within Roanoke County are expected to increase between 1983 and 1990. The service oriented occupations are expected to increase the most, over 22 percent, during the study period. Manufacturing employment will increase substantially prior to 1990 beginning with the influx of 240 new workers to be employed by AMP, Inc. in 1984.

Employment Projections
Roanoke County - Percentage Change
1983-1990

Category	Percentage Change
Agriculture Production	-11.0
Construction	5.7
Manufacturing	15.2
Transportation, Communications, Public Utilities	19.9
Wholesale Trade	7.9
Retail Trade	7.5
Finance, Insurance, Real Estate	16.3
Services	22.1
Government	13.7
Total	13.8

Source: Calculations by Roanoke County, Department of Development based upon statistics prepared by the Regional Economic Analysis Division of the U.S. Bureau of Economic Analysis.

CHAPTER 4

LAND USE & HOUSING CHARACTERISTICS

EXISTING LAND USE AND HOUSING CHARACTERISTICS

The area of Roanoke County (excluding the Town of Vinton) as determined by the land use inventory, is 158,900 acres or 248.28 square miles. The area, as defined by the 1983 Joint Legislative Audit and Review Commission of Virginia, is 158,649.6 acres or 247.89 square miles. The variance between these measurements is less than one-sixth of one percent.

Inventory Methodology

A field survey of the existing land uses within Roanoke County was completed June 1, 1983. Fourteen land uses were identified and cataloged on 350 orthophotography aerial base maps. The urbanized portions of the County were surveyed using maps prepared at a scale of one inch equals 100 feet. The suburban, rural, and undeveloped areas of the County were inventoried using less detailed maps.

Each land use parcel was defined and measured using the field data on the individual orthophotography maps. An accurate measurement of each parcel was obtained with an electronic digitizer. The land use information for each map was totalled and stored.

Existing Land Use

Approximately 26 percent of Roanoke County's total land area of 248.28 square miles is developed or committed. The remaining 74 percent is vacant. Of the developed or committed area, 41 percent is open space or parkland. Most of this land is within either the Havens State Game Refuge or the City of Roanoke Water Supply Reservation. Approximately 23 percent of the County's developed or committed land is used for agricultural purposes. An additional 17 percent is used for single family residential development. Road

rights-of-way comprise 11.4 percent of the total developed or committed land area. The measurements for existing land use are described in the table, **Existing Land Use - Roanoke County** and in Appendix B.

Past Land Use Trends 1974-1983

The City of Roanoke annexed 15.84 square miles of land from Roanoke County, January 1, 1976. Of these 10,138 acres, 5,544 were vacant. The remaining 4,594 acres were developed with residential, commercial, office, and industrial land uses.

Since the previous comprehensive plan was prepared in 1974, and excluding the annexed areas, approximately 1,750 net acres have been developed for single family residential use. An additional 142 net acres have been developed for either duplex or multi-family housing. Approximately 200 roads, lanes, and cul-de-sacs were constructed or extended from 1974 to July of 1983.

In terms of total development, 25 percent of the existing single family homes in Roanoke County were constructed within the last nine years. More than 53 percent of the duplex and multi-family units were built after 1974. Since 1974, approximately 321 net acres of office and institutional uses have been constructed. Commercial uses, which tend to be more intensely developed, increased almost 8 percent from 430 net acres to 463 net acres. Industrial land uses increased from 403 net acres in 1974 to 997 net acres in 1983. However, more than one-half of this particular increase may be attributed to the development of the regional landfill and numerous public utility facilities constructed to serve residential areas. Past land use trends in Roanoke County (excluding Vinton) are described in greater detail by the tables, **Land Use Changes, 1974-1983** and **New Construction - Roanoke County, VA, 1974-1983**, and by Figure 4A.

Existing Land Use - Roanoke County

Use	Acreage[1]	% of Total Area	% of Developed or Committed Area
Agriculture	9,550	6.01	23.01
Single Family	6,967	4.38	16.79
Two-Family	28	--	.07
Multi-Family	236	.15	.57
Mobile Home	73	.05	.18
Retail & Service Commercial	279	.18	.67
General Commercial	184	.12	.44
Office and Institutional	995	.63	2.40
Light Industrial	263	.17	.63
Heavy Industrial	734	.46	1.77
Park & Open Space	17,130	10.78	41.26
Street Right-of-way	4,712	2.97	11.35
Railroad Right-of-way	356	.22	.86
Total Developed or Committed Land	41,507	26.12	100.0
Vacant Land	117,393	73.88	
Total Area (248.28 square miles)	158,900	100.0	

Note: 1. Acreages are net amounts. Transportation rights-of-way are categorized separately.

Source: Field survey and measurement of land use acreages completed by Roanoke County, Department of Development.

New Construction - Roanoke County, Virginia

1974 - 1983

Building Type	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983[2]	Total[3]
Single-family[1]	763 (696)	632 (575)	571	694	557	434	357	325	248	281	4,862 (4,738)
Duplex[4]	16 (14)	-0- (-0-)	6	-0-	-0-	-0-	6	6	4	5	43 (41)
Multi-family[4]	64 (58)	95 (86)	346	408	843	121	23	52	3	-0-	1,955 (1,940)
Commercial	21 (19)	14 (13)	12	5	19	23	26	18	6	15	159 (156)
Industrial	28 (25)	26 (24)	18	23	30	25	8	8	3	3	172 (167)
Industrial	7 (6)	3 (3)	1	7	2	3	-0-	1	1	-0-	25 (24)
Total[3]	899 (818)	770 (701)	954	1137	1451	606	420	410	265	304	7,216 (7,066)

Source: Roanoke County, Department of Development

1. Does not include mobile homes.
2. As of 6/30/83.
3. Approximately 9% of buildings constructed in 1974 and 1975 were annexed by Roanoke City, January 1, 1976. Buildings remaining in the County are designated by ( ).
4. Denotes units, not buildings.

NEW CONSTRUCTION 1974-1983

ROANOKE COUNTY

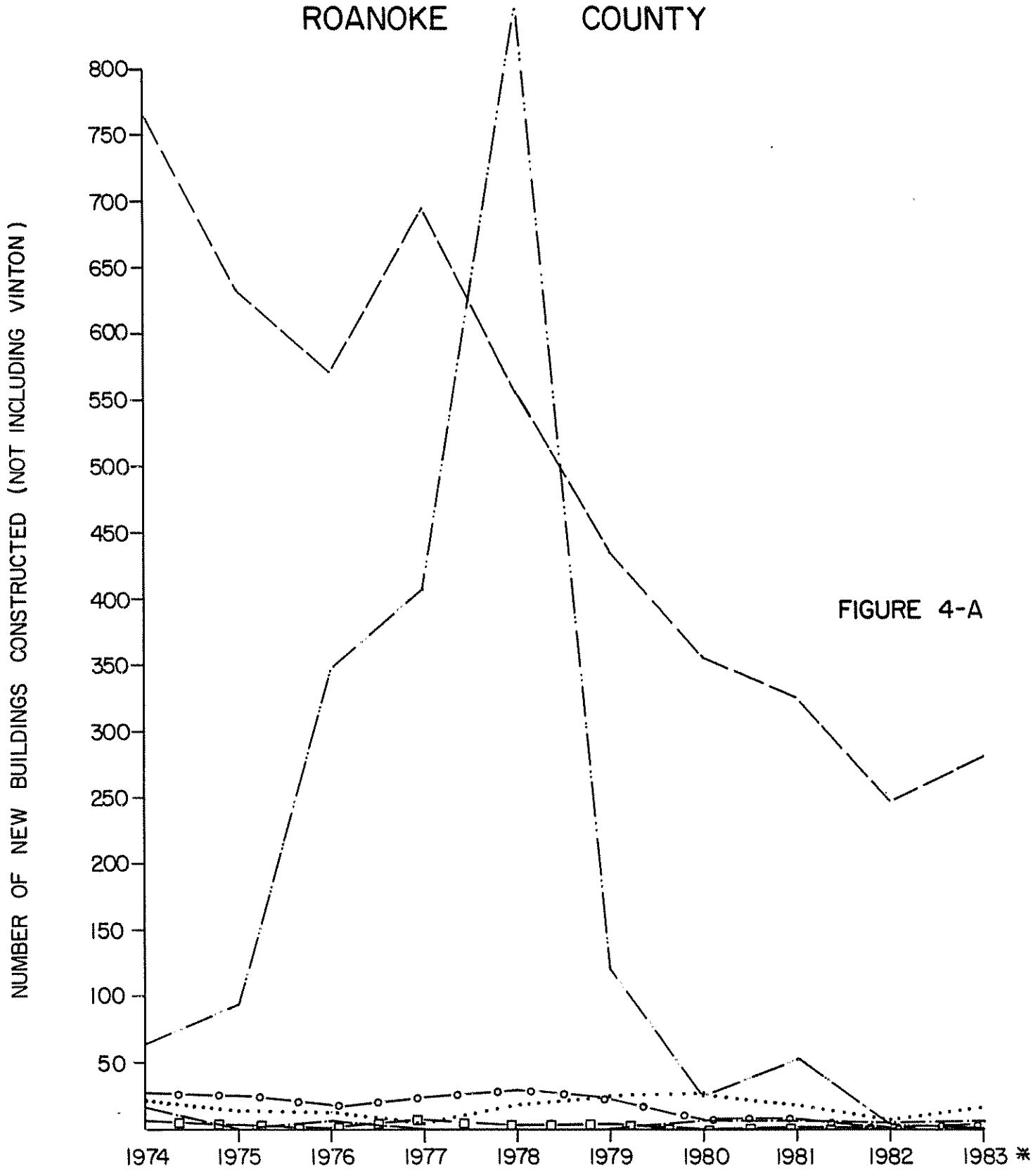


FIGURE 4-A

* As of 6/30/83

APPROXIMATELY 9% OF BUILDINGS CONSTRUCTED IN 1974 AND 1975 WERE ANNEXED BY ROANOKE CITY, JANUARY 1, 1976.

Land Use Changes, 1974-1983

Use	Acreage Increase	Average Annual Acreage Increase	Per Unit Acreage Increase
Single Family	1,750	184	.37
Duplex/Multi-Family	142	15	.07
Commercial	33	3	.21
Office and Institutional	321	34	1.92
Industrial	594	36[1]	14.95[1]
Street Right-of-Way	322	34	-
TOTAL	3,162	306	

1. Does not include regional landfill.

SOURCE: Roanoke County, Department of Development

General Future Land Use Requirements

Approximately 5,050 additional gross acres of land will be required for single and multi-family residential construction, as well as commercial, institutional, and industrial development by the year 2000. This estimate is based upon the continuation of past building trends, and assumes that the average household size will decline, the average annual population growth rate of 2.1 percent will remain stable from 1983 to the year 2000, and that existent land use policies and regulations will remain unchanged. The table, **Generalized Future Land Requirements** describes these expected trends.

Generalized Future Land Use Requirements

Roanoke County - 2000[1]

Use	Acreage
Single Family	3,036
Duplex/Multi-Family	248
Commercial	50
Office and Institutional	561
Industrial	594
Street Right-of-Way	561
TOTAL	5,050

1. Future land use requirements are in addition to existing acreages cited in table, Existing Land Use - Roanoke County. Total population of Roanoke, excluding Vinton, will be 93,000 in the year 2000.

SOURCE: Roanoke County, Department of Development

Past development trends are only points of reference for determining general future land use requirements. Detailed land use needs, as well as locational and spatial requisites, will be defined in Volume Three of the Comprehensive Development Plan.

Housing Characteristics

Excluding the Town of Vinton, there were 24,669 total housing units in Roanoke County as of June 1, 1983. Of this total, 76 percent were single-family and 14 percent were multi-family units. The remaining units were either duplexes, mobile homes or institutional group quarters.

Housing Conditions

The exterior physical condition of each single family, duplex, and multi-family structure was defined in accordance with the following criteria:

Sound	-	Indicates buildings in good condition and in need of routine maintenance only.
Deteriorated	-	Indicates buildings with deficiencies and in need of corrective measures significantly beyond those associated with routine maintenance.
Dilapidated	-	Indicates buildings with deficiencies that are impractical to repair.

Mobile homes and institutional group housing quarters were not assigned condition ratings.

A detailed profile of the condition of the housing stock within Roanoke County is presented in the table, **Housing Conditions - Roanoke County, 1983.**

Of the 22,437 housing units that were rated, 1,384 or slightly more than 6 percent, were either deteriorated or dilapidated. All of these 1,384 units were single family residences.

The concentrated areas of deteriorated or dilapidated housing are identified in Figure 4B and are described more fully in the table, Appendix C, **Concentrated Areas of Deteriorated or Dilapidated Housing - Roanoke County-1983.**

Housing Stock Age

Approximately 45 percent of all occupied housing units in Roanoke County were constructed after 1970. Three-fourths of all occupied housing units in the County were built within the last twenty-five years. Less than 8 percent of all occupied housing units in the County are more than forty years old.

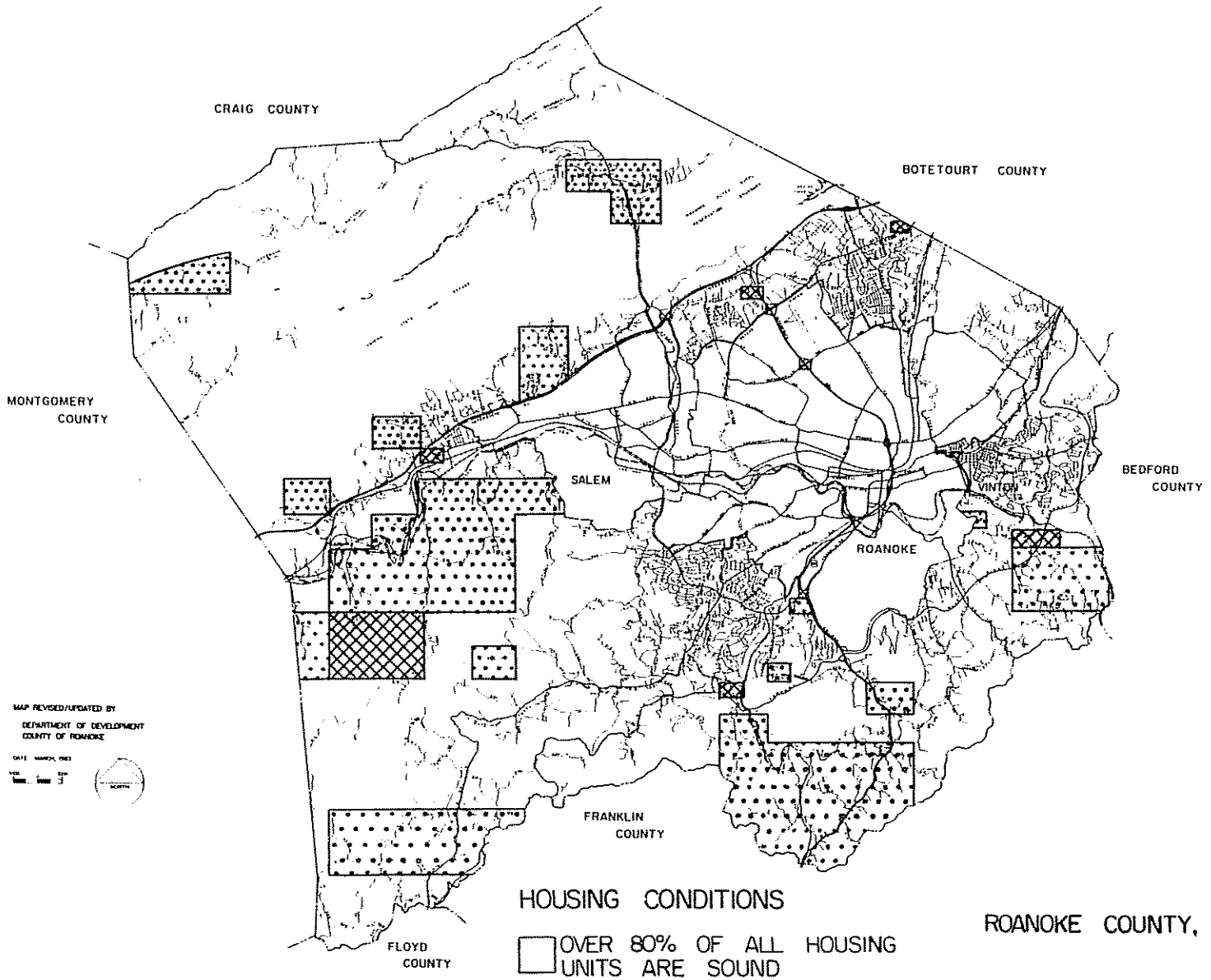

CRAIG COUNTY
BOTETOURT COUNTY
MONTGOMERY COUNTY
SALEM
VINTON
BEDFORD COUNTY
ROANOKE
FRANKLIN COUNTY
FLOYD COUNTY
MAP REVISED/UPDATED BY
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
HOUSING CONDITIONS
OVER 80% OF ALL HOUSING UNITS ARE SOUND
20%-50% OF ALL HOUSING UNITS DETERIORATED OR DILAPIDATED
OVER 50% OF ALL HOUSING UNITS DETERIORATED OR DILAPIDATED
ROANOKE COUNTY, VA.

FIGURE 4-B

Housing Conditions - Roanoke County, June, 1983

Type of Dwelling / Condition:	UNITS A	B	C	Total Units
Single-family	17,332	1,049	335	18,716
Duplex	202	-0-	-0-	202
Multi-faily	3,513	-0-	-0-	3,513
Mobile home	—	—	—	658
Institutional Group Housing	—	—	—	1,580
Total				24,669

Notes: The 1980 census reported 23,469 units of year-round housing in Roanoke County (does not include the Town of Vinton). An additional 1,335 units of housing were constructed between March, 1980 and June 1, 1983.[1] 135 units were demolished, destroyed by fire, or converted to commercial uses after March, 1980.

23,469 units plus 1,335 units minus 135 units = 24,669 units.

1. Includes mobile homes permitted.

Source: Roanoke County, Department of Development

Housing stock age is a major determinant of the number of deteriorated and dilapidated units within the County. By the year 2000, the percentage of occupied units more than forty years old will be approximately 20 percent of the total number of occupied units. In 1983, almost 6 percent of all housing units in the County were either deteriorated or dilapidated. By correlating unit age with condition, this percentage could reasonably be expected to triple to 18 percent by the year 2000. The following table documents the current age of housing units within the County.

Housing Stock Age - Occupied Units[1]

Time Period	Number of Units	% of Total Units
1979-June, 1983	2,123	9.1
1975-1978	3,376	14.5
1970-1974	4,903	21.0
1960-1969	6,495	27.7
1950-1959	3,305	14.2
1940-1949	1,299	5.6
1939 or Before	1,834	7.9
Total Occupied Units	23,335	100.0

1. Does not include Town of Vinton. 23,335 occupied units + 1,334 vacant units equals 24,669 total units.

Source: Bureau of Census
Roanoke County, Department of Development

Housing Units Lacking Complete Plumbing Facilities

In 1983, there were approximately 340 housing units that were lacking complete plumbing facilities. Of these units, almost 75 percent were located in the rural areas of Bent Mountain, Clearbrook, Mason's Valley, and Catawba. The greatest single concentration (23 percent) was found in Clearbrook. The following table describes these data further.

Occupied Housing Units Lacking Complete Plumbing Facilities - 1983[1]

Population Residing in Units	Percent of Total Population	Number of Housing Units	Percent of Total Units
941	1.2	340	1.4

1. Does not include Town of Vinton

Source: Bureau of Census
Roanoke County, Department of Development

Vacancy Status and Tenure

The vacancy rate for year-round housing units in Roanoke County, excluding the Town of Vinton, in 1980 was 5.68 percent. Approximately 75 percent of all housing units in the County in 1980 were owner-occupied. The remaining 20 percent were renter-occupied. The following table describes these findings in greater detail.

Vacancy and Tenure - 1980

	Owner-Occupied	Renter-Occupied	Vacant	Total Year-round
Total units	17,576	4,559	1,334	23,469
% of Total year-round	74.9	19.4	5.7	100.0

Source: Bureau of the Census

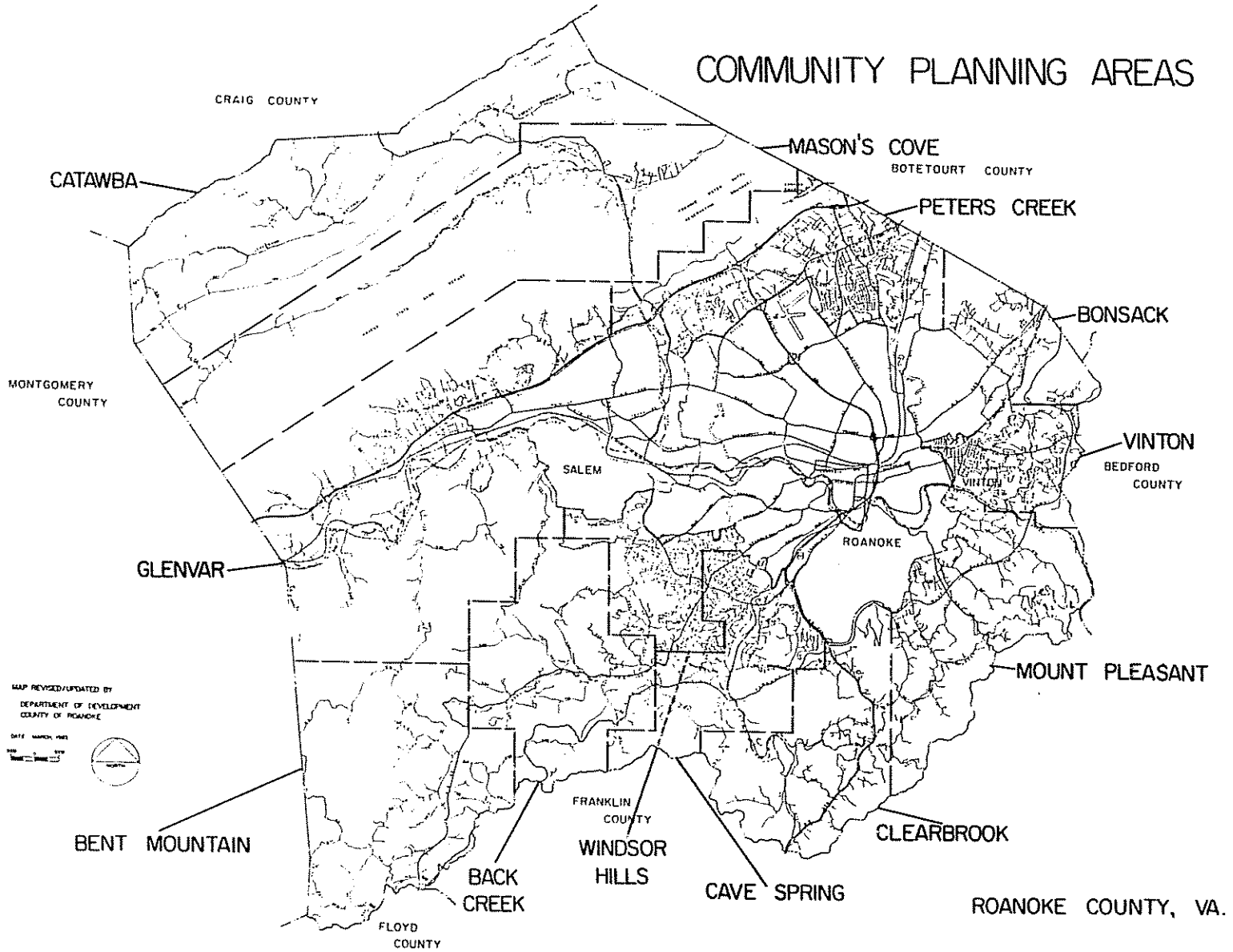

COMMUNITY PLANNING AREAS
CRAIG COUNTY
CATAWBA
MASON'S COVE
BOTETOURT COUNTY
PETERS CREEK
BONSACK
MONTGOMERY COUNTY
VINTON
BEDFORD COUNTY
SALEM
VINTON
ROANOKE
GLENVAR
MOUNT PLEASANT
MAP REVISED/UPDATED BY
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
FRANKLIN COUNTY
BENT MOUNTAIN
BACK CREEK
WINDSOR HILLS
CAVE SPRING
CLEARBROOK
FLOYD COUNTY
ROANOKE COUNTY, VA.

FIGURE 4-C

Community Planning Areas

Land Use and Housing Characteristics

The following two tables, **Land Use Characteristics** and **Housing Characteristics** describe in detail each of the twelve community planning areas.

Land Use Characteristics[1]

Community Planning Area	Total Land Area (Ac.)	Developed or Committed (Ac.)	Vacant or Agricultural (Ac.)	Suited for Future Development[2]
Back Creek	12,218	1,078	11,145	5,534
Bent Mountain	15,515	,547	14,977	7,417
Bonsack	4,558	,787	3,770	2,529
Catawba	23,650	4,612	19,039	11,415
Cave Spring	8,120	2,419	5,597	2,782
Clearbrook	10,105	1,128	8,981	3,697
Glenvar	28,430	3,556	24,881	9,588
Mason's Cove	26,836	9,171	17,653	7,147
Mt. Pleasant	10,720	1,310	9,413	6,207
Peters Creek	11,028	4,397	6,623	4,934
Vinton	2,479	,947	1,531	1,225
Windsor Hills	5,241	1,905	3,333	2,393
Total County	158,900	31,957	126,943	64,870*

1. Survey completed June 1, 1983.

2. Vacant land that does not exceed 20 percent slope and is not located within a flood hazard area.

* rounded by one acre

Source: Roanoke County, Department of Development

Housing Characteristics[1]

Community Planning Area	Single-Family Units			Multi-Family Units	Duplex Units	Mobile Homes	Institutional Group Housing Units	Total Housing Units
	Sound	Deterioriated	Dilapidated					
Back Creek	570	51	27	1	14	15	-	678
Bent Mountain	216	29	26	-	-	31	-	302
Bonsack	598	23	5	-	2	31	15	674
Catawba	197	32	22	-	-	20	215	486
Clearbrook	389	104	39	4	-	42	-	578
Glenvar	1881	293	71	11	12	120	256	2644
Mason's Cove	491	135	30	-	2	76	-	734
Mount Pleasant	996	147	24	21	20	193	-	1401
Peters Creek	4825	97	31	367	70	96	1094	6580
Vinton	1041	6	1	108	-	-	-	1156
Windsor Hills	3577	18	10	256	82	5		3948
Total	17,332	1,049	335	3,513	202	658	1,580	24,669

1. Survey completed June 1, 1983.

Source: Roanoke County, Department of Development

CHAPTER 5

ENVIRONMENTAL CHARACTERISTICS

ENVIRONMENTAL CHARACTERISTICS

A development suitability analysis of the natural environmental characteristics of Roanoke County was completed as a component of the Comprehensive Development Plan. The analysis identified those areas within the County that are the most intrinsically suited for future development. The identification process was based upon the concept of carrying capacity, i.e., that there are reasonable limits to the extent of growth certain areas of the County can absorb without endangering the public health or safety or damaging the natural environment. It is acknowledged that these limits to growth are not static and may be altered by technological advances, land use regulation, capital investment or changes in community attitudes.

The following section examines the ability of the land as defined by topography, soils, geological formations, climate, and vegetation to withstand and support the impacts of residential, commercial and industrial development, as well as recreational use and agricultural endeavors. The findings of these studies will be one of the basises for the future land use, major thoroughfare and community facilities plans presented later.

Topography

Roanoke County lies at the southern end of the Shenandoah Valley near the point of convergence of the Blue Ridge and the Allegheny mountain ranges. The County's topography ranges from 810 feet above sea level along the Roanoke River in the eastern portion of the County to 3928 feet above sea level atop Poor Mountain near the Roanoke County and Montgomery County border.

Slope

A slope analysis of the County's vacant or agricultural land was completed using the following four gradient classifications:

Flood Hazard Area -

Conditions unfavorable for residential, commercial, or industrial development.

Slopes range from 0 to 10 percent -

Conditions present few, if any, limitations to development.

Slopes range from 10 to 20 percent -

Conditions present moderate limitations to development.

Slopes exceed 20 percent -

Conditions present major limitations to development.

These slope designations represent the steepness of an area. For instance, a 10 percent slope means that the elevation of the land rises or falls 10 feet for every 100 feet of surface distance. Locations with slopes exceeding 20 percent pose particular development problems. Steep slopes are more vulnerable to erosion, invite increased runoff, and are basically unfit for most commercial and industrial development. Providing emergency and utility services becomes increasingly difficult. However, in keeping with appropriate design, soil, and climate considerations, steep-slope areas may be suitable for lower density residential uses. Generally, the type and intensity of steep-slope development will be directly proportional to the cost of the improvements required to maintain the public's safety.

Successful steep-slope development is dependent upon the effective execution of the building code and accompanying building permit system. Roanoke County utilizes strict site plan review procedures with respect to slope, drainage, soil erosion and sedimentation, and flood hazards. All building

projects proposed in Roanoke County which would disturb at least 10,000 square feet of land must meet all established regulations of the Virginia Erosion and Sediment Control Handbook, adopted by the Board of Supervisors and administered by the Department of Development and Department of Public Facilities.

Flood Hazard Zones

The periodic flooding of the Roanoke River and its many tributaries requires restrictions on the use of adjacent flood-prone land. To investigate the severity of flood hazards and to help administer the Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973, the Federal Insurance Administration of the U. S. Department of Housing and Urban Development requested that the U. S. Army, Corps of Engineers conduct detailed surveys of flood-prone areas.

In 1977, Roanoke County received a series of maps and flood profiles detailing selected segments of nineteen streams and approximating selected segments of three other streams. The streams studied by the detailed method were designated as those where the flood plain had been developed or was expected to be developed in the next five years. The streams studied by the approximate method were those with undeveloped flood plains. The result of the studies was the 1978 amendment of the flood plain restrictions of the Roanoke County Zoning Ordinance.

Streams Studied by Detailed Method

Roanoke River
Back Creek
Glade Creek
Glade Creek
Cook Creek
Tinker Creek
Carvin Creek
West Fork Carvin Creek
Ore Branch
Murray Run
Mudlick Creek
Mudlick Creek Tributary (Lower)
Mudlick Creek Tributary (Upper)
Peters Creek
Barnhardt Creek
Mason Creek
Jumping Run Creek
Dry Branch
Stypes Branch

Streams Studied by Approximate Method

Back Creek
Mason Creek
Bradshaw Creek

NOTE: The County would also benefit by the inclusion of Wolf Creek, Gum Spring Branch, and Catawba Creek in any further flood plain studies.

SOURCE: U. S. Department of Housing and Urban Development-

Federal Insurance Administration

The floodway is the stream channel plus any adjacent flood plain areas that must be kept free of intrusions that would cause the 100 year flood to rise more than one foot in height. The Federal Insurance Administration allows an increase in flood height of one foot provided that dangerous stream velocities are not also produced. (Note: A 100-year flood is a flood that, on the average, is likely to occur once every 100 years. A 100-year flood has a 1 percent chance of occurring in each year of a particular century, although the flood may actually occur in any year.)

The floodway fringe is the space between the floodway and the outer most boundary of the 100 year flood plain. The fringe includes that part of the flood plain which could be totally obstructed without increasing the water surface elevation of the 100 year flood more than one foot at any location (see Figure 5-A).

Slope Characteristics of Vacant or Agricultural Land

Approximately 80 percent, or 126,943 acres, of Roanoke County's total area of 158,900 acres is either vacant or used for agricultural purposes. The following table designates the amounts of vacant land or agricultural land according to slope classification.

Slope Characteristics of Vacant or Agricultural Land[1]

Slope Classification	Acreage
Flood Hazard Area	3,314.02
0 - 10%	32,054.01
10 - 20%	32,816.14
Exceeding 20%	58,758.83
Total	126,943.00

1. Slope conditions determined from U.S.G.S. topographic maps

Forty-nine percent of all vacant or agricultural land in Roanoke County is located in either flood hazard areas or in regions with slopes greater than 20 percent. Approximately 64,870 remaining acres are topographically feasible for development. It is important to note that vacant or agricultural land is not always potentially suitable for development. Ownership and land values play key roles along with the extent of existing public infrastructure as well as the natural environmental characteristics.

FLOODWAY SCHEMATIC

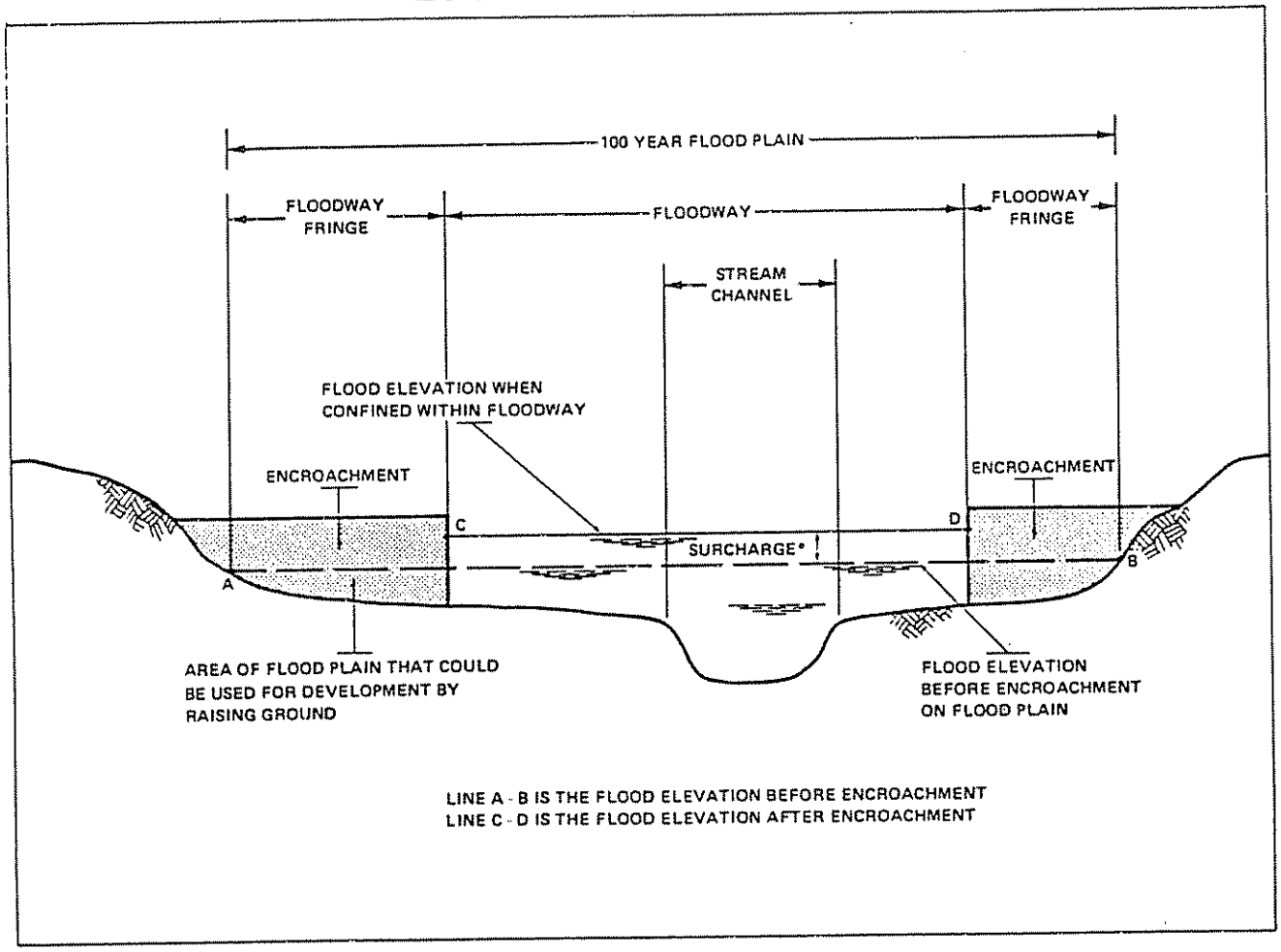


FIGURE 5-A

Roanoke County Drainage Basin Analysis

Degree of Slope - Vacant & Agricultural Land Acreage

ainage sin[1]	0-10%	10-20%	Over 20%	Flood Hazard	Developed or Committed Acreage[2]	Total Acreage
(Ore Branch)	148.33	116.28	200.00	-.-	549.58	1,014.69
(Murray Run)	199.73	65.58	32.79	-.-	438.01	736.11
(Mud Lick Creek)	1,161.42	659.90	765.49	52.79	1,919.41	4,559.01
(Barnhardt Creek)	161.01	218.51	770.55	-.-	311.98	1,462.05
	23.16	131.24	617.60	-.-	45.45	817.45
	27.81	22.25	228.06	-.-	28.93	307.05
	119.64	6.88	11.00	-.-	47.52	185.04
(Mill Creek)	201.68	123.25	201.68	33.61	64.05	624.27
	364.99	895.89	1,957.69	99.55	159.09	3,477.21
(Dry Branch)	647.93	518.34	1,943.78	129.58	107.44	3,347.07
	227.34	139.34	366.68	-.-	45.45	778.81
(Dry Hollow)	581.60	252.87	1,694.24	-.-	57.85	2,586.56
(Callahan Branch)	584.72	451.07	8.13	16.71	183.88	1,854.51
(Stypes Branch)	330.26	247.69	1,465.52	20.64	247.93	2,312.04
(Big Bear Rock Branch)	368.59	122.86	844.69	199.66	737.60	2,273.40
	261.89	135.46	442.51	63.21	758.26	1,661.33
(Horners Branch)	277.68	793.36	912.37	-.-	464.87	2,448.28
	70.42	45.27	115.69	20.12	41.32	292.82
	230.71	279.28	704.27	-.-	367.77	1,582.03
	158.07	13.02	14.88	-.-	70.25	256.22
(Mason Creek)	2,178.72	2,368.18	4,452.17	473.64	6,211.33	15,684.04
(Peters Creek)	931.91	579.86	538.44	20.71	975.20	3,046.12
B (Lick Run)	102.34	26.36	26.36	-.-	225.20	380.26
C (Tinker Creek)	3,134.47	887.11	1,478.52	413.99	5,097.07	11,011.16
D (Glade Creek)	1,571.21	533.62	563.26	296.46	787.18	3,751.73
E (Gum Spring Branch)	157.92	29.61	9.87	-.-	376.03	573.43
F	1,099.67	792.78	588.19	76.72	818.18	3,375.54
G	141.26	125.57	517.96	-.-	8.26	793.05

Roanoke County Drainage Basin Analysis

Degree of Slope - Vacant & Agricultural Land Acreage

Drainage Basin[1]	0-10%	10-20%	Over 20%	Flood Hazard	Developed or Committed Acreage[2]	Total Acreage
HH (Cove Hollow)	189.16	210.18	651.57	-.-	24.79	1,075.70
I	212.40	331.88	119.48	-.-	74.38	738.14
LL (Wolf Creek)	325.21	268.65	820.08	-.-	857.43	2,271.37
JJ	284.23	490.95	1,808.76	-.-	165.29	2,749.23
KK	308.59	220.42	205.73	-.-	86.78	821.52
Back Creek	6,666.26	9,999.39	15,332.40	1,333.25	4,811.95	38,143.25
Bradshaw Cr.	823.94	1,204.23	4,246.47	63.38	530.99	6,869.01
Catawba Cr.	2,136.23	3,649.40	3,115.34	-.-	2,411.14	11,312.11
North Fork Roanoke River	1,228.79	1,144.04	1,864.37	-.-	161.16	4,398.36
South Fork Roanoke River	3,601.99	3,473.34	5,788.90	-.-	477.27	13,341.50
Trout Creek	812.23	1,242.23	2,723.34	-.-	1,210.73	5,988.53
Total Acreages	32,054.0	32,816.14	58,758.83	3,314.02	31,957.00	158,900.00

1. Alphabetized drainage basin descriptions conform with desgintions assigned by Virginia State Water Control Board.
2. Developed or committed acreages do not include 9,550 acres designated by Roanoke County land use field survey completed June, 1983.

Source: Area calculations by Roanoke County, Department of Development

Drainage Areas

Roanoke County is drained by two of west central Virginia's largest rivers, the James River to the north, and the Roanoke River which flows west to east through the heart of the County. A drainage area or watershed, by definition, is one of a number of adjoining land masses which eventually drain into a specific watercourse. Consequently, the direction of surface water motion can be defined at any location in the County.

The direction of surface water flow also reveals the course that sewage will take in the absence of pump stations. The most practical sanitary sewer services are gravity flow systems which can be installed within individual drainage basins. A detailed analysis of each of the thirty-nine drainage basins in Roanoke County is presented in the table **Roanoke County Drainage Basin Analysis** and the map titled **Roanoke County Watersheds** (Figure 5B).

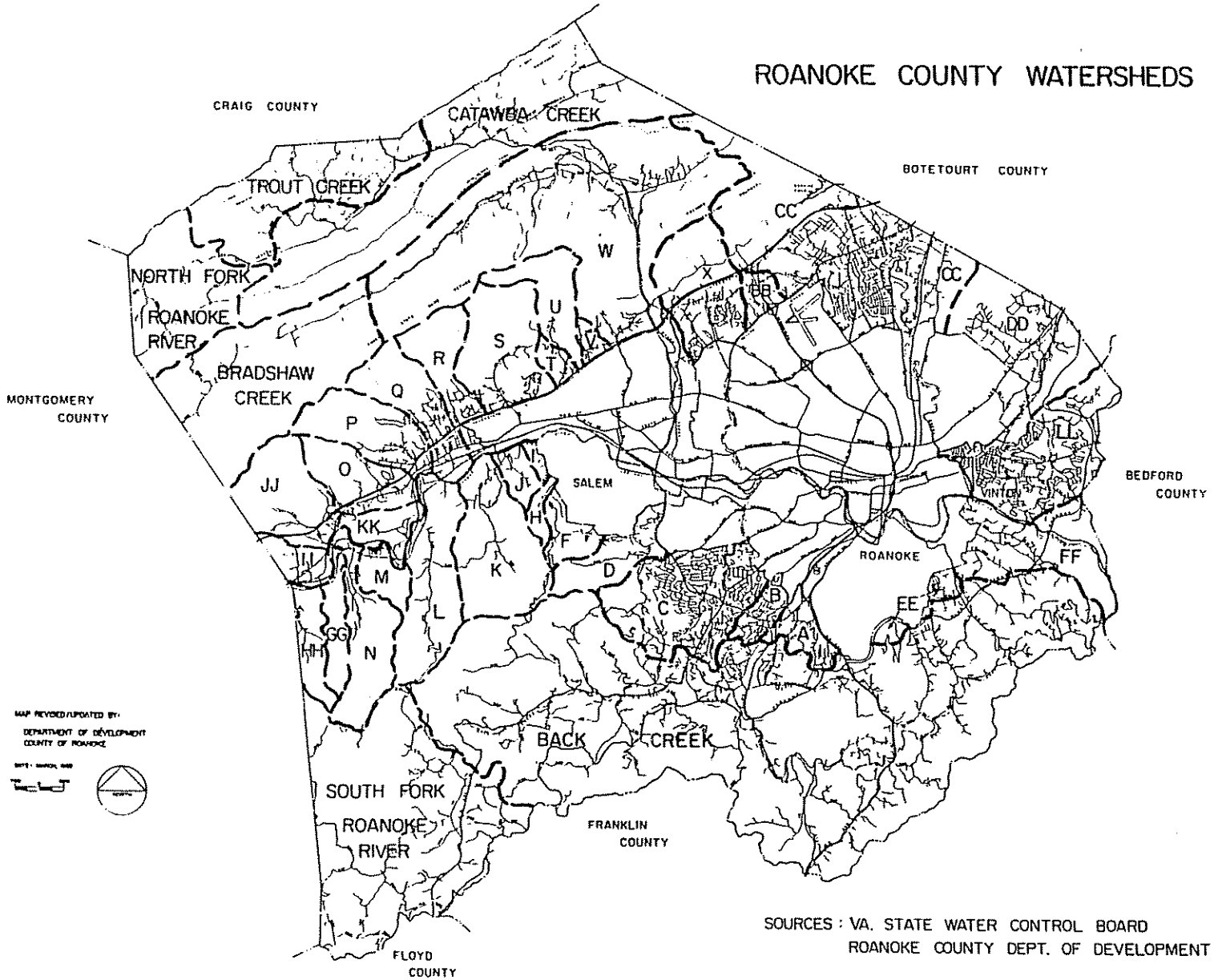

ROANOKE COUNTY WATERSHEDS
CRAIG COUNTY
CATAWBA CREEK
BOTETOURT COUNTY
TROUT CREEK
NORTH FORK
ROANOKE
RIVER
BRADSHAW
CREEK
MONTGOMERY
COUNTY
SALEM
VINTON
BEDFORD
COUNTY
ROANOKE
BACK
CREEK
SOUTH FORK
ROANOKE
RIVER
FRANKLIN
COUNTY
FLOYD
COUNTY
SOURCES : VA. STATE WATER CONTROL BOARD
ROANOKE COUNTY DEPT. OF DEVELOPMENT

FIGURE 5-B

Geology and Soils

Roanoke County is one of many western Virginia counties characterized by sharply differing geologic conditions. The Precambrian Age (Blue Ridge Complex) rock in the southeastern portion of the County is more than 600 million years old. The Mississippian and Devonian age rocks which underlie many of the northwestern parts of the County are approximately 400 million years old. Cambrian period rocks form the foundation for most of central Roanoke County. This period of geologic time has an average age of 550 million years. A narrow stretch of Silurian-Ordovician age rock (averaging 450 million years old) partially surrounds the Cambrian foundation although it yields to even thinner tracts of Cambrian, Silurian, and Mississippian age rock bordering Craig County. The following table depicts the importance of geologic time in Roanoke County in terms of the different rocks formed and the products that can be derived from these formations.

ROCK SYSTEM	ROCKS FORMED	PRODUCTS FOUND OR MANUFACTURED
Mississippian-Devonian	Sandstone, Shale, Limestone, Gypsum Coal	Coal, Coke, Sand, Gypsum, Shale, Cement, Salt Brine, Natural Gas
Silurian-Ordovician	Limestone, Dolomite, Shale, Sandstone	Lime, Crushed Stone, Cement, Shale, Petroleum
Cambrian	Dolomite, Limestone, Shale, Sandstone	Crushed Stone, Sand, Zinc, Lead, Shale
Precambrian	Granite, Gneiss	Crushed Stone

SOURCE: Virginia Department of Conservation and Economic Development, Division of Mineral Resources

The value of nonfuel mineral production in the County slipped from $5,437,000 in 1979 to $4,409,000 in 1980.[1] It is expected that 1981 and 1982 figures will reflect even further the decline of the local mineral industry.

Considerable faulting and folding has added to the complicated nature of Roanoke County geology. A fold is a rock layer pressured into an arch, a basin, or a terrace. A fault is a break in rock strata that causes a section to be dislocated along the line of fracture. Three major geologic faults occur in Roanoke County. The Miller Fault lies in the extreme northwest corner of the County, the Salem Fault occurs parallel to and just north of Interstate 81 as it cuts an east-west line across the County, and the Blue Ridge Fault forms the barrier between Precambrian and Cambrian age rocks in southern Roanoke County (see Figure 5-C).

The soils overlying these rock strata will affect development. Some soil characteristics may lead to cost overruns not evident at the outset of a project. Unexpectedly deep water tables or bedrock levels are examples of undesirable characteristics. Soil subsidence and eventual structural failure can result if building occurs on unstable ground.

The upcoming completion of a new County soil survey will give substance to the existing development code. The survey is expected to be available in 1985 or 1986. Until then a general soil association analysis of the County, completed by the Soil Conservation Service and Virginia Polytechnic Institute, will be relied on.

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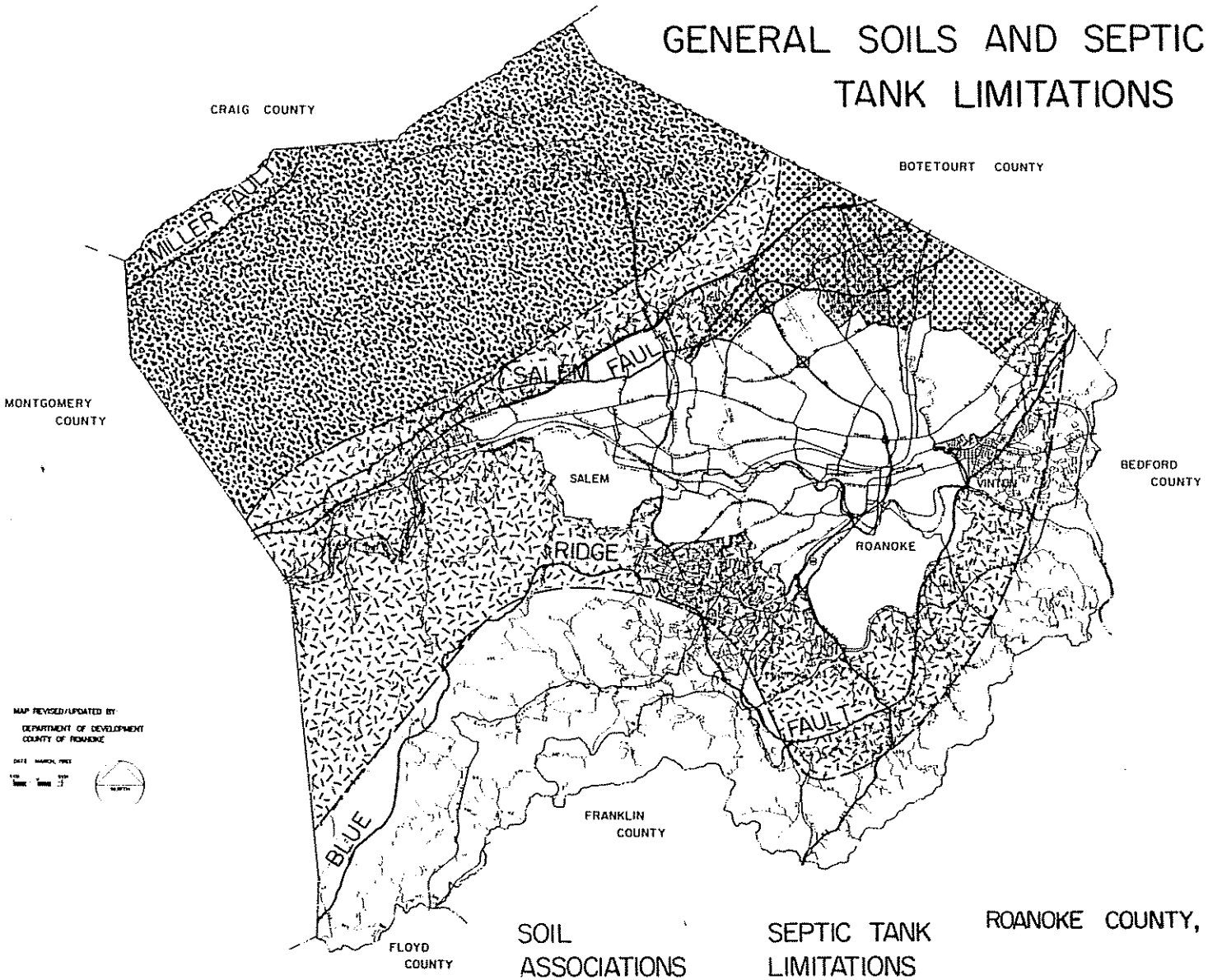
1. The Mineral Industry of Virginia, 1982.

GENERAL SOILS AND SEPTIC TANK LIMITATIONS



ROANOKE COUNTY, VA.

SOIL ASSOCIATIONS	SEPTIC TANK LIMITATIONS
DEKALB-BERKS-WEIK'T.	SEVERE
FREDERICK-LODI	MODERATE TO SEVERE
RAMSEY-BERKS	SEVERE
CHESTER-HAYESFIELD	SLIGHT TO MODERATE

FIGURE 5-C

There are four general soil types in Roanoke County. The septic suitability of each type has been defined as being either severely limited, moderately to severely limited, or moderately to slightly limited. Virtually all of the western and northern portions of the County have been classified as severely limited for septic tanks. Only several relatively small sections in the southern and eastern parts of the County have been designated as having moderate to slight septic limitations. These general soil associations are described more fully in the following table and by Figure 5-C.

GENERAL SOILS AND SEPTIC TANK LIMITATIONS

Soil Association	Septic Tank Limitations[1]	Portion of the County
Dekalb-Berks-Weikert	Severe	North and Northwest
Frederick-Lodi (Outcrop)	Moderate to Severe	Northeast
Ramsey-Berks	Severe	West
Chester-Hayesville	Slight to Moderate	Southwest, South and East

1 Efficient absorption may vary according to specific site analysis

SOURCE: Soil Conservation Service and Virginia Polytechnic Institute

Soil Erosion and Sediment Control

In 1980 the Virginia Soil and Water Conservation Commission established new minimum state guidelines for the control of soil erosion and sedimentation or ground disturbing activities. Roanoke County has legally adopted these guidelines. An earlier set of state standards was published in 1974 as a basis for local sediment control programs across Virginia. The major purpose of the

1980 guidelines is to upgrade the effectiveness of already existing local and state controls.

Minimum statewide guidelines now require that the following measures be taken when and where applicable: 1) stabilization of denuded areas and soil stockpiles; 2) establishment of permanent vegetation; 3) protection of adjacent properties: 4) timing and stabilization of sediment trapping measures; 5) construction of proper sediment basins; 6) preparation of properly designed cut and fill slopes; 7) implementation of effective stormwater management practices; 8) stabilization of waterways and outlets; 9) protection of storm sewer inlets; 10) stabilization of the main channel when working in or crossing watercourses; 11) correct installation of underground utilities; 12) completion of satisfactory construction access routes; 13) completion of temporary erosion and sediment control measures; and, 14) maintenance of all temporary and permanent erosion control devices. An in-depth discussion of all the preceding requirements may be found in Chapter 3 of the Virginia Erosion and Sediment Control Handbook.

Stormwater Management

Rainfall which does not evaporate or is not absorbed into the ground for vegetative purposes moves through natural channels into larger water bodies (rivers, lakes, etc.) and is commonly called runoff. If a particular area is developed, its natural stormwater system is affected. As roads and buildings are constructed, there exists less land capable of absorbing precipitation. More water is added to that which must already be received by the natural drainage system. Thus, urbanizing areas often require the construction of stormwater facilities to make up for the loss of natural surface drainage.

The Virginia Soil and Water Conservation Commission established two objectives for developing statewide stormwater control criteria: 1) the standards must be aimed largely at the management of off-site erosion and sedimentation; and 2) the standards must have enough flexibility to permit innovative solutions to local stormwater management problems. Roanoke County's storm drainage management goals can best be accomplished by flood control, off-site erosion control, and nonpoint source pollution control.

Flood Control

Primary drainage and major drainage systems serve as the focal points for flood control strategy.

Street gutters and ditches, storm sewers, culverts and open channels constitute the primary drainage system. Since many existing primary systems were not adequately designed to accommodate increased runoff from future development, frequent minor flooding and property damage occurs downstream. The optimum solution is to control runoff by using stormwater detention facilities. These facilities may be either on-site ponds or more sophisticated off-site facilities capable of controlling runoff resulting from an entire drainage basin. (Both options will be explained further in the Community Facilities Plan, Volume 4 of the Comprehensive Development Plan.) Extensive modifications of the existing elements in the primary drainage system may be the only strategy for handling current inadequacies.

The major drainage system accommodates stormwater exceeding primary system capacities. This system includes flood plains and surface flow courses followed by runoff which results from major storms. The optimum strategy for controlling such large-scale flooding is to minimize major property damage or loss of life by planning and protecting stormwater drainage routes to be utilized

during periods of heavy flooding. The Future Land Use Plan will provide for these drainage corridors.

Erosion Control

Off-site erosion control is generally accomplished by proper study and subsequent implementation of measures designed to handle a two-year storm. Most natural stream channels have a bank-full capacity to contain runoff resulting from a two-year storm. However, as upstream development takes place, the volume and velocity of flow from such storms rise. To avoid the formation of straight, wide, sediment laden channels with almost vertical banks, the development near any stream should be very carefully monitored. Channelization should be utilized only as a last resort.

Nonpoint Source Pollution

Nonpoint source pollution occurs when pollutants are swept from the land surface into water bodies by stormwater runoff. Nonpoint source pollutants are important contributors to diminished water quality. The quality of water in those drainage areas feeding recreation reservoirs and public water supplies is especially important. The Future Land Use Plan will contain policies and programs designed to protect the surface water quality in all watersheds.

Further details describing flood control, erosion control, and nonpoint source pollution control may be found in the Virginia Erosion and Sediment Control Handbook.

Groundwater

Two-thirds of the County's potable water supplies are furnished by the Roanoke River and Carvins Cove Reservoir. Groundwater supplies furnish the

remaining one-third, according to the 1976 planning bulletin Roanoke County Groundwater-Present Conditions and Prospects.

Groundwater quality is normally determined by detailed analyses of the following factors: 1) hardness; 2) hydrogen ion concentration (ph); 3) total dissolved solids; 4) iron content; 5) manganese content; 6) chloride content; 7) sulfate levels; and, 8) nitrate levels. In general, groundwater quality throughout the County is good, although high hardness values do occur.

Roanoke County could realize a substantial economic return by taking advantage of the considerably lower development and treatment costs associated with groundwater as compared to those of surface water. The County's potential for further groundwater development is very good. Roanoke County Groundwater-Present Conditions and Prospects has estimated that a safe yield of an additional 50 to 60 million gallons per day could be withdrawn under a properly managed program with minimal effects on aquifer systems.

Climate

Roanoke has a mild climate which results from its geographic setting and physiographic characteristics. Tropical storms approaching from the south generally lose most of their potentially devastating effects before reaching the County's inland location. The Allegheny Mountains to the west act as a moderating buffer from winter cold and wind.

The County's growing season lasts approximately 190 days. The latest spring freeze usually occurs in mid-April and the first autumn freeze commonly arrives in late October.

National Climatic Center figures indicate a mean average temperature of thirty-six degrees in January and seventy-five degrees in July. The annual average daily temperature is fifty-six degrees coupled with an annual average

daily wind speed of eight miles per hour. Winter winds are predominantly out of the northwest and summer winds originate in the south or southeast. The area's average annual precipitation total is thirty-nine inches. Approximately twenty-four inches of snow falls each year.

Local, regional and national increases in the cost of heating buildings have spurred interest in measuring "heating degree days." As degree-day units per day increase, heating requirements also increase. The heating industry uses a sixty-five degree base as its standard assuming that if the outside temperature is sixty-five degrees or less heat is necessary inside a building for comfort. Degree-day units for a specific day are determined by subtracting that day's mean average temperature from sixty-five degrees. The result equals the number of degree-day units for that day. The normal number of calendar heat degree-day units for the Roanoke area is nine units per day per annum.

The table, **Roanoke Metropolitian Area Climatic Conditions 1949-1979**, describes these data more fully.

Roanoke Metropolitan Area
Climatic Conditions 1949-1979

Month	Average Precipitation[1]	Snow	Normal Daily Temperatures (F°) Minimum	Maximum	Mean	Average Wind Speed (MPH)
Jan.	2.74	6.6	27.2	45.6	36.4	9.8
Feb.	3.09	7.1	28.3	47.9	38.1	10.3
Mar.	3.33	4.0	34.3	56.3	45.3	10.5
Apr.	2.80	.3	43.9	67.9	55.9	10.1
May	3.47	trace	52.7	76.1	64.4	8.1
June	3.51	0	60.4	83.0	71.7	7.1
July	3.74	0	64.4	85.9	75.2	6.7
Aug.	4.15	0	63.3	84.9	74.1	6.3
Sept.	3.42	trace	56.5	79.5	68.0	6.3
Oct.	3.19	trace	45.6	69.9	57.8	7.1
Nov.	2.48	1.9	35.8	57.6	46.7	8.7
Dec.	3.11	4.4	28.1	46.6	37.4	9.1
Annual	39.03	24.3	45.0	66.0	55.9	8.3

[1] Includes snowfall

SOURCE: National Oceanic and Atmospheric Administration, Local Climatological Data: Roanoke, Virginia, U. S. Department of Commerce, 1949-1979.

Forests

Approximately 72 percent of Roanoke County's total land area, or 114,748 acres is in forest land. Of this acreage, all but 583 acres are commercial forest. The balance are productive reserved forest. Hardwoods (oak, hickory) comprise 70 percent of the County's forests. Softwoods (mostly white pine and southern yellow pine) account for 22 percent of County timber and a combination of oak-pine forests make up the remaining 8 percent.

Private individuals, farmers and corporations own 95,103 acres of County forests, forest industries hold 8,066 acres and County and other local governments own 5,880 acres. The Commonwealth of Virginia owns 4,204 acres, the U. S. Department of Interior-Jefferson National Forest holds 589 acres and Federal ownership accounts for fifty-three acres.

Roanoke County incurred a net loss of 900 acres of forest land from 1966 to 1977. As more land is acquired for subdivisions, shopping centers, businesses and other types of uses, the amount of forested acres will continue to decrease. The long-term effects of development on the County's forest resources must be carefully evaluated. Balanced ecological relationships demand trees, shrubs and other vegetation. Soil erosion control, water conservation, air purification, and noise abatement all require a minimum amount of trees and shrubs. The future land use policies pertaining to Roanoke County's forests must recognize the separate needs of recreation, timber production, and watershed and wildlife protection.

Air Pollution

Roanoke County empowers its own air pollution control division to measure and monitor air quality. In order to avoid financial penalties and industrial growth limitations, the County must meet U. S. Environmental Protection Agency standards for different pollutants. County personnel inspect industries, businesses, and residences which may be emitting unlawful levels of air contaminants. Presently, the County's air quality code allows burning by permit only in rural regions (those which are zoned agriculture and residential estates). Semi-annual source inspections are conducted along with routine patrols to help deal with pollution problems.

Airborne contaminants are measured at the Salem Civic Center and at East Vinton Elementary School. At these stations, ozone, carbon monoxide, sulfur dioxide, nitrogen oxide, and nitrogen dioxide levels are continuously monitored and recorded. This information determines the daily air pollution index. Once every six days, dust or particulate matter is collected and measured at Clearbrook, Salem, Starkey, Vinton, and Woodrum Field. County staff members manage all monitoring, inspections, health education, permits, patrols and any other responsibilities required by the air pollution code. (Roanoke County's Air Pollution Office is funded by the U. S. Environmental Protection Agency, the City of Salem, Roanoke County, and the County's Health Department through provisions of the Commonwealth of Virginia.) A more detailed discussion of all facets of air quality and control in the County may be found in the Roanoke County Air Pollution Control Ordinance.

Wildlife

Wildlife must have food, water, shelter or cover, living space, air, and sunlight to survive. Year-round wildlife residents must have a continuous food supply available. Migrating birds have only seasonal food requirements. Clean, unpolluted water must be provided. Animals feeding on water or obtaining protection on water have extra requirements. The importance of shelter or cover for nesting and reproduction, for escape from enemies, and for protection from the elements must be offered in sufficient quantities and close to food and water.

Land management practices beneficial to wildlife populations include: controlled burning, food-patch planting, mowing or using herbicides to weed out woody plants in low-growing grass areas, seeding grasses and legumes, planting trees and shrubs, and managing water. One practice especially good for wildlife is known as even-aged forest management. This management method calls for growing, harvesting, and reproducing trees in stands that are approximately the same age. The advantages offered to wildlife by even-aged management are many. A greater variety of cover conditions which range from areas recently opened up by logging to the more mature timber stands provide various kinds of food and shelter required by many species of game birds and animals. Game birds feed off insects, berries and buds in the newly cleared openings. Deer make use of heavy growth areas as well as newly cleared areas. In mature timber stands, squirrels, turkey, and bear consume the many fruits and nuts offered. Even-aged management through selected burning practices encourages more deer, grouse, quail, doves, rabbits and songbirds, as well as improved deer, turkey, and quail habitats. These enhancement principles are well documented and used within the Jefferson

National Forest; however, more of these sound wildlife management practices need to be implemented in Roanoke County's privately-owned woodlands.

The Roanoke River, Tinker Creek, and Glade Creek provide local fishermen with less than adequate trout fishing, certainly not of the quality found in some of Virginia's more rural areas. These areas generally offer cleaner water, more forbidding terrain, but support fewer fishermen than streams in the Roanoke Metropolitan Area. The Roanoke River east of the Roanoke City limits offers such fish as small and largemouth bass, striped bass, crappie, perch and pike, as well as trout. The variety of fish found in the Roanoke River west of Salem is not as attractive. Other than seasonal catches of rainbow and brook trout, few species of desirable game fish are caught.

Since most of the County's forests, streams, and grasslands are under private ownership, the quality of wildlife and wildlife habitat is largely determined by the care exercised by these individuals and corporations. The future of wildlife and its use and enjoyment by generations to come depends upon the extent to which careful environmental management methods are employed by today's landowner in Roanoke County.

CHAPTER 6

TRANSPORTATION

TRANSPORTATION

Orientation

Roanoke County, which is served by Interstates 81 and 581 and several U. S. primary routes, is approximately 180 miles west of Richmond; 200 miles southwest of Washington, D. C.; 250 miles west of the port of Hampton Roads; and 100 miles north of Greensboro, North Carolina. The Roanoke area is approximately midway between New York City and Atlanta.

Existing Transportation Planning Process

Roanoke County is a participant in the Comprehensive, Continuing, Cooperative (3-C) Transportation Planning Process required by the 1962 Federal Highway Act of all urban areas with populations exceeding 50,000 persons. The cities of Roanoke and Salem as well as Botetourt County are also participants in this metropolitan planning process.

The regional Transportation Improvement Program (TIP) is a three year multi-modal implementation plan which summarizes anticipated expenditures for primary route improvements and construction in the metropolitan area. The TIP is an annual end product of the 3-C planning process. The capital projects contained within the TIP are those which were included within the Six Year Improvement Programs for Interstate, Primary, Urban, and Secondary Systems and Public Transit as well as the Roanoke Valley Area 1975-1995 Transportation Plan. The former document is produced annually by the Virginia Department of Highways and Transportation and supplemented biannually by a priority listing of secondary routes scheduled for improvement by the VDH&T, as negotiated with the Board of Supervisors. The long-range planning document, also produced by VDH&T, is updated every five years (see Figure 6-A).

TRANSPORTATION PLANNING PROCESS

Roanoke County

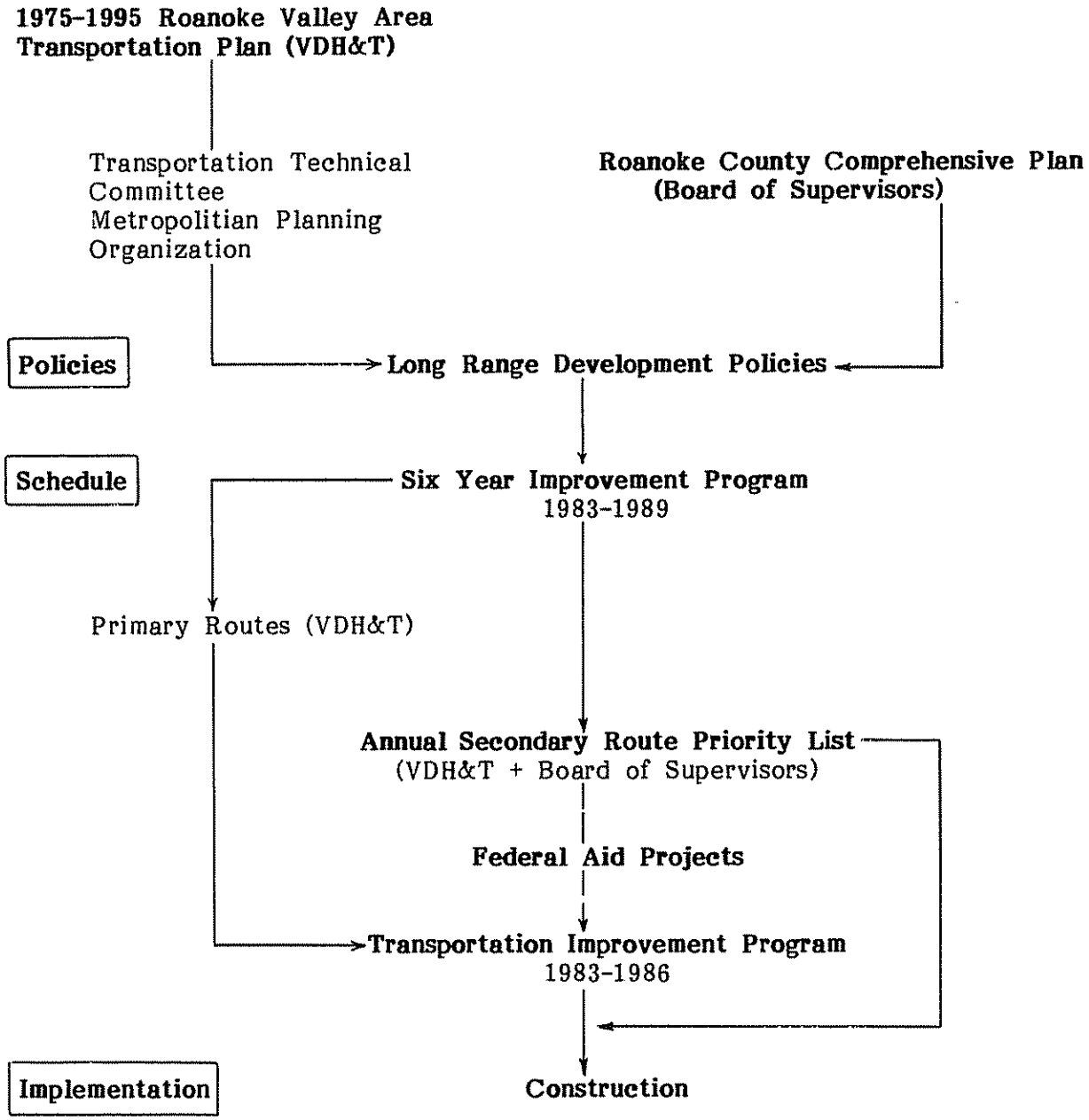


Figure 6-A

The TIP, as a prerequisite for the receipt of federal funding, is adopted only after a careful review by the area Transportation Technical Committee (TTC) and the Metropolitan Planning Organization (MPO). Both of these bodies are composed of individuals representing the local jurisdictions, the VDH&T, and the Federal Highway Administration.

The Six Year Plan for Primary Routes, upon which much of the TIP is founded, is adopted only after a series of statewide public hearings have been conducted. The priority listing and funding allocations for secondary route improvements are finalized after local meetings between the VDH&T and the County Board of Supervisors have been completed. The long-range area transportation plan is adopted by each jurisdiction after a local public hearing.

The following pages will define and describe the existing transportation system within Roanoke County and the metropolitan area. Transportation goals, objectives, standards, and developmental policies are discussed in Volume 3 of the Comprehensive Development Plan.

Highways

Interstate 81 (north - south) bisects Roanoke County, approximately paralleling and lying contiguous with the northern corporate boundaries of the cities of Roanoke and Salem. This major highway connects the Roanoke area with the market areas to the north, south, east, and west. Interstate 581 (north - south) connects Interstate 81 with U. S. Route 220 and serves as the expressway link to downtown Roanoke. U. S. Route 11 (north - south) and 460 (east - west) intersect in Roanoke. U. S. Routes 220 (north - south) and Interstate 581 converge at the southern corporate limits of Roanoke. U. S. Route 220 is the primary route between the Roanoke area and the Greensboro, High Point, Winston-Salem, North Carolina area. U. S. Route 221 (north - south)

originates in Lynchburg and proceeds south through Roanoke County into North Carolina. Virginia primary highway numbers 24, 112, 115, 116, 117, 311, and 419 serve to inter-connect Salem and Roanoke with the interstate highways. The transportation map on the following page indicates approximate highway mileage from the intersection of Interstates 81 and 581 to important market areas within and outside of Virginia (see Figure 6-B).

Elements of an Intraurban Highway System

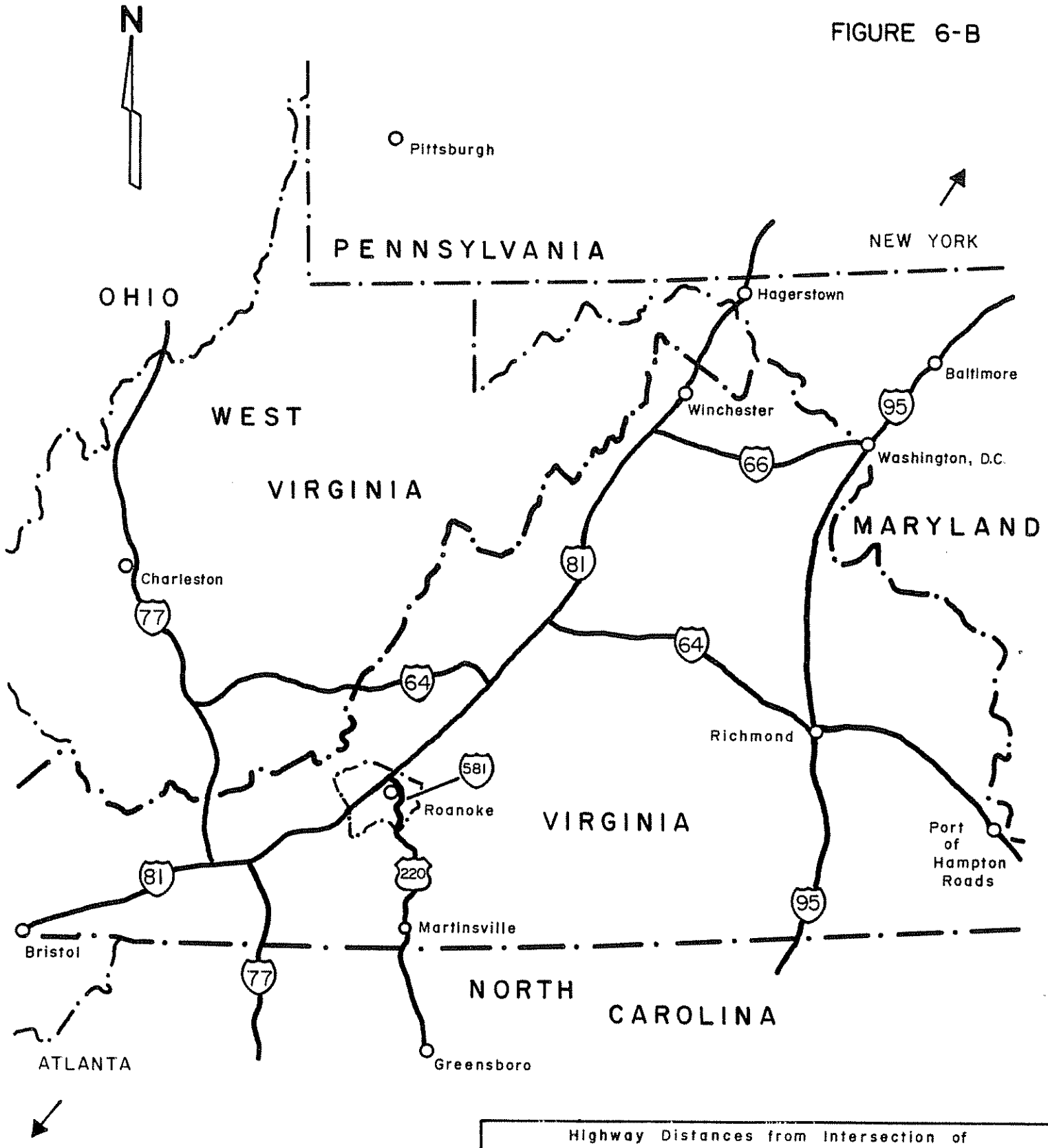
There are two primary elements of an intraurban highway system, the travel way and the vehicle.

The travel way consists of the permanent pathways over which circulation takes place. The travel way is a major structural element of the urban community, occupying up to 30 percent of the total land area (in Roanoke County, travel ways comprise 11 percent of the total developed land area). The shape of the travel way controls the shape of blocks and thus the lots within them. The quality of the travel way influences the volume and orientation of travel within an urbanized area, and indirectly impacts the economic well-being of the area.

The vehicular element consists of automobiles, mass transit, and para-transit vehicles. Automobiles account for 85 to 90 percent of the total travel on expressways, arterials, and local streets. Trucks account for most of the remainder. The type and extent of mass transit service offered to an urban area is determined by the density, physical characteristics, and economic climate of that area. Para-transit vehicles are generally "hire and drive" (rental cars), "hail or phone" (taxi, dial-a-ride, jitney services), or "prearranged ride sharing" (car or van pools and subscription bus services).

MAJOR HIGHWAY SYSTEMS

FIGURE 6-B



SCALE

1 inch = 40 miles (approx.)

Highway Distances from Intersection of Interstates 81 and 581			
Richmond, VA	180	Greensboro, NC	100
Washington, D.C.	200	Atlanta, GA	400
Port of Hampton Rds.	250	Cincinnati, OH	540
Pittsburgh, PA	340	New York City	500

Functional Highway Classification System

Streets are classified according to functional purpose and volume of traffic. The National Committee on Urban Transportation recommends the following four categories: expressway, arterial, collector, and local.

1. Expressway

Expressway highways serve large volumes of traffic and provide virtually no access to adjacent land uses. Expressway traffic generally moves quickly and travels long distances. Expressways are major barriers which separate land uses. Interstates 81 and 581 are examples of expressways.

2. Arterial

Arterial highways carry traffic to and from expressways and assist in moving traffic through areas not served by expressways. Arterials are intended to provide limited access to adjacent land uses, as well as to provide open space corridors and utility easements. Generally, arterials connect major traffic generators within a community with different neighborhoods. Major traffic generators within the Roanoke SMSA include Community Hospital, Roanoke Memorial Hospital, Lewis Gale Hospital, Towers Mall, Crossroads Mall, Tanglewood Mall, Lake Drive Plaza, Lee-High Shopping Center, Virginia Western Community College, and the Veteran's Administration Hospital. Average trip length along an arterial route generally exceeds one mile in length. U. S. 11, 220, 221, and 460 as well as Virginia Routes 24, 115, 116, 117, 118, 311, and 419 are are arterial highways.

3. Collector

Collector streets are intended to move traffic within a section of the community and generally connect with the arterial system. Collector streets are generally not used for long trips, do serve adjacent properties, and also function as utility easements. Routes such as 780 (Cove Road), 629 (Green Ridge Road), 623 (Dent Road), 601 (Old Hollins Road), 651 (Mountain View

Drive), 940 (Starkey Road), and 800 (Chapparal Drive) are examples of collector streets within Roanoke County.

4. Local

The primary purpose of a local street is to provide access to adjacent residential, commercial, industrial, and public land uses. Local streets also allow for utility easements and open space corridors. The pattern of local streets is very important in determining the functional and aesthetic quality of residential subdivision design. The local street system in Roanoke County comprises the largest percentage of the total highway mileage.

VDH&T Classification Plan

The Virginia Department of Highways and Transportation classifies the roads within Roanoke County as either primary or secondary. Primary routes (routes numbered 1 - 599) are established by meeting five of the following nine criteria:

1. Constitutes a link in interstate or intrastate highways.
2. Serves a place of great historic or scenic interest.
3. Connects county seats.
4. Carries a minimum of 750 vehicles per day.
5. Carries a minimum of 7 percent foreign vehicles.
6. Carries a minimum of 20 percent light and medium trucks.
7. Carries a minimum of 2 percent tractor-trailers and buses.
8. 20 percent of the traffic has a destination of twenty-five miles or more.
9. 5 percent of the traffic has a destination of 100 miles or more.

All primary routes within the County function as arterials. Secondary routes (routes numbered 600 - and above) do not meet the aforementioned

criteria. Most of these streets function as either collector or local streets. However, classification as a secondary route by the VDH&T does not necessarily exclude a travel way from functioning as an arterial. The following table summarizes the evolution of primary and secondary roads in the County from July, 1932, through December, 1980.

Total Primary and Secondary Road Mileages, 1932 - 1980

Type	7/32	7/34	7/41	12/50
Bit. Sur. Paved	74.97	91.78	197.90	208.44
Gravel, Soil, Etc.	217.54	183.93	149.26	46.24
Graded & Drained	9.88	15.61	3.27	84.33
Unimproved	27.83	26.04	8.17	10.17
TOTAL MILEAGE	330.22	317.36	358.60	349.18

Type	12/60	12/70	12/75	12/78[1]	12/80
Hard Surface	365.96	444.69	481.92	420.53	438.07
All Weather Surface	49.63	47.18	36.39	35.81	33.02
Light Surface	13.90	2.51	3.62	3.52	0.16
Unsurfaced	1.21	0.98	0.52	0.82	0.10
TOTAL MILEAGE	430.70	495.36	522.45	460.68	471.35

1. Accounts for annexation of 15.84 square miles by Roanoke City in 1976.

Source: Virginia Department of Highways and Transportation

Highway Traffic Volumes

Traffic volumes are measured by the Virginia Department of Highways and Transportation and are expressed as either average daily traffic or design hourly volume.

Average daily traffic (ADT) is the total volume of traffic measured for a specific time period, divided by the number of days in that time period. VDH&T generally measures traffic volume at a specific location for three to five days to determine ADT.

Design hourly volume represents the peak-hour traffic volume which may be expected during any twenty-four hour period. Design hourly volume is usually determined by dividing ADT by ten.

Figures for ADT and design hourly volume are most meaningful when compared to the capacity or service volume of a specific highway. Capacity is the maximum number of vehicles that can travel over a given section of highway during a specified time period while operating conditions are maintained at a desired service level. VDH&T design capacities are given in vehicles per hour.

Service level is one of the primary determinant of roadway capacity. The Virginia Department of Highways and Transportation defines service level as the grading or ranking of a roadway segment or intersection based on its operating conditions. These operating conditions are based on a scale that ranges from a "level of service A" (free flow) to a "level of service E" (forced flow). A "level of service C" is midway at the point of critical density. Capacity will vary, depending upon the desired level of service. The table, **Level of Service Characteristics,** and Figure 6-C, **Speed-Volume Relationships** further define the concepts of capacity and level of service.

The desired service level within Roanoke County has been established by VDH&T as the "B level," a stable flow where speeds and maneuverability are not unreasonably restricted by higher volumes of traffic. Generally, drivers are able to maintain an average operating speed of twenty-five miles per hour

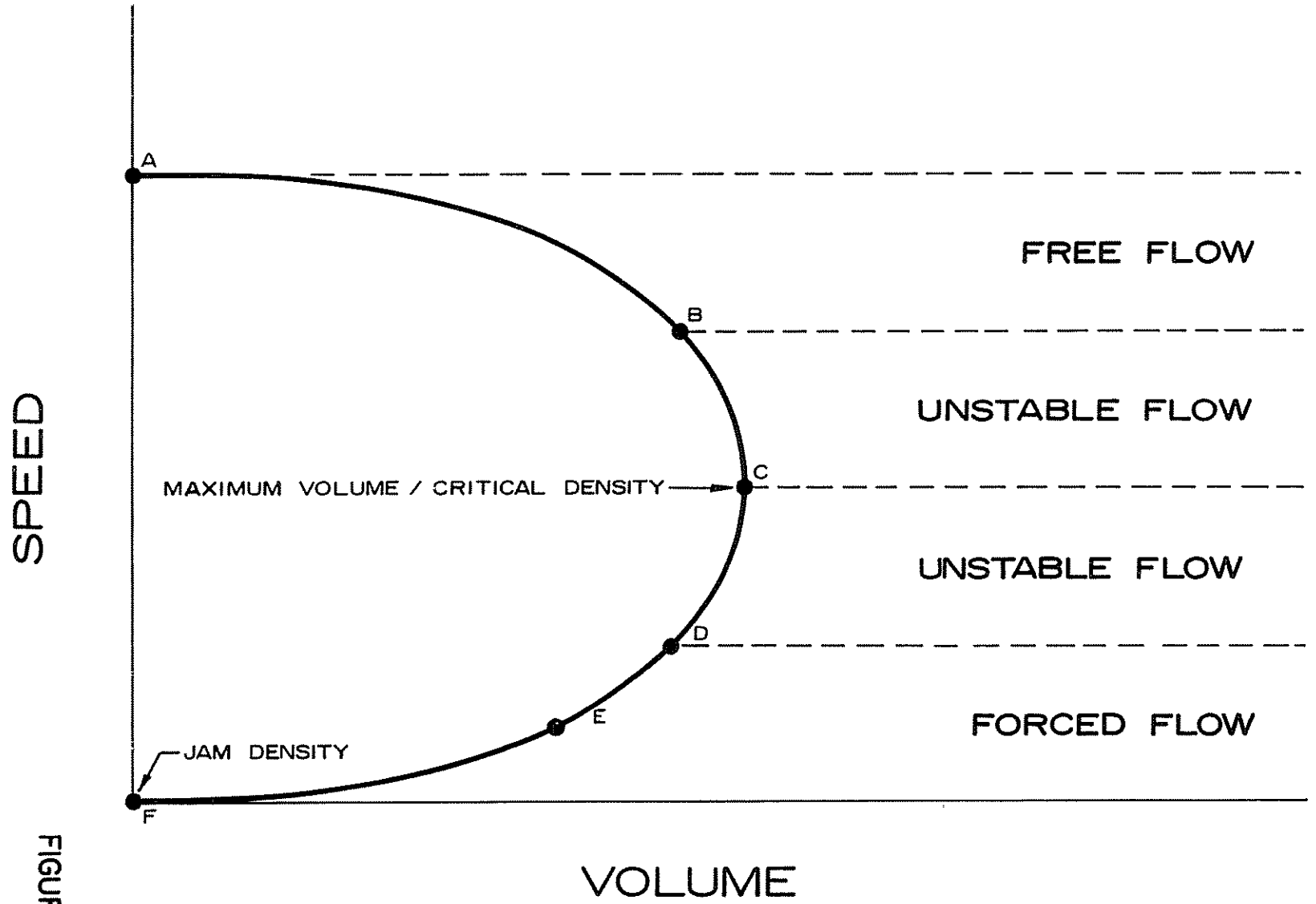


FIGURE 6-C

SPEED - VOLUME RELATIONSHIP

LEVEL OF SERVICE CHARACTERISTICS

Level of Service	Urban and Suburban Aeterials	Controlled Acces Highways
A	Average over-all travel speed of 30 mph or more. Free flowing with volume/capacity ratio of 0.60. Load factor at intersections near the limit of the 0.0 range. Peak-hour factor at about 0.70.	Free flow. Operating speeds at or greater than 60 mph.
B	Average over-all speeds drop due to intersection delay and inter-vehicular conflicts, but remain at 25 mph or above. Delay is not unreasonable. Volumes at 0.70 of capacity and peak-hour factor approximately 0.80. Load factor at intersections approximately 0.1.	Higher speed range of stable flow. Operating speed at or greater than 55 mph.
C	Service volumes about 0.80 of capacity. Average over-all travel speeds of 20 mph. Operating conditions at most intersections approximately load factor of 0.3. Peak hour factor approximately 0.85. Traffic flow still stable with acceptable delays.	Operation still stable, but becoming more critical. Operating speed of 50 mh and service flow on two-lanes in one direction at 75 percent of capacity.
D	Beginning to tax capabilities of street section. Approaching unstable flow. Service volumes approach 0.90 of capacity. Average over-all speeds down to 15 mph. Delays at intersections may become extensive with some cars waiting two or more cycles. Peak hour factor approximately 0.90; load factor of 0.7.	Lower speed range of stable flow. Operation approaches instability and is susceptible to changing conditions. Operating speeds approximately 40 mph and service flow rates at 90 percent of capacity.
E	Service volumes at capacity. Average over-all traffic variable, but in area of 15 mph. Unstable flow. Continuous back-up on approaches to interesections. Load factor at intersections in range between 0.7 and 1.0. Peak hour factor likely to be 0.95.	Unstable flow. Over-all operating speeds of 30-35 mph. Volumes t capacity or about 2,000 vph lane under ideal conditions. Traffic flow metered by design constrictions and bottlenecks, but long back-ups do normally develop upstream.
F	Forced flow. Average over-all traffic speed below 15 mph. All intersections handling traffic in excess of capacity with storage distributed throughout the section. Vehicular back-ups extend back from signalized intersections, through unsignalized intersections.	Forced flow. Freeway acts as a storage for vehicles backed-up from downstream bottleneck. Operating speeds range from near 30 mph to stop-and-go operation.

Note: Criteria used by Virginia Department of Highways and Transportation. 1984.

Source: A Policy on Design of Urban Highways and Arterial Streets, American Association of State Highway Officials, 1973.

or more on urban and suburban arterials and fifty-five miles per hour on controlled access highways. A particular service level is best expressed as a ratio. In this case, "B level" of service is equivalent to 1.00. The actual service ratio is determined by dividing traffic volume by capacity. The resultant ratio will be less than, equal to, or greater than 1.00 or 100 percent at a "B level" of service.

A service ratio less than or equal to 1.00 indicates that generally traffic flow will be acceptable at that particular service level. Obviously, driver perception of acceptability will vary according to traffic flow characteristics. A service ratio of 1.00 at an "A level" (free flow) will be preferred to a service ratio of 1.00 at a "D level" (unstable and force flow at rush hour).

Traffic flow is directly impacted by the service volume and capacity of the highway. Level of service and capacity are influenced by roadway and traffic factors which must be considered when evaluating the adequacy of a particular segment of highway. These factors are as follows:[1]

Roadway Factors

1. Lane Width. Lanes that are a minimum of twelve feet are necessary to prevent restrictions of heavy volumes of mixed traffic.

2. Lateral Clearance. Structures or objects closer than six feet to the pavement edge reduce the effective width of a highway.

3. Shoulders. Adequate shoulders must be present to accommodate stopped vehicles if traffic flow is to be maintained.

4. Auxiliary Lanes. Parking lanes, speed change lanes, turning lanes, and climbing lanes provide additional space for special uses that may impede traffic flow.

5. Surface Conditions. Poor pavement does not necessarily restrict capacity but will lower speeds which affects desired service.

1. Traffic Engineering, L. J. Pignataro, 1973.

6. Alinement. Poor alinement restricts maintenance of the desired speed and limits sight distances for those entering the highway or passing.

7. Grades. Grades adversely affect service volumes and capacity by impacting braking distances, sight distances, and uphill speeds.

Traffic Factors

1. Trucks and Buses. Trucks and buses require more space than passenger cars do and may adversely affect traffic flows, especially in densely developed areas.

2. Lane Distribution. Traffic volume distribution, and thus traffic movement, is affected by lane location and by changes in volume. Roadways that vary in the number of lanes (bottleneck) will impede the flow of traffic.

3. Variations of Traffic Flow. Peak-hour flows of traffic can seriously impact traffic flow conditions and the level of service.

4. Traffic Interruptions. Any device or interruption such as at-grade intersections, railroad crossings, and vehicular entrances that require some or all traffic to stop will have a negative impact on traffic flow.

Existing and Projected Traffic Volumes

The table entitled **Detailed Inventory of Major Highways, Roanoke County** describes the traffic volume characteristics of U. S. Routes 11, 220, 221, and 460 as well as Virginia Primary Routes 24, 115, 116, 117, 311, and 419 (see Figure 6-D).

In 1982, the average daily traffic was the heaviest on the southern portion of Route 419. Approximately 32,400 vehicles used the roadway on a

ROANOKE COUNTY, VA.
BEDFORD COUNTY
BOTETOURT COUNTY
VINTON
ROANOKE
SALEM
FRANKLIN COUNTY
FLOYD COUNTY
CRAIG COUNTY
MONTGOMERY COUNTY
MAP REVISED/UPDATED BY
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE

FIGURE 6-D

daily basis in the area of Tanglewood Mall and Ogden Road. The Oak Grove section of 419 was used by 25,600 vehicles per day. Route 117 (Peters Creek Road) was also heavily traveled with almost 20,500 vehicles per day using this route between the Roanoke corporate limits and Route 118 (Airport Road). Approximately 20,500 vehicles per day traveled on U. S. 221 (Brambleton Avenue) between Route 419 and the Roanoke corporate limits. The rural sections of U. S.221, VA 311, and VA 116 had the least amount of daily traffic, averaging approximately 2,500 vehicles per day.

VA Route 115 (Plantation Road) experienced the largest percentage increase in daily traffic volume between 1977 and 1982. U. S. Route 220 was the only major highway in the County that experienced a decrease in average daily traffic volume during the study period.

Daily traffic volume is projected to increase 174 percent along the entire length of Route 115 between 1982 and 1995. Daily traffic volume is projected to decrease 14 percent along the entire length of VA Route 311 during the same study period. These data are presented in greater detail below:

Average Daily Traffic Volume

Route[1]	% of Change in Average Daily Traffic Volume 1977-1982	Projected % Change in Average Daily Volume 1982-1995[2]
U. S. 11	19.0	38.8
VA 24	1.7	46.6
VA 115	47.5	174.4
VA 116	17.5	4.0
VA 117	15.4	11.9
U. S. 220	-8.9	135.3
U. S. 221	23.9	70.7

Route[1]	% of Change in Average Daily Traffic Volume 1977-1982	Projected % Change in Average Daily Volume 1982-1995[2]
VA 311	10.4	-14.4
VA 419	19.3	51.3
U. S. 460	9.2	82.3

1. Includes entire length of route located in Roanoke County.

2. Projected average daily traffic accounts for scheduled improvements to other highways.

Source: Virginia Department of Highways and Transportation and Roanoke County, Department of Development.

Accident Rates

Traffic accidents result from unsafe or illegal acts by drivers or pedestrians, unsafe road conditions, bad weather, or poor visibility. The table entitled **Detailed Inventory of Major Highways, Roanoke County** describes the accident rate characteristics of U. S. Routes 11, 220, 221, and 460 as well as Virginia Primary Routes 24, 115, 116, 117, 311, and 419 for the years 1977, 1979, and 1982.

The accident rate is the number of accidents that occur per mile during a one year study period.

Rate = Accidents/ Length of Highway Segment

The rate of accidents in 1982 ranged from sixty-five per mile on Route 419 between U. S. Route 220 and Starkey Road to one per mile on U. S. Route 221 between Bent Mountain and the Floyd County line. With the exception of VA Route 419 in and around the Tanglewood Mall areas, most major routes experienced a decline in accidents per mile from 1977 to 1982. This occurrence is especially significant considering that traffic volumes have generally increased during the study period. The aforementioned table documents this trend in greater detail.

Physical Characteristics Impacting Accident Rate[1]

Developmental densities will affect the type and location of traffic accidents. Approximately one-half of all accidents in urban areas occur at intersections, as compared to only one-quarter of rural accidents. Pedestrian involvement in traffic accidents increased in direct proportion to the degree of developmental density.

Studies by the Bureau of Public Road (BPR) indicate that full access control is the best possible means of eliminating or reducing accidents. Segment 21 (Route 419 from Cove Road to the corporate limits of Salem) as described by the **Detailed Inventory of Major Highways**, substantiates this claim. The accident rate along this portion of controlled access highway is much lower than any of the other noncontrolled segments of Route 419.

Cross-section elements such as lane width, highway shoulders, and medians affect accident rates. As traffic lanes increase in width, accident rates decrease noticeably. Shoulder width increases and installation of medians (traversable type, deterring type, or nontraversable type) also reduce accident rates.

Horizontal and vertical alinement, i.e. curves and grades, can make any highway more dangerous, especially when they occur simultaneously. Sharp, sudden curves on steep grades are much more hazardous than curves on level terrain.

The frequency of accidents at intersections is influenced by the design, volume of traffic, and the control devices utilized at each intersection. Intersections of roadways with rail lines increase the potential for traffic accidents, depending upon the type of crossing control device used.

1. Traffic Engineering, L. J. Pignataro, 1973.

Roadside objects such as bridge abutments and lampposts can account for an many as 30 percent of all accidents.

Pedestrian and school children safety is enhanced by the installation of devices such as crosswalks, sidewalks, barriers, and guarded crossings.

Nighttime illumination can significantly reduce accidents along major routes. A sufficient level of illumination must be supplied, however, for this tactic to be effective.

The speed of travel and the volume of traffic are perhaps the most commonly recognized determinants that impact an accident rate. Speed limits must correspond with the highway and traffic conditions. Lower speeds may be hazardous in inclement weather while higher speeds may be dangerous in a relatively ideal situation. Traffic volume will affect the accident rate on any highway. The correlation of traffic volume and capacity with the accident rate is the subject of the following section (see also Appendix D, Hazardous Bridges and Railroad Crossings).

Capacity and Accident Rate

Capacity is the maximum number of vehicles that can travel over a given section of highway during a specified time period while operating conditions are maintained at a desired service level. The percent of capacity utilized at a particular level of service is calculated by dividing average daily traffic volume by the capacity. The desired service level within Roanoke County has been established by the Virginia Department of Highways and Transportation as the "B level."

The percent of capacity utilized was determined for the major highways within Roanoke County. At a "B level" of service these percentages vary greatly. Route 419, between Starkey Road and U. S. 220, carried 32,430 vehicles per day in 1982. That particular segment is intended to accommodate

only 21,600 vehicles per day. The percent of capacity utilized in 1982 at a "B level" of service was 150 percent. At a "C level" of service, however, the percent of capacity used would actually decrease even if the traffic volume remained unchanged. At a "C level" of service a tolerance for a lower average speed and congestion at intersections would increase the roadway capacity as the critical density was approached. U. S. 221 (Brambleton Avenue), between the southern corporate limits of Roanoke and Route 419, carried 143 percent of its intended capacity. Peters Creek Road, between the northern corporate limits of Roanoke and Airport Road, carried 102 percent of its intended capacity in 1982. Many rural segments of routes U. S. 221 and VA 311 were under-utilized, carrying only 15 percent of capacity.

Accident rates are determined by dividing the number of accidents within a defined time period by the length of the roadway. In 1982, these rates varied dramatically throughout the County from sixty-five accidents per mile to one accident per mile. Figure 6-D, **Comparison of Design Capacity and Accident Rate, Roanoke County -1982**, depicts the statistical correlation between the percent of design capacity utilized at a "B level" of service and the accident rate.

On a "typical" primary highway in Roanoke County where the average daily traffic volume equals the design capacity, i.e., 100 percent of the design capacity is utilized, the accident rate will equal thirty-six accidents per mile. (The mathematical derivation of this statement is outlined in Appendix E.) The numbered data points represent the actual highway segments described by the **Detailed Inventory of Major Highways.**

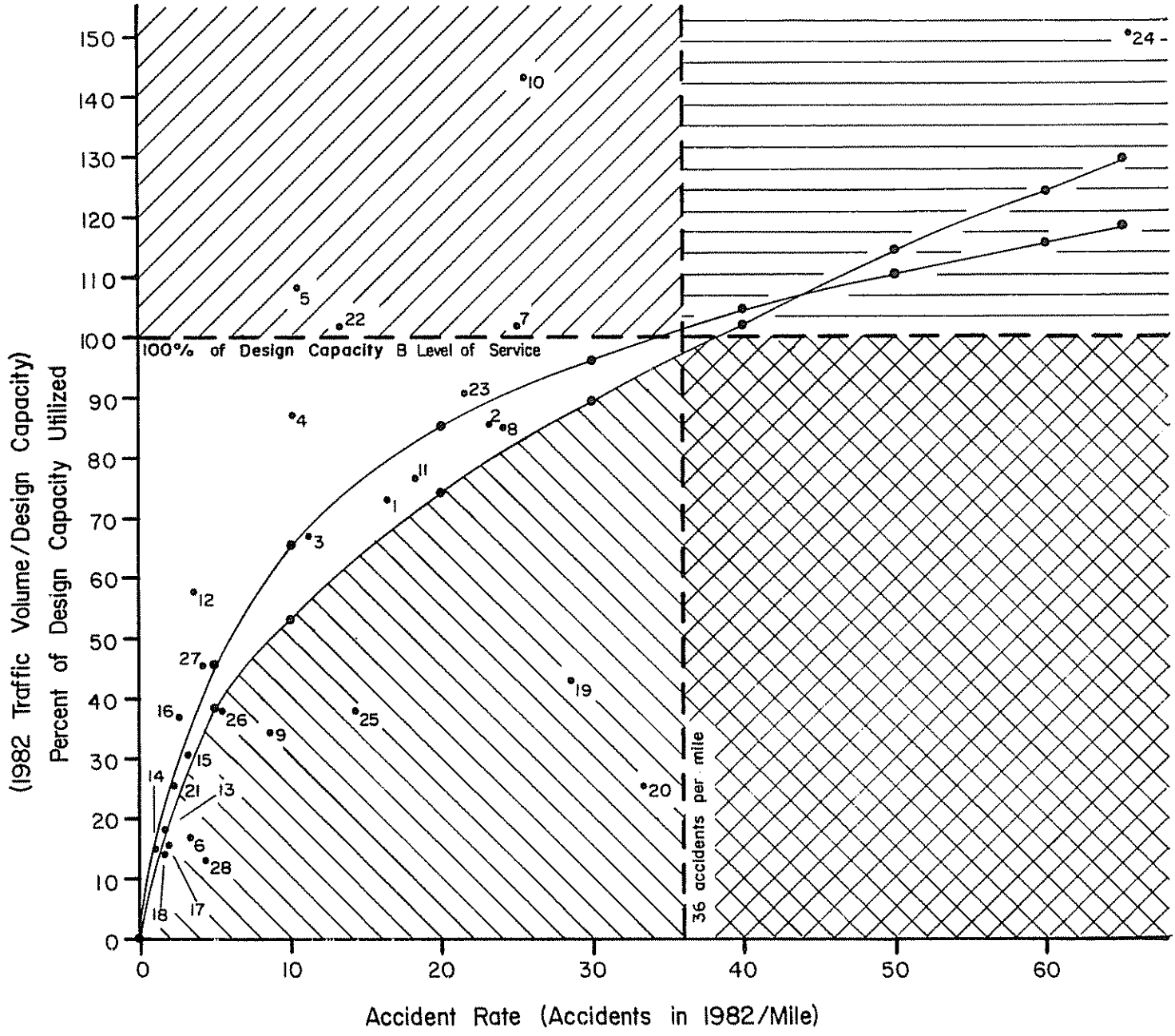
For the purpose of objectively analyzing the comparative adequacy and safety of primary highways within the County at a "B level" of services, five

COMPARISON OF DESIGN CAPACITY AND ACCIDENT RATE

ROANOKE COUNTY – 1982

VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORT.

B LEVEL OF SERVICE



Design capacity not exceeded - Accident rate acceptable

Design capacity exceeded - Accident rate acceptable

Design capacity exceeded - Accident rate unacceptable

Design capacity not exceeded - Accident rate undesirable

Design capacity not exceeded - Accident rate unacceptable

FIGURE 6-E

Note: Points correspond with numbered segments defined by Detailed Inventory of Major Highways

Source: Roanoke County, Department of Development, Department of Public Facilites - Engineering

categories of evaluation were defined. In increasing order of severity these are as follows:

Category 1: capacity not exceeded - accident rate acceptable

Category 2: capacity exceeded - accident rate acceptable

Category 3: capacity exceeded - accident rate unacceptable

Category 4: capacity not exceeded - accident rate undesirable

Category 5: capacity not exceeded - accident rate unacceptable

In Category 1, the percent of capacity utilized is less than 100 percent. The accident rate is below the rate for a typical primary highway in the County and is directly correlated with the capacity utilized, i.e. as the vehicular useage lessen so does the accident rate. Most highways within the County are within this category.

In Category 2, the percent of capacity used exceeds 100 percent. The accident rate, however, is below the rate for a typical primary highway in the County. This correlation demonstrates that although traffic volume is heavy, driver awareness, lower speeds, or effective traffic control devices have resulted in a significantly lower rate of accidents. Brambleton Avenue is an example of this situation.

In Category 3, the percent of capacity utilized exceeds 100 percent and the accident rate exceeds the rate for a typical County primary highway. The high accident rate results from the heavy vehicular useage of the highway. Route 419 in the area of Tanglewood Mall is an example of this situation.

In Category 4, the percent of capacity utilized is less than 100 percent and the accident rate, although below the rate for a typical County primary highway, is undesirable. Route 419, between Route 311 and Lock Haven Road, is not heavily traveled yet the accident rate is relatively high. This occurrence indicates the possibility of an unsafe situation that requires further evaluation.

In Category 5, the percent of capacity utilized is less than 100 percent but the accident rate exceeds the rate for a typical primary County highway. This occurence indicates the existence of an unsafe situation that requires corrections. Fortunately, there are no highways in the County within this category.

In conclusion, these categories are relative measures intended to facilitate objective short-range and long-range decision making pursuant to land use and transportation planning and design. They are not, however, absolute and should not be considered as such.

Motor Freight

The Roanoke SMSA is served by twenty motor freight carriers with terminal facilities located in the metropolitan area. All of these firms are authorized for interstate shipping to and from locations within the Roanoke SMSA. Twenty-five other trucking companies with terminal facilities in several nearby communities also provide interstate, intrastate, and contract services to the area.

Express package service is provided by Federal Express, Pony Express Carrier Corporation, Purolator Carrier Corporation, and United Parcel Service (UPS). Greyhound Package Express is also available at the Roanoke Terminal. Express letter and small package service is provided by the United States Post Office. Special custom design postal express is available to industrial and commercial clients upon request.

Interstate Motor Freight Carriers

with Roanoke Terminal Facilities

Bowman Transportation, Inc.

Overnite Transportation Co.

Consolidated Freightways, Inc.	Pilot Freight Carriers Co.
Estes Express Lines	Preston Trucking Co., Inc.
Falwell Fast Freight, Inc.	Roadway Expres, Inc.
General Motor Lines	Russell Transfer, Inc.
Hall's Motor Transit Co.	Smith's Transfer Corporation
Hatcher Trucking Co., Inc.	Thurston Motor Lines, Inc.
Mason and Dixon Lines, Inc.	Watkins Motor Lines
McLean Trucking Co.	Wilson Trucking Corp.
Old Dominion Freight Lines	Yellow Freight System, Inc.

Source: 1983 American Motor Carrier Directory

Railroads

The Roanoke County-Roanoke-Salem area is served by the Norfolk and Western Railway Company. The N&W provides local freight service to the Hollins, Bonsack, Vinton, Starkey, Dixie Caverns, and Hanging Rock sections of the County on a daily basis. With the exception of the Hanging Rock branch, all these areas are adjacent to mainlines. The N&W operates a trailer-on-flatcar (TOFC) and a container on flatcar (COFC) facility at the intersection of Shenandoah Avenue and 12th Street in Roanoke City. Limited rail passenger service is available via AMTRAK from Lychburg and Clifton Forge.

Air

The Roanoke County-Roanoke-Salem area is served by Woodrum Field, a commercial facility situated within the City of Roanoke. The airport is served regularly by Piedmont Aviation and Air Virginia. Flights are available to many points within Virginia, as well as the Washington, D. C. metro area. The longest runway at Woodrum field is 6,800 feet in length and is paved with

asphalt. Private limousine service and taxi service for corporate jets are available. Private limousine service and taxi service is provided from the airport.

Public Transportation

Interstate and intrastate public transportation is provided by Greyhound Bus Lines and Trailways Bus System with stations located in Roanoke. The Greater Roanoke Transit Company (Valley Metro) serves Roanoke City and selected adjacent locations within Roanoke County, Vinton, and Salem, with fixed route bus service. Nine total routes are run during the week and six on Saturday. Of these routes, three and one, respectively, serve locations in the County or Vinton. A ridership comparison of these three routes and the routes serving the metropolitan area is described in the table, **Route Comparisons.**

The route serving Tanglewood Mall, Friendship Manor, and Vinton experienced significant declines in ridership between fiscal year 1982 and fiscal year 1983. Saturday routing for the latter two routes was eliminated in 1983 because of poor ridership. Ridership for the entire Valley Metro system declined 6.7 percent during the weekdays and 14.5 percent on Saturdays. Valley Metro attributes these trends to a 25 percent fare increase, a 9 percent decrease in the hours of operation, and the general economic recession. Roanoke County and Valley Metro are currently sponsoring an experimental route that serves persons living along Ogden and Starkey Roads.

The Unified Human Services Transportation Systems, Inc. (RADAR - Roanoke Agencies Dial-A-Ride) is a consolidated, non-profit organization that contracts with social service agencies in the Fifth Planning District to provide

Route Comparisons

Cove Road/Prospect Hills*	34.4	25.7	-25.3	27.1	24.3	-10.3
Huntington Court/Wasena*	19.8	19.1	-3.5	11.8	--	--
Kenwood/Vinton-Wise Avenue*	24.5	18.4	-24.9	12.1	--	--
Colonial Heights/Williamson Rd.	26.5	30.1	+13.6	18.2	26.4	+45.1
Lincoln Terrace/Salem-Shenandoah	26.6	26.7	+.4	28.4	25.4	-10.6
Melrose/VA Heights	25.9	25.8	-.4	29.2	33.3	-14.0
Raleigh Court/Villa Heights	29.8	23.5	-21.1	20.6	19.0	-7.8
Riverdale/Rugby	14.3	16.1	+12.6	19.0	-7.8	
Grandin Court	17.8	14.2	-20.2	--	--	--
TOTAL ROUTE PRODUCTIVITY	25.6	23.9	-7.1	22.1	23.6	+6.8

*Routes serving portions of Roanoke County or Vinton.

Source: Greater Roanoke Transit Company, Service Plan FY 1984.

specific supplemental transportation services. Currently, RADAR provides services to County residents enrolled in the Head Start Program, ARC-Center for Human Development, and League of Older Americans. RADAR operates nine buses and ten vans.

A metropolitan ride-sharing program administered by Valley Metro is available to interested residents who work in downtown Roanoke. In addition, there are two companies that provide taxi service to the residents of the Roanoke Valley.

CHAPTER 7

COMMUNITY FACILITIES

COMMUNITY FACILITIES

The quality of community facilities is often the most important indicator of the quality of life that characterizes a particular area. Facilities for education, recreation, administration, and public safety are centers of common use and provide for basic needs. Good community facilities enhance residential values as well as add to the corporate image, thereby attracting more industries and strengthening the tax base upon which community facilities are established and maintained.

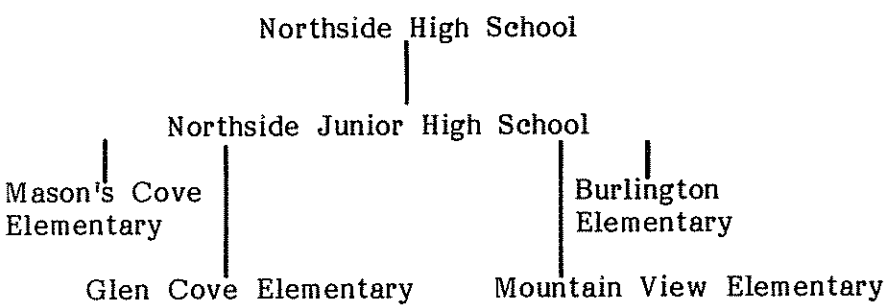
This section of the inventory and analysis describes those facilities and services such as education, fire and police protection, parks and recreation, and general governmental administration that are managed by Roanoke County. "Community goods" such as newspapers, cable television, public broadcasting, radio, and health services, which directly impact the quality of life in the County are also described.

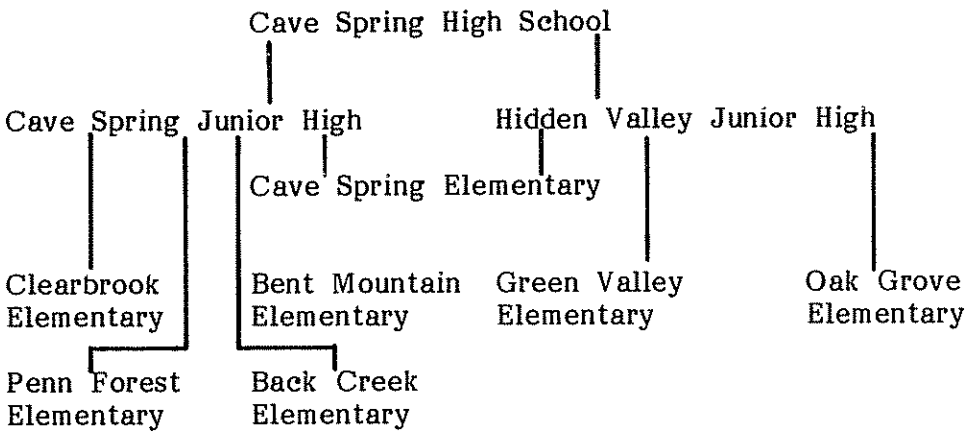
Education

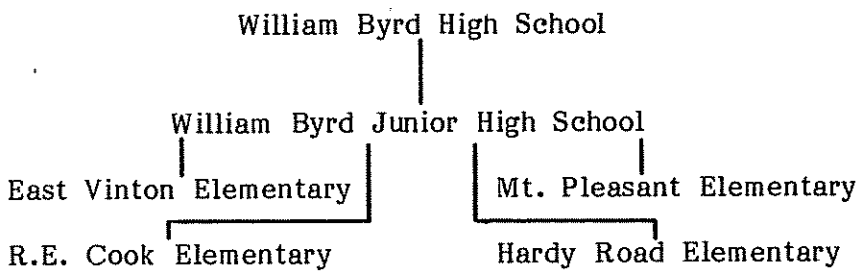
Roanoke County residents have immediate access to many educational facilities. There is one public school system, a vocational technical school, one community college, a two-year business college, and two four-year colleges.

The Roanoke County public school system consists of seventeen elementary schools, four intermediate schools, and four high schools (see table, **Organization - Roanoke County Public School System**). Prior to July, 1983 the County school system served the residents of Salem and included an additional five elementary schools, one intermediate school, and one high school. These facilities are now operated by the City of Salem. The 1982-83 year-end enrollment served by the County system was 17,967 students. Of these pupils, 14,153 resided in either the County or the Town of Vinton. The

Organization - Roanoke County Public School System







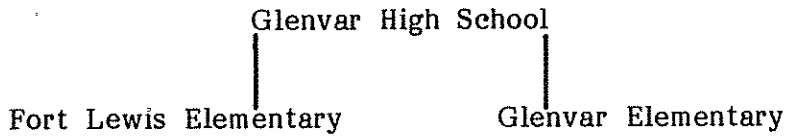


FIGURE 7-A

January, 1984, student population within the County system, including Vinton, was 13,751.

In 1981-82, Roanoke County spent $2,280 per pupil as compared with a statewide average of $2,321. The average elementary school class size of 15.6 pupils per classroom teacher was smaller than the state average of 17.0. The annual average salary for instructional personnel employed by Roanoke County was essentially equivalent to the state figure of $17,720. Approximately 64 percent of the high school graduates from the Roanoke County school system pursued some form of continuing education. This figure exceeded the State average of 60 percent. These data are described in greater detail in the table, **Statistical Data, Public Schools, Roanoke County, 1981-82.**

There are three accredited private schools within the County. Community School, North Cross School, and Roanoke Valley Christian School provide education to approximately 1,120 students from grades one through twelve.

The Arnold R. Burton Vocational - Technical School, located in Salem, serves residents of the Roanoke County - Salem area. Both day and evening instruction is available in many areas of study including auto mechanics, data processing, secretarial sciences, health services, and carpentry.

The Virginia Western Community College, located in Roanoke, serves residents of the area. The Virginia Community College System emphasizes career education. Curricular offerings are designed to meet regional employment needs and include programs in natural resources, arts and design, business, engineering, industrial, health, and public service technologies.

In addition to these curricula, the Virginia Community College System offers through its Industrial Training Division a variety of training programs in management, supervision, and production techniques which are tailored to meet the needs of new, expanding, or existing industries. Other services offered

Statistical Data

Public Schools - Roanoke County

1981-82

	Roanoke County*	Virginia
1981-82 Year-end Enrollment	18,489	989,548
Total Per Pupil Expenditure	$2,280	$2,321
Local Share	1,164	1,127
State Share	804	780
Federal Share	93	188
Sales Tax	219	226
Average Number of Pupils Per Classroom Teacher		
Elementary	15.6	17.0
Secondary	14.6	14.5
Average Annual Instructional Personnel Salary	$17,630	$17,720
Percentage and Number of High School Graduates Continuing Education		
Two-Year College	24.5% (361)	17.1%
Four-Year College	32.0% (472)	35.6%
Other	7.5% (111)	7.3%
Total Graduates	100% (1,475)	100%
Graduates Continuing Education	64% (944)	60%

Note: *includes Salem City

Source: Virginia Department of Education

include assistance in recruiting prospective trainees, developing and implementing training programs, and arranging for suitable training facilities. The cost of these programs is borne completely by the State of Virginia.

The Roanoke County - Roanoke - Salem area is fortunate to have access to many nearby colleges and universities. Roanoke College, a four-year private school with an approximate enrollment of 1,200, is located in Salem. Hollins College, a four-year private college for women with an approximate enrollment of 800, is located in the northern portion of the County. National Business College, a private two-year school, is located in the central business district of Roanoke. Virginia College is a private two-year school located in Roanoke's Old Southwest specializing in computer science.

Virginia Polytechnical Institute and State University (VPI) is located in Blacksburg, approximately thirty-five miles from the Roanoke area. Washington and Lee University and Virginia Military Institute are located in Lexington, approximately fifty miles north of the metropolitan area. Radford University is a four-year state supported institution located in Radford approximately forty miles southwest of Roanoke. Ferrum College is a private four-year school situated in Franklin County.

Virginia Military Institute and VPI are two of five state-supported institutions of higher education that confer bachelor of engineering degrees. Virginia Military Institute will cooperate with new or existing industries by providing the opportunity for employees to pursue undergraduate engineering courses on a part-time basis. The Virginia Military Institute Research Laboratories, a non-profit organization, performs scientific and engineering investigations and research for industry and government on both general and specific problems.

VPI is Virginia's land-grant university with the mandate of providing research and information via its Research and Extension Divisions. The research capabilities of the University Industry Center, the University Center for Environmental Studies, the Virginia Center for Coal and Energy Research, and the Virginia Water Resources Center are available to industry.

Public School Facilities

The table titled **Facility Inventory, Public Schools - Roanoke County, 1983**, describes the grades served, site size, original construction date, date of additions, capacity, and percent of capacity utilized for each public elementary and secondary school facility in the County.

Currently, there are 259 acres of land used for secondary facilities, 187 acres used for elementary facilities, and fifty-six acres used for special and vocational facilities. In addition, the School Board has reserved approximately twenty acres of vacant land adjacent to Route 781 in the Hollins Magisterial District for future construction.

The current student enrollment exceeds the design capacity only at Cave Spring High School in the 1983-84 school year. Of the twenty-eight school facilities within the system, six have current enrollments that exceed 85 percent of their respective design capacities.

Range of Design Capacity Utilized	Number of Schools
Over 100%	1
85 - 100%	5
70 - 84%	12
55 - 69%	8
Below 55%	2
TOTAL	28

The Virginia Department of Education has established spatial standards for elementary and secondary school sites. Each elementary school must be situated on at least a five acre parcel with an additional one acre for every 100 students. Each secondary school must be located on at least a ten acre parcel with an additional one acre for every 100 students. Of the eight secondary schools operated by the County, five conform with this standard. Seven of seventeen elementary schools conform with the state standard. Of the non-conforming secondary and elementary facilities, most were built prior to 1960 and some before 1940.

Facility Inventory
Public Schools - Roanoke County
1983

Schools	Grades	Site Size (Acres) Actual	Site Size (Acres) Desired	Construction Date	Date of Additions	Capacity	January, 1984 Enrollment	Percent of Capacity Utilized
Secondary:								
Cave Spring High	10-12	40	25	1968	1970	1,275	1,310	103
Northside High	10-12	27.97	26	1961	1963,1966	1,030	899	87
William Byrd High	9-12	55.4	22	1969	—	1,200	1,084	90
Glenvar High	7-12	46.15	22	1964	—	1,100	702	64
Cave Spring Junior	6-9	13.5	22	1956	1958,1959	1,100	895	81
Hidden Valley Junior	6-9	38.75	26	1972	—	1,300	954	73
Northside Junior	7-9	20.5	26	1970	1974	1,200	1,027	86
William Byrd Junior	7-8	17.16	23	1932	1935,1938,1953	1,000	704	70
Elementary:								
Back Creek	K-5	7	9	1937	1959,1970	150	148	99
Bent Mountain	1-6	5.3	7	1911	1930	75	51	68
Burlington	K-6	10	12	1939	1953,1966,1970	575	391	68
Cave Spring	K-5	13	12	1961	1970	475	364	77
Clearbrook	K-6	8.8	9	1938	1958,1969,1979	240	134	56
East Vinton	K-6	12.2	12	1961	1965,1970,1983	720	563	78
Fort Lewis	K-6	5.3	8	1928	1937,1941	210	165	79
Glen Cove	K-6	15.33	16	1971	—	825	599	73
Glenvar	K-6	15	12	1959	1970	550	492	89
Green Valley	K-6	14.3	12	1964	1970	500	346	69
Hardy Road	K-6	17.7	16	1972	—	825	652	79
Mason's Cove	K-6	10	9	1961	1963,1968	325	266	82
Mount Pleasant	K-6	7.04	10	1934	1952,1958,1970, 1979,1983	540	446	83
Mountain View	K-6	11.8	13	1959	1962,1968	625	397	64
Oak Grove	K-5	11.46	13	1958	1963,1968	575	443	77
Penn Forest	K-5	20.40	16	1972	—	825	521	63
Roland E. Cook	K-6	2.28	9	1915	1966	260	198	76
TOTAL						17,500	13,751	79

Continued

Schools	Grades	Site Size (Acres) Actual	Site Size (Acres) Desired	Construction Date	Date of Additions	Capacity	January,1984 Enrollment	Percent of Capacity Utilized
Special and Vocational:[1]								
Roanoke County Occupational	--	20.67	13	1972	—	280	135	48
A. R. Burton	11-12	22.92	20	1964	1966,1979	575	189	33
Southview	7-10	12	17	1938	1955,1964,1970	225	140	62
TOTAL						1,080	464[1]	43

[1]All of these students are included in the total for elementary and secondary pupils.

Note: The School Board owns an additional 19.66 acres of vacant land located adjacent to Route 781 in the Hollins Magisterial District.

Source: Superintendent of Schools, Roanoke County

Projected Enrollment

Enrollment is projected to decrease approximately 2 percent per year through the 1987 school year. The cumulative projected percentage decrease during the study period, 1984 through 1987, is 6.8 percent. Schools serving the western portion of the County are expected to experience the largest percentage decrease, 11.4 percent, while it is anticipated that schools serving the southwest portion of the County will sustain the greatest actual decrease, 428 students. The Vinton area schools are expected to experience both the smallest percentage and actual decreases, 3.0 percent and 108 pupils, respectively.

From a system-wide perspective, it is anticipated that the five schools serving junior high school students will sustain the greatest percentage decreases, an average of almost 5.2 percent per year per school through the 1987 school year. This significant decrease will eventually impact the enrollments of the four County high schools. Elementary school enrollment is expected to decrease 1.7 percent during the study period. High school enrollment is projected to decrease almost 2 percent during the study period.

In 1980, there were 18,334 school-aged (5 - 19 years) residents of Roanoke County. It is estimated that 18,136 school-aged persons resided in the County at the beginning of the 1983-1984 school year. (Note: school-aged persons may include those enrolled in private schools, colleges and universities as well as some individuals no longer enrolled.) It is projected that the number of school-aged persons will continue to decline until 1990 and then increase moderately through the year 2000. The West County School Service Area is expected to sustain the greatest percentage total population increase (96 percent) between 1983 and the year 2003. The North County School Service Area will sustain the largest actual total population increase

(8,147 persons) during the study period. The following tables, **Projected School Years Enrollment 1984-1987**, and **Projected School-Aged Population**, describe these trends more fully. Figure 7B defines the four school service areas and the the total projected population epected within each area in 1993 and the year 2003.

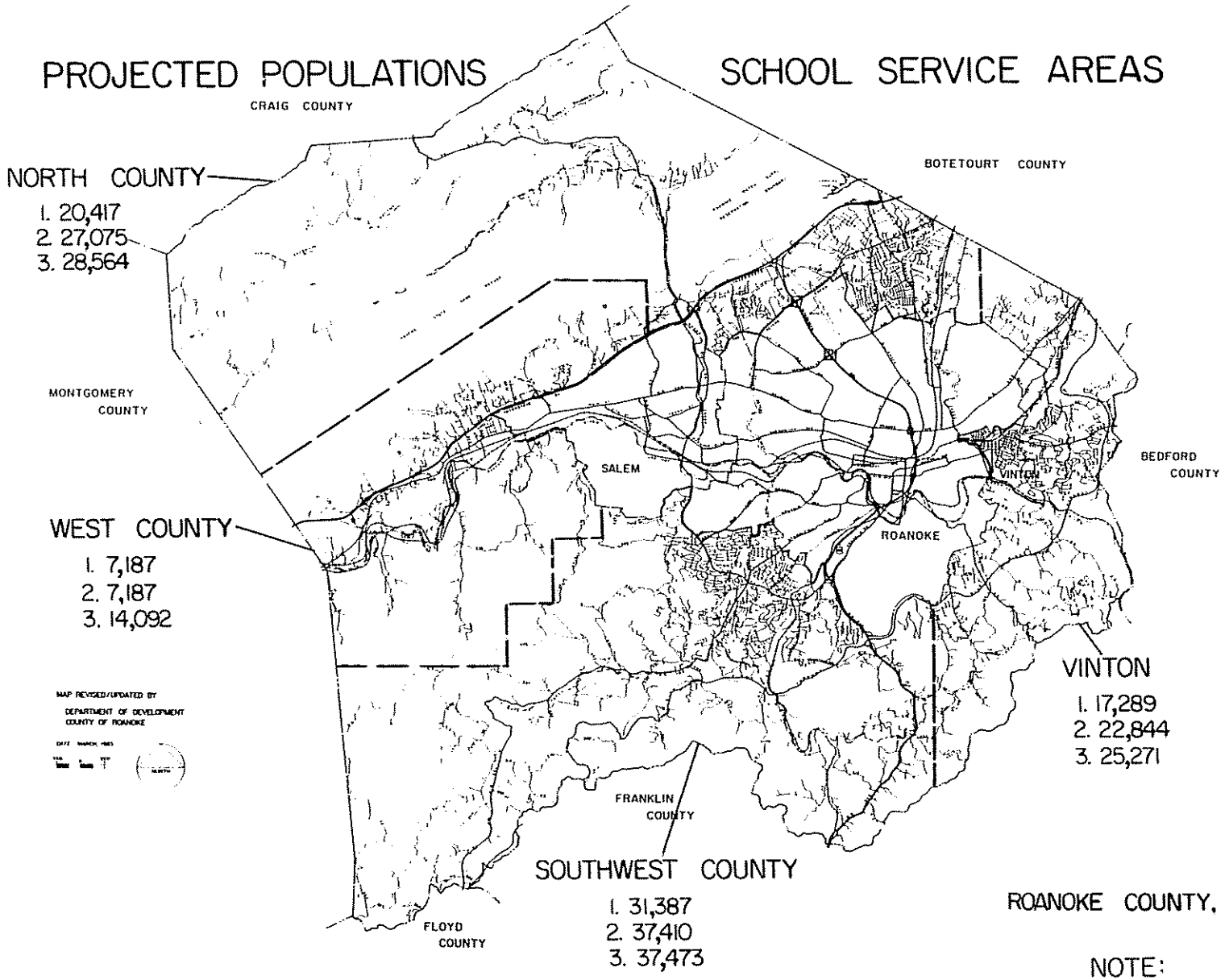

PROJECTED POPULATIONS
SCHOOL SERVICE AREAS
CRAIG COUNTY
BOTETOURT COUNTY
NORTH COUNTY
1. 20,417
2. 27,075
3. 28,564
MONTGOMERY COUNTY
SALEM
VINTON
BEDFORD COUNTY
ROANOKE
WEST COUNTY
1. 7,187
2. 7,187
3. 14,092
MAP REVISED/UPDATED BY
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
VINTON
1. 17,289
2. 22,844
3. 25,271
FRANKLIN COUNTY
SOUTHWEST COUNTY
1. 31,387
2. 37,410
3. 37,473
FLOYD COUNTY
ROANOKE COUNTY, VA.
NOTE:
1. 1983 POPULATION
2. 1993 PROJECTED POPULATION
3. 2003 PROJECTED POPULATION

FIGURE 7-B

Projected Enrollment

Schools Years 1984 - 1987

School Year	January 1984	1985	1986	1987	% Change 1984 - 1987
North County Schools					
Northside High School	899	908	940	866	-3.7
Northside Junior High School	1,027	945	848	799	-22.2
Mason's Cove Elementary	266	255	240	238	-10.5
Glen Cove Elementary	599	612	616	624	4.2
Burlington Elementary	391	389	398	406	3.8
Mountain View Elementary	397	402	410	421	3.8
TOTAL	3,579	3,511	3,452	3,345	-6.5
Vinton Area Schools					
William Byrd High School	1,084	1,142	1,182	1,165	7.5
William Byrd Junior High School	704	673	649	625	-11.2
East Vinton Elementary	563	550	525	500	-11.2
Hardy Road Elementary	652	642	638	638	-2.2
Mount Pleasant Elementary	446	435	430	425	-4.7
Roland E. Cook Elementary	198	156	185	186	-6.1
TOTAL	3,647	3,628	3,609	3,539	-3.0

Projected Enrollment

School Year	January 1984	1985	1986	1987	% Change 1984 - 1987
West County Schools					
Glenvar High School	702	680	585	548	-21.9
Fort Lewis Elementary	165	169	173	182	10.3
Glenvar Elementary	492	482	476	471	4.3
TOTAL	1,359	1,331	1,234	1,201	-11.4
Southwest County Schools					
Cave Spring High School	1,310	1,377	1,377	1,339	2.2
Cave Spring Junior High School	895	805	749	710	-20.7
Hidden Valley Junior High School	954	872	782	702	-26.4
Back Creek Elementary	148	151	154	151	2.0
Bent Mountain Elementary	51	49	54	53	3.9
Cave Spring Elementary	364	369	361	362	-.6
Clearbrook Elementary	134	132	134	134	—
Green Valley Elementary	346	346	350	355	2.6
Oak Grove Elementary	443	443	447	452	2.0
Penn Forest Elementary	521	502	489	480	-7.9
TOTAL	5,166	5,046	4,897	4,738	-8.3

Page 3
Projected Enrollment

School Year	January 1984	1985	1986	1987	% Change 1984 - 1987
Total System	13,741	13,512	13,190	12,824	-6.7

Average Annual Percentage Change: -1.7

Note: All vocational and special education students are included in projections.

Source: Institutional Research, Roanoke County Public Schools

Department of Development, Roanoke County

Projected School-Aged Population

Year	Population (5-19 years of age)	Percentage Change
1983	18,334 (current)	-1.81
1985	18,002	-1.81
1990	18,011	-.5
1995	18,696	3.80
2000	19,245	2.94

Source: Bureau of the Census

Roanoke County, Department of Development

Department of Planning and Budget, Commonwealth of Virginia

Libraries

The Roanoke County Public Library, with its headquarters one-quarter of a mile west of the intersection of U. S. Route 221 and Virginia Route 419, serves citizens of the County, the cities of Salem and Roanoke, employees of Roanoke County, and Roanoke County taxpayers who are not residents. Branches are located in the Town of Vinton, as well as the Hollins, Glenvar, and Bent Mountain areas of the County. There are approximately 216,270 volumes within the entire system. The 1982 annual circulation was approximately 650,000 volumes. Films, records, cassettes, and slides are also available.

In addition to the County system, the cities of Salem and Roanoke both operate their own library facilities. These libraries are available to County residents through an inter-governmental agreement.

Each of the four colleges in the area has its own library. The library of Virginia Western Community College has approximately 48,000 books; 7,500 reels of microfilm; subscriptions to 600 periodicals; and 2,100 records and tapes. A non-student library card is available to state residents 16 years of age and older. The libraries of Hollins College, Roanoke College and National Business College have a combined total of 352,000 books, which are available to the public for use on the premises.

Roanoke County Library Analysis

The County library system is comprised of a central library and four branches. All libraries except for the Bent Mountain facility were built since 1970. The staff has grown from eleven full-time and eight part-time personnel in 1970 to twenty-nine full-time and two part-time personnel in 1983.

The main library has 13,900 square feet of floor space, while the four branches average 5,100 square feet per facility. The total County library floor

space amounts to .45 square feet per County resident. The minimum standard for Virginia public libraries as recommended by the State Library Board and adopted by the Roanoke County Library Board, is .6 square feet per person. There are ninety-one parking spaces provided at the main library, and an average of twenty-eight spaces at the branches. Each library is open sixty-four hours per week, except for the Bent Mountain Library which operates twenty hours per week.

1. Bent Mountain - The Bent Mountain Library serves the Bent Mountain Community Planning Area which has a current population of 862 persons. The library has 700 squre feet of floor space and is capable of serving 1,150 persons at .6 square feet per person. The projected population for the service area in the year 2003 is 911 persons.

2. Glenvar - The Glenvar Library serves the Glenvar Community Planning Area which has a current population of 7,187 persons. The library has 5,114 square feet of floor space and is capable of serving 8,500 persons at .6 square feet per person. The projected population for the service area in the year 2003 is 14,097 persons. Using the standard of .6 square feet per person, a facility with a total floor area of 8,500 square feet will be required by the year 2003.

3. Hollins - The Hollins Library serves the Peters Creek, Mason's Cove, and Catawba Community Planning Areas which have a current combined population of 20,417 persons. The library has 6,575 square feet of floor space and is capable of serving only 10,960 persons at .6 square feet per person. The projected population for the service area in the year 2003 is 28,564 persons. Using the standard of .6 squre feet per person, a facility (or multiple facilities) with a total floor area of 17,140 square feet will be required by the year 2003.

4. Vinton - The Vinton Library serves the Town of Vinton and the Vinton, Bonsack, and Mount Pleasant Community Planning Areas which have a

current combined population of 17,289 persons. The library has 7,500 square feet of floor space and is capable of serving only 12,500 persons at .6 squre feet per person. The projected population for the service area in the year 2003 is 25,271 persons. Using the standard of .6 square feet per person, a facility (or multiple facilites) with a total floor area of 15,170 square feet will be required by the year 2003.

5. Headquarters - The Headquarters Library serves the Windsor Hills, Cave Spring, Back Creek, and Clearbrook Community Planning Areas which have a current combined population of 30,525 persons. The library has 12,000 square feet of floor space and is capable of serving only 20,000 persons at .6 square feet per person. The projected population for the service area in the year 2003 is 36,562 persons. Using the standard of .6 square feet per person, a facility (or multiple facilities) with a total floor area of 22,000 square feet will be required by the year 2003.

Medical

The Roanoke metropolitan area is served by over 200 physicians. Besides general practitioners, there are many specialists available to residents in the area. There are more than 100 dentists practicing in Roanoke County and the cities of Roanoke and Salem.

Three hospitals, Lewis-Gale, Roanoke Memorial, and Community Hospital of Roanoke Valley, located in Salem and Roanoke respectively, provide health care services to area residents. Each hospital has complete emergency room capabilities. Together, the three have 1,414 total beds. A detailed description of each facility is as follows:

Hospital Services in the Roanoke Valley

	Lewis-Gale Medical Center	Roanoke Memorial	Community Hospital Roanoke Valley
# Physicians	250 (approx)	305	297
Emergency Room	yes	yes	yes
Total Beds	406	680	400
- Medical/surgical	349	511	298
- Pediatric	12	45	36
- Ob/gyn	25	35	30
- Intensive Care Unit	10	22	10
- Cardiac Care Unit	10	13	5
- Progressive Care	—	54	21
# Patients Admitted in 1982	14,113	24,817	15,644
Outside Clinics	Fincastle (Bot. Co.) Peters Creek Road Bent Mountain Back Creek Fort Lewis West Salem Route 220 New Castle (Craig Co.) Old S. W. Roanoke	Family Practice - Vinton - Fincastle (Bot. Co.) - S. W. Roanoke	None
Outpatient Care	yes	yes (extensive)	yes
Teaching Facilities	none	Affiliated with UVA Nursing School Instruction in: RN, LPN, Lab Technician, Nuclear Medical Technician, Radiology Technician	

Source: Administrator of respective institution

The Veteran's Administration Hospital, a federally operated, 1,400-bed facility, provides medical and psychiatric treatment to eligible veterans. Gill Memorial Hospital specializes in eye, ear, nose, and throat care and is equipped with forty beds. In addition to hospital services, County residents are served by volunteer rescue squads located in Salem, Vinton, Cave Spring, Catawba, Hollins (Peters Creek), Mount Pleasant, Clearbrook, Bent Mountain, Glenvar,

and Masons' Cove. Alcoholic and mental health services are available from several local, privately-operated organizations. Fourteen psychiatrists have independent practices in the area.

Fire Protection

Fire protection for Roanoke County is provided by ten fire departments. Eight of these are located in the County. The Vinton Fire Department and the Salem Fire Department, Number One Station, provide service to adjacent areas of the County as specified by contractual agreement. The Salem station is staffed by full-time fire fighters. The County stations located in Cave Spring, Hollins, Mount Pleasant, Clearbrook, and Glenvar are staffed by full-time fire fighters and supplemented by volunteers. The remaining portions of the County are served by volunteer companies located in Vinton, Catawba, Bent Mountain, and Mason's Cove. In addition to these departments, the volunteer fire departments of Elliston (Montgomery County); Boones Mill (Franklin County); Stewartsville (Bedford County); Fincastle and Troutville (Botetourt County); and Copper Hill/Check (Floyd County); as well as the departments of Salem and Roanoke; provide support services to those portions of Roanoke County which are nearby. All of the urbanized portions of the County, and virtually all of the rural sections as well, can be reached within ten minutes of travel time, the period considered to be the maximum in order to avoid major losses of property . A twenty-four hour central dispatch operated by personnel from the Sheriff's Department notifies fire and rescue workers of all calls for assistance.

The Insurance Services Office of Virginia has assigned a Class Six fire insurance classification to properties in Roanoke County that are within a four-mile traveling distance of a fire station and are served by the municipal

fire hydrant system. A rating of 1.0 is excellent, a rating of 10.0 is unacceptable.

The County does not have a reciprocal emergency service agreement with any of the surrounding counties. The current policy is to provide fire and rescue and assistance when requested. Of the 2,400 calls answered in 1982, approximately 1 percent originated outside of Roanoke County.

Volunteers comprise 86 percent of the total firefighters currently protecting properties in Raonoke County. However, of the forty-four full-time firefighters, twenty-four are employed by the City of Salem and are stationed at the Salem Fire Station One. The number of participating volunteers has been declining steadily in recent years. When coupled with an increasing population, this decline may adversely effect fire protection within the County. Nevertheless, Roanoke County greatly exceeds the American Insurance Association recommendation of 1.6 to 2.4 personnel per 1,000 population.

With the exception of the Cave Spring Fire Station and the Mason's Cove Public Safety Building, all other buildings have adequate space for the storage of additional equipment. Both of these facilities, as well as the Cave Spring Rescue Squad, will be replaced with public safety buildings designed to accommodate the equipment required for service until the year 2005.

The County is currently training a hazardous materials response team to adequately manage chemical spills. A special response vehicle will be garaged at the Hollins Public Safety Building.

A detailed inventory of the County's fire and rescue services and a profile of the calls answered during June, 1983 is as follows:

Fire and Rescue Services

Location	EQUIPMENT					VOLUNTEERS		FULL-TIME
	Pumper	Ladder	Tanker	Rescue	Other	Fire	Rescue	Fire
Salem Fire Station #1	3	1	-	-	-	-0-	-	24
Salem Rescue Squad	-	-	-	7	-	-	45	-
Vinton Fire Station	3	-	2	-	3	35	-	-0-
Vinton Rescue Squad	-	-	-	6	-	-	52	-
Roanoke County Fire Station #3-Cave Spring	2	1	1	-	1	51	-	6
Cave Spring Rescue Squad	-	-	-	5	-	-	56	-
Public Safety Buildings Fire/Rescue								
#4 Catawba	1	-0-	1	2	-0-	23	20	-0-
#5 Hollins	2	1	-0-	4	3	26	37	6
#6 Mt. Pleasant	2	-0-	1	4	1	26	26	1½
#7 Clearbrook	2	-0-	-0-	4	1	30	39	3
#8 Bent Mountain	2	-0-	-0-	4	1	28	23	-0-
#9 Fort Lewis	2	-0-	1	4	2	25	32	3
#10 Mason's Cove	1	-0-	1	1	1	23	21	-0-
TOTAL	17	3	5	41	10	267	351	43.5

Source: Fire and Emergency Services Coordinator, Roanoke County
City of Salem, Town of Vinton

Emergency Calls Answered - June, 1983

Location	Total Calls Fire	Rescue	Average Calls Per Day
Salem Fire Station #1	7	-	.2
Salem Rescue Squad	-	5	.2
Vinton Fire Station	9	-	.3
Vinton Rescue Squd	-	9	.3
Roanoke County Fire Station #3 - Cave Spring	51	-	1.7
Cave Spring Rescue Squad	-	72	2.4
Catawba Fire Dept. #4	7	-	.2
Catawba Rescue Squad[1]	-	29	1.0
Hollins Fire Dept. #5	42	-	1.4
Hollins Rescue Squd	-	92	3.1
Mt. Pleasent Fire Dept. #6	13	-	.4
Mt. Pleasent Rescue Squd	-	23	.8
Clearbrook Fire Dept. #7	21	-	.7
Clearbrook Rescue Squad	-	42	1.4
Bent Mtn. Fire Dept. #8	3	-	.1
Bent Mtn. Rescue Squad	-	5	.2
Fort Lewis Fire Dept. #9	27	-	.9
Fort Lewis Rescue Squad	-	64	2.1
Mason's Cove Fire Dept. #10	14	-	.5
Total	194	341	6.5/11.4

1. Mason's Cove Rescue Squad calls included in count for Catawba.

Source: Emergency Services Dispatcher

Law Enforcement

The citizens of Roanoke County are served by two law enforcement agencies: the Roanoke County Sheriff's Department, headquartered in Salem, and the Virginia State Police. The Town of Vinton maintains a separate department that works closely with the Sheriff's Department.

The Sheriff's Department is responsible for all areas of law enforcement: preventive patrol, felony investigation, traffic enforcement, citizen calls for service, youth and family service, and criminal process.

Of the 160 persons employed by the Sheriff, fifty-eight are sworn law enforcement officials. There are four platoons consisting of eight officers on duty at any one time to cover six defined patrol zones that are each approximately forty-one square miles in area. Generally, one officer is assigned to cover one zone, one officer provides back-up assistance, and one officer functions as the shift supervisor. Although there is no written mutual aid agreement or interjurisdictional authority bestowed, law enforcement officials from other localities do help when requested.

Overall crime in Roanoke County was reduced 6.7 percent between 1980 and 1981 and 2.7 percent between 1981 and 1982. Approximately 34 percent of crimes reported in 1982 were solved. In 1981, the Sheriff's Department responded to 3,753 total calls. Of these 511 were burglaries; 1,361 were larcenies; 1,159 were traffic accidents;and 722 were alarms. In 1982, the total calls received declined 5.5 percent to 3,548. A summary follows:

Crime Reports - Roanoke County Sheriff's Department

	Burglaries	Larcenies	Traffic Accidents	Alarms	TOTAL
1981	511	1,361	1,159	722	3,753
1982	365	1,375	924	884	3,548
1983[1]	170	869	519	503	2,061

1. As of August 1, 1983

Source: Roanoke County Sheriff's Department

The Roanoke County-Salem Jail, located in the central business district of Salem, is operated jointly by the counties of Roanoke and Craig and the City of Salem. There is room for 104 prisoners. Sixty-one employees of the Sheriff's Department are assigned to work within the jail.

The Sheriff of Roanoke County is an elected official, a constitutional officer, whose salary is paid by the State. With a sheriff's department, as opposed to a county police department, the State is obligated to subsidize one sworn law enforcement position for every 2,000 people. Any additional positions must be paid for by the jurisdiction. Forty of the fifty-eight total sworn law enforcement positions in Roanoke County are state-supported, the remaining eighteen positions are provided for by the County. Currently, there are .76 officers for every 1,000 residents of the County. In contrast, a police department is a municipal office, administered by a department head (police chief) who reports to the chief executive officer. A police department is more dependent upon local appropriations than a sheriff's department. The following table describes more fully the personnel of the Roanoke County Sheriff's Department.

Personnel - Roanoke County

Division	Number of Persons
Civil	16
Detective	14 (clerical included)
Youth & Family Services	7
Uniform Patrol	38 (clerical included)
Administration	7
Data Processing	2
Personnel & Training	1
Dispatchers	14
Jail	61
School Crossing	6 (part-time)
Total	166 (160 full-time)

Source: Sheriff's Department, Roanoke County

In addition to the Sheriff's Department, there are seventeen Virginia State Police officers assigned to Roanoke County. Of this total, fourteen are

full-time law enforcement officials, three are administrators.

The following table examines the ratio of sworn officers per 1,000 population in several localities within Virginia.

Officers Per 1,000 Population

Jurisdiction	Ratio	Sheriff's Department	Police Deparmtent
Roanoke County	.758	x	
Roanoke City	2.196		x
Salem City	2.0		x
Henrico County	1.78		x
Chesterfield County	1.16		x
Prince William Co.	1.37		x
Rockbridge County	1.34	x	
Rockingham County	.403	x	
Bath County	2.24	x	

Note: Ratio varies depending upon funding sources, population density, the number of towns or cities within jurisdictions.

Source: Respective law enforcement agencies.

To maintain the current ratio of .758 officers per 1,000 population, the current force of fifty-eight sworn officers will have to be increased to seventy-two positions in 1993 and eighty positions by the year 2003.

Newspapers

Four newspapers are published locally covering events occurring in the Roanoke Valley, the State, and the nation. The Roanoke Times and World News is published daily. The Roanoke Tribune, The Vinton Messenger, and The Salem Times-Register are published weekly. Home delivery is available for the Richmond times Dispatch and The Washington Post. The Wall Street Journal and New York Times are also circulated in the area.

Cable Television and Public Broadcasting, Radio Stations

The City of Roanoke and those portions of Roanoke County which are adjacent to the City are served by Roanoke Valley Cablevision. The City of Salem and adjacent areas of the County are served by Salem Cable T.V. Co.

In addition to regular cable services which include ESPN, local weather, and educational programming, HBO and Cinemax, as well as other subscriber channels, are available from both companies for an additional charge.

Public broadcasting station WBRA, with business offices and studios in Roanoke, serves a large area from Appomattox, Virginia, to Knoxville, Tennessee. Among the services offered by WBRA to industry and government are the creation of video programs for training purposes and the production of marketing tapes to be used to attract specific industries and interest to the Roanoke Valley. As a member of the public broadcasting system, WBRA has the ability to send and receive teleconferencing communications to and from other public broadcasting stations.

WBRA, in conjunction with the University of Virginia and Virginia Polytechnical Institute, expects to be able to broadcast via a two-wave microwave linkage engineering programs originating from he universities to industries in the Roanoke area. It is possible that graduate and continuing instruction in engineering will be available to interested firms as early as the spring of 1984.

Three commercial television stations, WDBJ (CBS), WSLS (NBC), and WSET (ABC) serve the Roanoke area. The former two have offices and studios in Roanoke. WSET is headquartered in Lynchburg.

Radio Stations

Call Letters	Time of Operation	Network Affiliation
WXLK - FM	24 hours a day; 7 days a week	RKO
WFIR - AM	24 hours a day; 7 days a week	CBS Radio
WJLM - FM	24 hours a day; 7 days a week	ABC, Mutual, Va. Radio Network
WKBA - AM	Sunrise to Sunset 7 days a week	None

WPVR - FM	24 hours a day 7 days a week	None
WRIS - AM	Sunrise to Sunset 7 days a week	ABC, Mutual, Va. Radio Network
WROV - AM	24 hours a day 7 days a week	ABC
WSAY - AM	6 a.m. - Sundown 7 days a week	ABC
WSLC - AM	24 hours a day 7 days a week	NBC
WSLQ - FM	24 hours a day 7 days a week	ABC
WTOY - AM	Sunrise to Sunset	Sheridan Broadcasting Network News
WVTF - FM	6 a.m. midnight Sun. - Thurs. 6 a.m. - 1 a.m. Fri. - Sat.	National Public Radio

Parks and Recreation

The Roanoke County Parks and Recreation Department provides special interest and community education programs, leisure art activities, life-time sports, senior citizen activities, therapeutics, youth and adult athletic programs, and various special events for the citizens of both Roanoke County and the Town of Vinton. There are 427.5 acres of County-controlled parkland available to residents of the County. Of this amount, 218.7 acres are either adjacent to or situated on an existing elementary, junior high, or high school site. With the exception of seven and one-half acres located in the cities of Roanoke and Salem, all County park facilities are situated within either the Town or the County. Of the total area, 408.5 acres are owned by the County (Board of Supervisors or School Board). The remaining nineteen acres are leased.

Classification

The Virginia Commission of Outdoor Recreation (COR) classifies parkland

according to size and usage. There are essentially three major park classifications: neighborhood, community, and district. The mini-park is a sub-classification of the neighborhood category and serves persons who are within a five minute walking distance of the park. The regional park is a larger facility that is generally shared by two or more jurisdictions and is within forty-five minutes of driving time from the target population.

A neighborhood park generally ranges in size from five to twenty acres and serves intense urban or suburban development. The COR suggests that a neighborhood park should contain a playground, open playfields, multi-purpose courts, and tennis courts. The park should be located in quiet areas, away from traffic and hazardous activities.

A community park ranges in size from twenty to fifty acres and has a service radius of one mile in an urban/suburban area. The COR recommends that a community park should contain lighted playfields, a swimming pool, and ample open space for walking and jogging, in addition to the facilities found in a neighborhood park.

A district park is larger than fifty acres and has a service radius that exceeds five miles. The COR advises that a district park should include those facilities found within both a neighborhood and community parks as well as open space for passive and structured recreational activities.

Existing Supply and Demand of Park Acreage

The Virginia Commission of Outdoor Recreation suggests that spatial standards that define the desired ratio of parkland acreages per 1,000 population should be used as points of reference when evaluating an existing supply of park acreage. The population ratio standard is founded upon the principle that recreation is related to people. As the population of a jurisdiction increases,

the corresponding demand for recreational activities and open space will also increase. To be totally effective, however, this standard must be used in conjunction with an inventory and analysis of the activities and facilities available at each site. The attractiveness of a park usually corresponds more with the character of its offerings rather than with the amount of available acreage. The actual service radius of a particular park is dependent upon both its size and facilities. The potential service radius is dependent only upon size. These suggested spatial standards and the resulting service radii are as follows:

Suggested Spatial Standards

	Acres/1,000 Population	Potential Service Radius		Minimum Area in Acres
		Urban/Suburban	Rural	
Mini Park	—	¼ - ½ mile	¼ - ½ mile	less than 5
Neighborhood Park	3	½ mile	1 - 1½miles	5
Community Park	3	1 mile	3 - 7 mile	20
District Park	4	5 - 7 miles	10 - 15 miles	50
Total Parks		populated areas	25 miles	100
Regional Park	10	25 miles	25 miles	varies

1. May be shared by 2 or more jurisdictions.

Source: Commission on Outdoor Recreation, Commonwealth of Virginia

There are 427.5 total acres of parkland in Roanoke County and the Town of Vinton. The existing demand, based on the standards developed by the COR, is almost twice the existing supply. By the year 2003, the demand is expected to increase from 765.0 total acres to 1,054 total acres. The existing stock of parkland will have to be increased 622 total acres to accommodate this anticipated growth.

The existing distribution of park acreage generally corresponds with the distribution of population. Most of the total acreage is concentrated in the

urban fringe, however, parks are also located in Catawba, Mason's Cove, Dundee, Back Creek, and Bent Mountain. A more detailed examination of existing park acreage and projected demand follows:

Existing Park Acreages and Projected Demand[1]

			Demand	
	Existing Supply	Existing Demand	1993	2003
Mini Park	39.95 ac.	-	-	-
Neighborhood Park	134.05 ac.	229.5 ac.	286.5	316.2
Community Park	132.0 ac.	229.5 ac.	286.5	316.2
District Park	121.5 ac.	306.0 ac.	382.0	421.6
TOTAL	427.5 ac.	765.0 ac.	955.0	1,054.0

1. The current estimated population of Roanoke County and Vinton is 76,500. Projected population is 95,500 in 1993 and 105,400 in the year 2003.

Source: Division of Parks and Recreation and Department of Development, Roanoke County.

Park and Recreation Activities and Facilities

There are thirty-five total recreation sites that are managed by Roanoke County. Twenty-seven of these sites have playground areas, none have swimming pools. Of the seventeen sites which have tennis courts, thirteen also have lighting apparatus. Walrond Park, located in the northern portion of the County, has the most amenities, Sugar Loaf Mountain Park has the fewest. A detailed profile of each park site is presented in the table **Park and Recreation Activity and Facility Inventory.**

Current and Projected Activity Demands

In 1982, almost 47 percent of the population of Roanoke County participated in picnicking activities. Swimming, softball, baseball, basketball, bicycling, jogging, hiking, camping, and tennis were also favored activities,

Parks and Recreation Activity and Facility Inventory

Facility	Acreage	Classification	Picnic Tables	Picnic Shelters	Comfort Station	Playground	Trail	Tennis Courts	Softball - Baseball Field	Outdoor Basketball Court	Football Field	Soccer Field	Fishing	Amphitheater	Concession	Indoor Meeting Facility	Indoor Gym	Tent Camping	Swimming
Brookside	20.0	Community Park	x			x			x	x									
Clearbrook Park & Elementary	7.8	Neighborhood Park	x	x	x	x		x	x	x		x			x	x	x		
Catawba Center	2.8	Mini Park	x			x				x						x			
Garst Mill Park	27.0	Community Park	x	x	x	x		x(LF)	x	x									
Glenvar Park, Elementary, High School	65.25	District Park				x	x	x(LF)	x		x(LF)					x	x	x	
McVitty Park	15.0	Neighborhood Park							x						x				
Mt. Pleasant Park	10.0	Neighborhood Park	x	x	x	x		x(LF)	x	x		x							
Ogden Recreation Center	3.0	Mini Park	x					x(LF)	x	x						x			
Craig Community Center	5.0	Neighborhood Park				x				x						x			
Penn Forest Park & Elementary	12.25	Neighborhood Park	x	x	x	x	x	x(LF)	x(LF)	x	x(LF)	x(LF)			x	x	x		
Shamrock Park	12.0	Neighborhood Park	x		x	x			x			x			x				

Facility	Acreage	Classification	Picnic Tables	Picnic Shelters	Comfort Station	Playground	Trail	Tennis Courts	Softball - Baseball Field	Outdoor Basketball Court	Football Field	Soccer Field	Fishing	Amphitheater	Concession	Indoor Meeting Facility	Indoor Gym	Tent Camping	Swimming
Stonebridge Park & William Byrd H.S.	56.25	District Park	x	x	x	x	x	x(LF)	x(LF)	x	x(LF)	x			x	x			
Walrond Park	38.0	Community Park	x	x	x	x	x	x(LF)	x(LF)		x(LF)	x	x	x	x	x			
Whispering Pines	10.0	Neighborhood Park	x			x			x										
Sugar Loaf Mountain Park	47.2	Community Park															x		
Vinton Recreation Center (L)	4.0	Mini Park		x				x(LF)	x(LF)	x(LF)				x	x	x			
Gearhart Park (L)	9.0	Neighborhood Park	x	x	x	x		x(LF)	x	x(LF)					x	x			
Gladetown Park (L)	1.0	Mini Park	x			x				x(LF)									
Dundee Park (L)	5.0	Neighborhood Park	x	x	x	x				x									
Arnold Burton Voc. Tech.	2.5	Mini Park							x(LF)										
Back Creek Elementary	3.4	Mini Park				x			x	x		x				x	x		
Bent Mountain Elementary	1.6	Mini Park	x			x		x(LF	x	x						x	x		

Facility	Acreage	Classification	Picnic Tables	Picnic Shelters	Comfort Station	Playground	Trail	Tennis Courts	Softball - Baseball Field	Outdoor Basketball Court	Football Field	Soccer Field	Fishing	Amphitheater	Concession	Indoor Meeting Facility	Indoor Gym	Tent Camping	Swimming
Burlington Elementary	4.95	Mini Park			x		x(LF)	x			x				x	x			
Cave Spring Elementary & Junior H.S.	5.90	Neighborhood Park			x		x	x	x	x(LF)					x	x			
Cave Spring H.S.	2.05	Mini Park				x	x(LF)	x		x					x	x			
East Vinton Elementary	5.75	Neighborhood Park			x						x				x	x			
Fort Lewis Elementary	3.15	Mini Park			x			x	x						x	x			
Glen Cove Elementary, Roanoke County Occupational School, Cove Road Recreation Center	12.5	Neighborhood Park	x		x	x									x	x			
Green Valley Elementary	4.75	Mini Park			x			x(LF)	x					x	x	x			
Hidden Valley Jr.	5.0	Neighborhood Park				x		x(LF)			x(LF)			x	x	x			

Facility	Acreage	Classification	Picnic Tables	Picnic Shelters	Comfort Station	Playground	Trail	Tennis Courts	Softball - Baseball Field	Outdoor Basketball Court	Football Field	Soccer Field	Fishing	Amphitheater	Concession	Indoor Meeting Facility	Indoor Gym	Tent Camping	Swimming
Mason's Cove Elementary	2.0	Mini Park			x			x	x						x	x			
Mountain View Elementary	5.3	Neighboorhood Park			x		x	x	x						x	x			
Northside Jr. & H. S., Southview Elementary	13.55	Neighboorhood Park					x(LF)	x		x(LF)	x				x	x			
William Byrd Jr. H. S.	2.25	Mini Park			x			x			x(LF)				x	x			
Oak Grove Elementary	2.5	Mini Park	x	x	x	x		x	x(LF)	x				x	x	x			
Total - 35 sites	427.5 acres		17	10	10	27	7	17	27	21	7	12	1	2	10	25	19	2	0

Notes: (L) Leased (LF) Lighted Field

Hardy Road and Roland E. Cook Elementary Schools have small playgrounds and indoor gym facilities.

Source: Division of Park and Recreation Department of Development

attracting from 20 to 40 percent of the County's residents (see table, **Current and Projected Activity Demands, Roanoke County, 1983-2003).**

In 1983, the units of demand for basketball, tennis, horseback riding and ice skating (goals, courts, miles of trail, and rinks) were met or exceeded by either Roanoke County or other public or private sector agencies operating within the County. Of these demands, horseback riding and ice skating were satisfied entirely by the private sector, basketball was satisfied totally by Roanoke County. Although neither the County nor any other public or private sector agencies operating within the County totally satisfied the demands of bikers, joggers, fishermen, hikers, campers, motorcyclists, hunters, water and snow skiers, golfers, or sailors, most users are willing to travel between thirty minutes and one hour to satisfy their demands for these activities (see table, **Acceptable Travel Times to Recreational Activities).** Facilities at Carvin's Cove, Smith Mountain Lake, the Blue Ridge Parkway, and the Jefferson National Forest were included in distinguishing between total local need (not satisfied by Roanoke County or any other public or private sector agency operating within the County) and total remaining need. (See table, **Current and Projected Activity Demands, 1983-2003, for greater detail).**

All units of demand for all recreational activities are expected to increase significantly through the year 2003. Although the private sector may satisfy many of these demands, Roanoke County will have the responsibility of providing those facilities such as tennis courts, softball fields, and swimming pools that are typically neighborhood in character. The principles and standards component of the Comprehensive Development Plan will assist in further establishing levels of recreation service that recognize both public sector capabilities and citizen demand (see also Appendix F).

Current and Projected Activity Demands

Roanoke County, 1983 - 2003

Activity	% of Local Population Participating	Units of Demand[1] 1983	1993	2003	Units	A Provided by Roanoke County	B Provided by Other Public or Private Sector Agencies in Roanoke County	County Need 1983 - Not Satisfied by A & B	Total[2] Remaining Need 1983	Comments
Picnicking	46.99	372	461	514	Tables	210	59	103	53 tables	49% will travel more than 30 minutes
Swimming/ Sunbathing	40.62	24	30	34	Acres of beach	0	1	23	11 acres of beach	53% will travel more than 30 minutes
Pool Swimming	36.99	16	19	22	Pools	0	15	1	0	25% will travel 15-30 minutes
Softball/ Baseball	35.91	41	50	56	Fields	41	0	0	0 fields	
Basketball	30.42	76	94	105	Goals	92	0	0	0	
Bicycling	29.45	102	126	141	Miles of trail	0	14	88	0	Do not require special facilities

Activity	% of Local Population Participating	Units of Demand[1] 1983	1993	2003	Units	A Provided by Roanoke County	B Provided by Other Public or Private Sector Agencies in Roanoke County	County Need 1983 - Not Satisfied by A & B	Total[2] Remaining Need 1983	Comments
Jogging	29.28	67	83	93	Miles of trail	1.4	0	65.6	0	Do not require special facilities
Fishing	29.14	1,267	1,570	1,753	Acres	1	0	1,266	0	Adequate facilities within 30 minutes
Hiking/ Backpacking	23.32	64	80	89	Miles of trail	7.4	27	29.6	0	57% will travel more than one hour
Camping	22.41	685	849	947	Campsites	10	223	452	0	60% will travel more than one hour
Tennis	20.81	69	85	95	Courts	52	20	0	0	
Power Boating	15.08	2,470	3,061	3,417	Boating acres	0	0	2,470	455 boating acres	60% will travel more than 30 minutes

Activity	% of Local Population Participating	Units of Demand[1] 1983	1993	2003	Units	A Provided by Roanoke County	B Provided by Other Public or Private Sector Agencies in Roanoke County	County Need 1983 - Not Satisfied by A & B	Total[2] Remaining Need 1983	Comments
Soccer	14.64	24	29	33	Fields	13	0	11	11	
Football	13.07	19	24	27	Fields	8	0	11	11	
Motorcycle Off-Road	13.00	28	35	39	Miles of trail	0	0	28	0	Do not require special facilities
ORV Use 4-Wheel Drive	12.89	9	11	13	Miles of trail	0	0	9	0	Do not require special facilities
Hunting	12.00	36,937	45,766	51,086	Hunting acres	0	9,849	27,088	0	83% will travel less than one hour
Water Skiing	8.28	2,441	3,025	3,376	Acres	0	0	2,441	0	51% will travel over one hour
Golf	6.74	2	3	4	18 Hole Courses	0	2	0	0	79% will travel less than 30 minutes

Activity	% of Local Population Participating	Units of Demand[1] 1983	1993	2003	Units	A Provided by Roanoke County	B Provided by Other Public or Private Sector Agencies in Roanoke County	County Need 1983 - Not Satisfied by A & B	Total[2] Remaining Need 1983	Comments
Snow Skiing	5.10	4	5	5	Acres of Slope	0	0	4	0	will travel over 1 hour
Ice Skating	4.25	.6	.7	.8	Rink	0	1	0	0	
Horseback Riding	4.23	16	20	23	Miles of trail	0	67	0	0	
Sailing	2.58	58	72	80	Acres	0	0	58	0	87% will travel more than 30 minutes

[1]Demand calculated as the total number of activity days (A) for that activity generated during the prime season, multiplied by the percentage of the activity that occurs on the design day (D) divided by the number of weeks in the season (W) divided by the facility capacity (C) multiplied by the turnover rate (T), equals the number of facilities required to meet design day demand (F). The formula is: $\frac{AD}{WCT} = F$

[2]NOTES: Total Remaining Need reflects availability of regional, state, or national facilities within an acceptable travel time as noted. Does not include neighborhood, community or district facilities in the adjacent localities. Assumes that each locality is responsible for providing a reasonable amount of recreation opportunity for its own residents. Assumes that regional facilities such as Carvins Cove or Smith Mountain Lake are shared by populations of several localities.

Source: Commission of Outdoor Recreation, Commonwealth of Virginia
Division of Parks and Recreation, Roanoke County
Department of Development, Roanoke County

Acceptable Travel Times to Recreational Activities

Roanoke - Lynchburg Areas

ACTIVITY	PERCENT AND TIME TRAVEL TO PARTICIPATE
Picnicking	51% - Less than 30 minutes
Swimming Outdoors/Sunbathing	47% - Less than 30 minutes 53% - Over 30 minutes
Pool Swimming	82% - Less than 30 minutes 57% - Less than 15 minutes
Bicycling for Pleasure	82% - Less than 30 minute
Jogging	88% -Less than 30 minutes
Fishing	47% - Over 30 minutes 53% - 30 minutes or less
Hiking/Backpacking	57% - One hour or more
Camping	60% - One hour or more
Basketball	70% - Less than 15 minutes
Softball/Baseball	86% - Less than 30 minutes 52% - Less than 15 minutes
Power Boating	35% - Over one hour 25% - Over 30 minutes
ORV Use Motorcycle	63% - Less than 15 minutes
ORV Use 4-Wheel	57% - Less than 30 minutes
Hunting	83% - Less than one hour
Tennis	68% - Less than 15 minutes
Football	68% - Less than 15 minutes
Water Skiing	51% - Over 1 hour
Golf	79% - Less than 30 minutes
Canoeing	52% - Over 30 minutes 33% - Over one hour
Snow Skiing	
Soccer	72% - Less than 15 minutes
Ice Skating	72% - Less than 15 minutes
Horseback Riding	71% - Less than 30 minutes
Sailing	58% - Over 30 minutes 29% - Over one hour

Source: Virginia Commission of Outdoor Recreation

Administration

The County of Roanoke and the cities of Roanoke and Salem are separate and independent governmental entities. Virginia counties are unincorporated administrative subdivisions of the State created by law and governed by an elected board of supervisors. The Roanoke County Board of Supervisors consists of members elected from each of the five election districts for a four-year term. The board selects one of its members to serve as chairman. A county administrator oversees the general administrative responsibilities of the County.

The Town of Vinton is an independent incorporated jurisdiction within Roanoke County. The citizens of Vinton elect a town council and a mayor. A town manager directs the operation of the town.

The Roanoke County Administration Center is located in the Cave Spring area, one-quarter mile north of the intersection of U. S. 221 and VA Route 419. The administrative offices of the School Board, the Sheriff's Department, and the Clerk of the Court are located in Salem, the County Seat.

CHAPTER 8

UTILITY SERVICES

UTILITY SERVICES

The Utility Services chapter of the Roanoke County Comprehensive Development Plan will examine water and sewerage systems and the current and projected demand for service from these facilities. The County's existing and future solid waste management needs will be defined.

Water Systems

Overview

Approximately 63 percent of Roanoke County's (excluding the Town of Vinton) 1983 population was served by water supplied from a publicly operated system.[1] Of these persons, 51 percent were served by wells operated by the County, 38 percent obtained water through the bulk purchase agreement with the City of Roanoke, 7 percent were served by wells operated by the Town of Vinton, and 4 percent received water through the bulk purchase contract with the City of Salem.

All water produced by Roanoke County is obtained from seventy-four operating wells located in the urbanized portions of the County. An additional seven wells are not used because of contamination, depletion of groundwater reserves, or a lack of demand. The combined pumping capacity of these wells is 7.1 million gallons per day (MGD). The safe yield established by the Virginia State Water Control Board (SWCB) is only 2.25 MGD. In 1983, County residents consumed an average of 2.62 MGD produced by these wells.

Roanoke City owns and operates a public water supply system that consists of Carvin's Cove Reservior Water Treatment Plant, Falling Creek

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1. 99.8 percent of the households in the Town of Vinton are served by a public water system.

Reservoir/Beaverdam Reservoir Water Treatment Plant, and Crystal Springs. The combined safe yield capacity of these sources is 25.0 MGD. The treatment capacity, as established by the SWCB, limits the system to 23.0 MGD. In 1983 Roanoke County residents consumed an average of 2.16 MGD produced by the City's facilities.

Salem City owns and operates a public water supply system dependant upon raw water obtained from the Roanoke River. Two filtration plants with a combined rated treatment capacity of 8.0 MGD process finished water for City and west County residents. The newest of the two plants, which is located in Roanoke County, has a rated capacity of 3.0 MGD but may be expanded to 15.0 MGD. The current safe yield capacity of the system is 5.0 MGD. From this amount, County residents consumed an average of .169 MGD in 1983.

The Town of Vinton owns and operates a public water supply system consisting of six wells with a combined pumping capacity of 3.0 MGD. The current safe yield of the system as established by the SWCB is 1.7 MGD. Residents in the Vinton community planning area, as well as the Town, are served by this system.

Roanoke County Water Supply and Demand[1]

The Roanoke Valley Water Supply Committee has established that the combined finished water capacity of the facilities operated by Roanoke County, the Town of Vinton, and the cities of Salem and Roanoke is 36.5 MGD. The SWCB has established a lower figure of 31.95 MGD.

The combined average daily total demand for publicly supplied water in Roanoke County, the Town of Vinton, and the cities of Salem and Roanoke

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1. Roanoke Valley defined as Roanoke County, Town of Vinton, cities of Salem and Roanoke.

will range from 28 MGD in 1990 to 65.58 MGD in 2040. With existing supplies, the deficit in 2040 will be approximately 30 MGD. The table, **Water Demand - Water Supply,** summarizes these findings.

Water Demand - Water Supply

1990 - 2040

	Average Daily Demand					
Locality	1990	2000	2010	2020	2030	2040
Roanoke County	5.0	10.18	12.51	14.71	16.64	17.58
Town of Vinton	1.5	2.3	2.5	3.8	4.2	4.7
City of Salem	5.6	6.8	8.2	10.0	12.1	14.5
City of Roanoke	15.9	16.7	18.7	21.3	24.6	28.8
Total Daily Demand	28.0	35.98	41.91	49.81	57.54	65.58
Total Daily Supply	36.5	36.5	36.5	36.5	36.5	36.5
Variance	+8.5	+.52	-5.41	-13.31	-21.04	-29.08

1. All figures are MGD.

Source: Roanoke Valley Water Supply Committee

Roanoke County Water Demand 1983 - 2043

Water demand was determined for ten of twelve community planning areas for the period 1983-2043. Bent Mountain and Catawba were omitted because of topographic constraints and sparse populations. Demands were based on a consumption rate of 150 gallons per capita per day. It was established that of this total, 40 percent would be used for domestic purposes, 21.3 percent for industrial purposes, 14.0 percent for commercial uses, and 10.0 percent for public consumption. The remaining 14.7 percent was attributed to system loss and waste.

It has been anticipated that by the end of the design period, there will be two service areas supplying the Roanoke Valley's water needs. Each of the ten planning areas has been assigned to either the City of Salem or City of Roanoke service area.

Roanoke County's publicly supplied water demand has been projected to increase from 6.47 MGD in 1983 to 10.62 MGD in the year 2003. By the year 2043 the County's publicly supplied water demand is anticipated to be 17.95 MGD.

The following twelve pages document the anticipated publicly supplied water requirements of each of the community planning areas to be served by the year 2043.

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	1,936	3,372	2,931	4,837	6,724	7,869	8,621
Percent Served	4	2	2	41	61	81	100[4]
Population Served [1]	77	67	59	1,983	4,102	6,374	8,621
Residential Demand 60 GPCPD [2]	4,620	4,020	3,540	118,980	246,120	382,440	517,260
Industrial Demand 32 GPCPD	2,464	2,144	1,888	63,456	131,264	203,968	275,872
Commercial Demand 21 GPCPD	1,617	1,407	1,239	41,643	86,142	133,854	181,041
Public Demand 15 GPCPD	1,155	1,005	885	29,745	61,530	95,610	129,315
System Loss 22 GPCPD	1,694	1,474	1,298	43,626	90,244	140,228	189,662
TOTAL DEMAND [3] 150 GPCPD	11,550	10,050	8,850	297,450	615,300	956,100	1,293,150

Notes:

[1] Assumes that 100 percent of per decade population growth, 2003-2043, will be served by public water system. Assumes that existing public water system will not be expanded until after 1993.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	1,903	4,385	5,561	5,580	5,914	5,850	5,773
Percent Served	32	70	76	82	88	94	100[4]
Population Served [1]	609	3,070	4,226	4,576	5,204	5,499	5,773
Residential Demand 60 GPCPD [2]	36,540	184,200	253,560	274,560	312,240	329,940	346,380
Industrial Demand 32 GPCPD	19,488	98,240	135,232	146,432	166,528	175,968	184,736
Commercial Demand 21 GPCPD	12,789	64,470	88,746	96,096	109,284	115,479	121,233
Public Demand 15 GPCPD	9,135	46,050	63,390	68,640	78,060	82,485	86,595
System Loss 22 GPCPD	13,398	67,540	92,972	100,672	114,488	120,978	127,006
TOTAL DEMAND [3] 150 GPCPD	91,350	460,500	633,900	686,400	780,600	824,850	865,950

Notes:

[1] Assumes that 100 percent of per decade population growth, 1983-2043, will be served by public water system.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

BONSACK PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	15,667	17,458	17,785	17,118	16,931	16,751	16,643
Percent Served	69	72	78	84	90	96	100[4]
Population Served [1]	10,810	12,570	13,872	14,379	15,238	16,081	16,643
Residential Demand 60 GPCPD [2]	648,600	754,200	832,320	862,740	914,280	964,860	998,580
Industrial Demand 32 GPCPD	345,920	402,240	443,904	460,128	487,616	514,592	532,576
Commercial Demand 21 GPCPD	227,010	263,970	291,312	301,959	319,998	337,701	349,503
Public Demand 15 GPCPD	162,150	188,550	208,080	215,685	228,570	241,215	249,645
System Loss 22 GPCPD	237,820	276,540	305,184	316,338	335,236	353,782	366,146
TOTAL DEMAND [3] 150 GPCPD	1,621,500	1,885,500	2,080,800	2,156,850	2,285,700	2,412,150	2,496,450

Notes:

[1] Assumes that 100 percent of per decade population growth, 1983-2043, will be served by public water system.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

CAVE SPRING PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	1,650	2,371	2,152	3,612	5,009	5,862	6,421
Percent Served	0	8	9	46	64	82	100[4]
Population Served [1]	0	190	194	1,662	3,206	4,807	6,421
Residential Demand 60 GPCPD [2]	0	11,400	11,640	99,720	192,360	288,420	385,260
Industrial Demand 32 GPCPD	0	6,080	6,208	53,184	102,592	153,824	205,472
Commercial Demand 21 GPCPD	0	3,990	4,074	34,902	67,326	100,947	134,841
Public Demand 15 GPCPD	0	2,850	2,910	24,930	48,090	72,105	96,315
System Loss 22 GPCPD	0	4,180	4,268	36,564	70,532	105,754	141,262
TOTAL DEMAND [3] 150 GPCPD	0	28,500	29,100	249,300	480,900	721,050	963,150

Notes:

[1] Assumes that 100 percent of per decade population growth, 2003-2043, will be served by public water system. Assumes that public water system will be installed before 1993 to serve approximately 190 people currently without adequate groundwater supplies.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

CLEARBROOK PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	7,187	7,187	14,092	17,086	19,856	20,818	21,264
Percent Served	35	50	75	79	86	93	100[4]
Population Served [1]	2,515	3,594	10,569	13,498	17,076	19,361	21,264
Residential Demand 60 GPCPD [2]	150,900	215,640	634,140	809,880	1,024,560	1,161,660	1,275,840
Industrial Demand 32 GPCPD	80,480	115,008	338,208	431,936	546,432	619,552	680,448
Commercial Demand 21 GPCPD	52,815	75,474	221,949	283,458	358,596	406,581	446,544
Public Demand 15 GPCPD	37,725	53,910	158,535	202,470	256,140	290,415	318,960
System Loss 22 GPCPD	55,330	79,068	232,518	296,956	375,672	425,942	467,808
TOTAL DEMAND [3] 150 GPCPD	377,250	539,100	1,585,350	2,024,700	2,561,400	2,904,150	3,189,600

Notes:

[1] Assumes that 100 percent of per decade population growth, 1983-2043, will be served by public water system.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	2,096	2,096	2,096	5,064	8,737	12,394	
Percent Served	0	0	0	63	75	87	100[4]
Population Served [1]	0	0	0	3,521	3,798	7,601	12,394
Residential Demand 60 GPCPD [2]	0	0	0	211,260	227,880	456,060	743,640
Industrial Demand 32 GPCPD	0	0	0	112,672	121,536	243,232	396,608
Commercial Demand 21 GPCPD	0	0	0	73,941	79,758	159,621	260,274
Public Demand 15 GPCPD	0	0	0	52,815	56,970	114,015	185,910
System Loss 22 GPCPD	0	0	0	77,462	83,556	167,222	272,668
TOTAL DEMAND [3] 150 GPCPD	0	0	0	528,150	569,700	1,140,150	1,859,100

Notes:

[1] Assumes that 100 percent of per decade population growth, 2003-2043, will be served by public water system. Assumes that public water system will be installed after 1993.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

MASON'S COVE PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	4,000	4,000	4,000	6,647	8,888	10,208	11,044
Percent Served	20	20	20	52	68	84	100[4]
Population Served [1]	800	800	800	3,456	6,044	8,575	11,044
Residential Demand 60 GPCPD [2]	48,000	48,000	48,000	207,360	362,640	514,500	662,640
Industrial Demand 32 GPCPD	25,600	25,600	25,600	110,592	193,408	274,400	353,408
Commercial Demand 21 GPCPD	16,800	16,800	16,800	72,576	126,924	180,075	231,924
Public Demand 15 GPCPD	12,000	12,000	12,000	51,840	90,660	128,625	165,660
System Loss 22 GPCPD	17,600	17,600	17,600	76,032	132,968	188,650	242,968
TOTAL DEMAND [3] 150 GPCPD	120,000	120,000	120,000	518,400	906,600	1,286,250	1,656,600

Notes:

[1] Assumes that 100 percent of per decade population growth, 2003-2043, will be served by public water system. Assumes that existing public water system will not be expanded until after 1993.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

MT. PLEASANT PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	17,237	23,482	24,990	22,542	21,855	21,199	20,802
Percent Served	83	88	89	92	95	98	100[4]
Population Served [1]	14,307	20,664	22,241	20,739	20,762	20,775	20,802
Residential Demand 60 GPCPD [2]	858,420	1,239,840	1,334,460	1,244,340	1,245,720	1,246,500	1,248,120
Industrial Demand 32 GPCPD	457,824	661,248	711,712	663,648	664,384	664,800	665,664
Commercial Demand 21 GPCPD	300,447	433,944	467,061	435,519	436,002	436,275	436,842
Public Demand 15 GPCPD	214,605	309,960	333,615	311,085	311,430	311,625	312,030
System Loss 22 GPCPD	314,754	454,608	489,302	456,258	456,764	457,050	457,644
TOTAL DEMAND [3] 150 GPCPD	2,146,050	3,099,600	3,336,150	3,110,850	3,114,300	3,116,250	3,120,300

Notes:

[1] Assumes that 100 percent of per decade population growth, 1983-2043, will be served by public water system.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.
All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

PETERS CREEK PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	3,300	4,992	5,477	4,789	4,597	4,413	4,302
Percent Served	94	95	96	97	98	99	100[4]
Population Served [1]	3,102	4,742	5,258	4,645	4,505	4,369	4,302
Residential Demand 60 GPCPD [2]	186,120	284,520	315,480	278,700	270,300	262,140	258,120
Industrial Demand 32 GPCPD	99,264	151,744	168,256	148,640	144,160	139,808	137,664
Commercial Demand 21 GPCPD	65,142	99,582	110,418	97,545	94,605	91,749	90,342
Public Demand 15 GPCPD	46,530	71,130	78,870	69,675	67,575	65,535	64,530
System Loss 22 GPCPD	68,244	104,324	115,676	102,190	99,110	96,118	94,644
TOTAL DEMAND [3] 150 GPCPD	465,300	711,300	788,700	696,750	675,750	655,350	645,300

Notes:

[1] Assumes that 100 percent of per decade population growth, 1983-2043, will be served by public water system.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.
Does not include the Town of Vinton.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

POPULATION/WATER DEMAND PROJECTIONS

VINTON PLANNING AREA

YEAR	1983	1993	2003	2013	2023	2033	2043
Population	11,272	13,289	13,694	12,931	12,714	12,511	12,387
Percent Served	97	98	99	100	100	100	100[4]
Population Served [1]	10,934	13,023	13,557	12,931	12,714	12,511	12,387
Residential Demand 60 GPCPD [2]	656,040	781,380	813,420	775,860	762,840	750,660	743,220
Industrial Demand 32 GPCPD	349,888	416,736	433,824	413,792	406,848	400,352	396,384
Commercial Demand 21 GPCPD	229,614	273,483	284,697	271,551	266,994	262,731	260,127
Public Demand 15 GPCPD	164,010	195,345	203,355	193,965	190,710	187,665	185,805
System Loss 22 GPCPD	240,548	286,506	298,254	284,482	279,708	275,242	272,514
TOTAL DEMAND [3] 150 GPCPD	1,640,100	1,953,450	2,033,550	1,939,650	1,907,100	1,876,650	1,858,050

Notes:

[1] Assumes that 100 percent of per decade population growth, 1983-2043, will be served by public water system.
[2] GPCPD: Gallons per capita per day.
[3] Peak demand factor of 1.35 not included.
[4] Assumes that 100 percent of total population will be served by public water system by year 2043.

All demand units are expressed as gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

PLANNING AREAS SERVED	1983	1993	2003	2013	2023	2033	2043
Back Creek	11,550	10,050	8,850	297,450	615,300	956,100	1,293,150
Bonsack	91,350	460,500	633,900	686,400	780,600	824,850	865,950
Cave Spring	1,621,500	1,885,500	2,080,800	2,156,850	2,285,700	2,412,150	2,496,450
Clearbrook	0	28,500	29,100	249,300	480,900	721,050	963,150
Mt. Pleasant	120,000	120,000	120,000	518,400	906,600	1,286,250	1,656,600
Peters Creek	2,146,050	3,099,600	3,336,150	3,110,850	3,114,300	3,116,250	3,120,300
Vinton	465,300	711,300	788,700	696,750	675,750	655,350	645,300
Windsor Hills [1]	1,476,090	1,758,105	1,830,195	1,745,685	1,716,390	1,688,985	1,672,245
TOTAL DEMAND	5,931,840	8,073,555	8,827,695	9,461,685	10,575,540	11,660,985	12,713,145

[1] Equals 90 percent of total planning area demand.

Figures are in gallons per day.

Source: Roanoke County, Department of Development and Department of Public Facilities

PLANNING AREAS SERVED	1983	1993	2003	2013	2023	2033	2043
Glenvar	377,250	539,100	1,585,350	2,024,700	2,561,400	2,904,150	3,189,600
Mason's Cove	0	0	0	528,150	569,700	1,140,150	1,859,100
Windsor Hills [1]	164,010	195,345	203,355	193,965	190,170	187,665	185,805
TOTAL DEMAND	541,260	734,445	1,788,705	2,746,815	3,321,810	4,231,965	5,234,505

[1] Equals 10 percent of total planning area demand.

Figures are in Gallons Per Day.

Source: Roanoke County, Department of Development and Department of Public Facilities

ROANOKE COUNTY WATER SUPPLY

WATER DEMAND PROJECTIONS

SALEM SERVICE AREA

Distribution System

Roanoke County's existing water distribution system was evaluated according to pipe diameter. Water lines six inches or more in diameter were defined as adequate, lines less than six inches in diameter were defined as inadequate. The Code of Virginia requires the installation of water lines six inches or more in diameter to insure that fire flow is adequate.

Approximately 60 percent of the water lines maintained by Roanoke County are inadequate as defined above. The wall map, **Existing Water Systems,** on display at the Roanoke County Administration Center, describes the distribution system in greater detail.

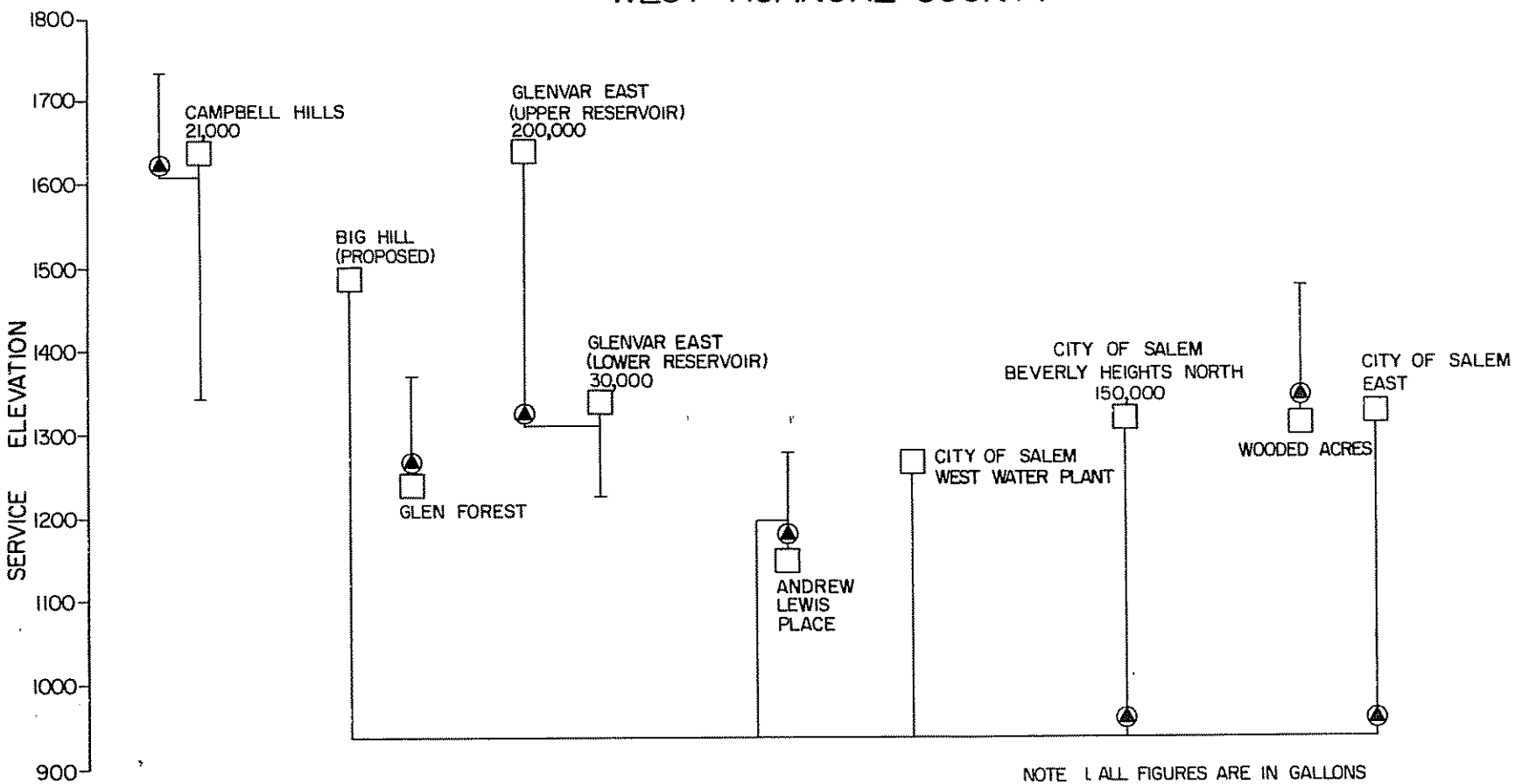
Most of the County's systems have been looped to provide better pressure and service; however, some "dead-end" branches do exist. In many of these cases, the County's topography has prevented the construction of a gridiron system.

Most of the systems in the southwest service area have been interconnected to provide better service and to take advantage of several plentiful well sources, as well as the bulk supplies available from the City of Roanoke. Figures 8-A, 8-B, and 8-C diagram the existing distribution systems, existing storage facilities, and service elevations for the north, southwest, and west County water service areas.

Fire Flow

Fire protection, rather than domestic consumption, should determine the dimensions of the distribution system. The amount of water required for adequate fire control is dependant upon the type of construction and land use in a particular area. In residential districts, the required flow ranges from a

WATER INTERCONNECTIONS
WEST ROANOKE COUNTY



NOTE 1. ALL FIGURES ARE IN GALLONS
2. PRESSURE TANK CAPACITIES NOT SHOWN
3. WELLS AND CAPACITIES NOT SHOWN

□ STORAGE FACILITY (TANK, CONCRETE, OR GROUND STORAGE RESERVOIR)

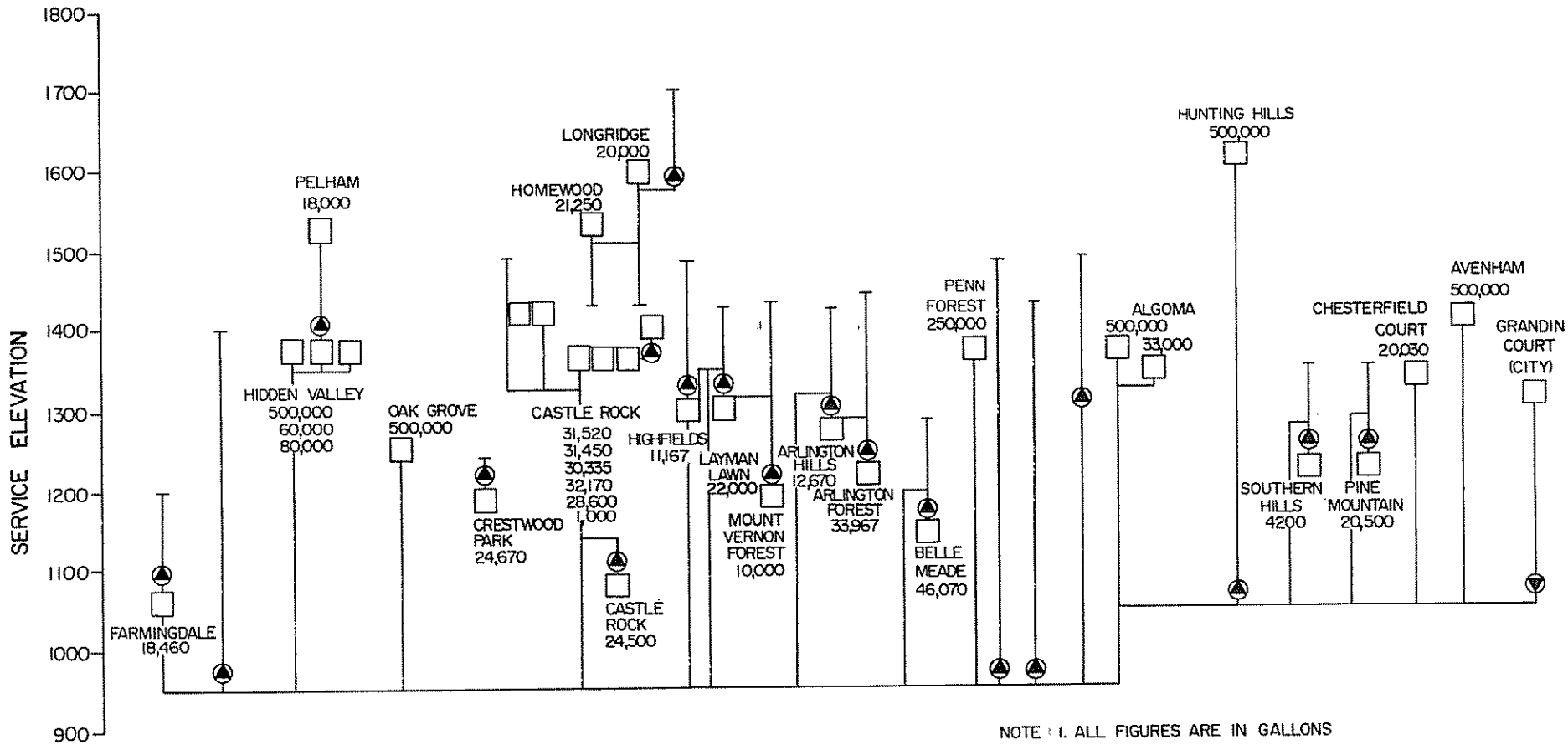
PUMP OR PRESSURE TANK

T HIGHEST ELEVATION OF AVAILABLE WATER

⊥ LOWEST ELEVATION OF AVAILABLE WATER

FIGURE 8-C

WATER INTERCONNECTIONS
SOUTH ROANOKE COUNTY



NOTE : 1. ALL FIGURES ARE IN GALLONS
2. PRESSURE TANK CAPACITIES NOT SHOWN
3. WELLS AND CAPACITIES NOT SHOWN

□ STORAGE FACILITY (TANK, CONCRETE OR GROUND STORAGE RESERVOIR)

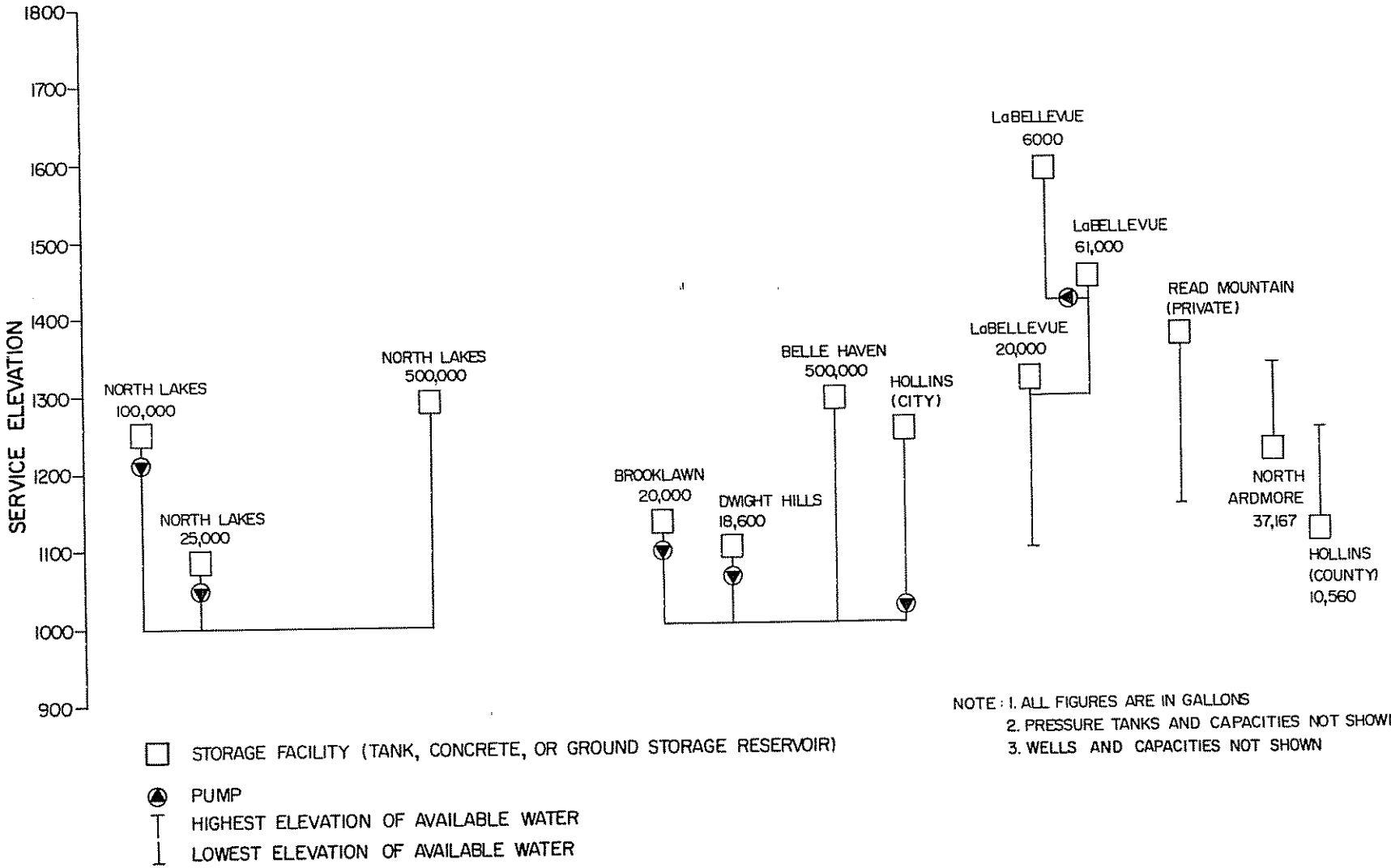
PUMP OR PRESSURE TANK

HIGHEST ELEVATION OF AVAILABLE WATER

LOWEST ELEVATION OF AVAILABLE WATER

FIGURE 8-B

WATER INTERCONNECTIONS
NORTH ROANOKE COUNTY



NOTE : 1. ALL FIGURES ARE IN GALLONS
2. PRESSURE TANKS AND CAPACITIES NOT SHOWN
3. WELLS AND CAPACITIES NOT SHOWN

FIGURE 8-A

minimum of 500 gallons per minutes (GPM) for single-family structures to a maximum of 2,500 GPM for multi-family developments. A single hose stream is rated at 250 GPM. At least ten hose connections should be available to suppress a fire in a large multi-family development.

Existing fire flow capacities were analyzed and mapped for all areas within Roanoke County, except the Town of Vinton. For each hydrant, the following flow capabilities were established:

Category 1 - hydrant flowing 0-499 gallons per minute

Category 2 - hydrant flowing 500-999 gallons per minute

Category 3 - hydrant flowing 1,000-1,499 gallons per minute

Category 4 - hydrant flowing 1,500 gallons per minute or more

Category 5 - hydrant out of service or flowing untested capacities

Twenty-six hydrants in the southwest service area were flowing 0-499 gallons per minute while an additional twenty-three were out of service or flowing untested capacities. In the north County service area these figures were four and twenty-three, respectively. In the Vinton service area one hydrant was flowing 0-499 gallons per minute, while an additional nineteen were out of service or flowing untested capacities. Ten hydrants in the west County service area were out of service or flowing untested capacities.

Although a hydrant service radius of 500 feet is desirable, a radius of 1,000 feet is acceptable. Using the latter measurement as a standard, the areas within the County currently served by hydrants were evaluated to determine the adequacy of coverage.

Several heavily developed residential areas in the southwest portion and one in the northern part of the County were not within an acceptable distance of a fire hydrant. Many other areas were within the service radius of a hydrant that was either not working or flowing an untested amount.

The wall map, **Existing Fire Flow Capacities**, on display at the Roanoke County Administration Center describes these findings in greater detail.

Storage

Water storage serves three primary purposes: equalization, reserve capacity and fire flow storage.

Equalization is required when consumption exceeds the production rate. As a rule, equalization should be approximately 20 percent of average daily consumption. Emergency reserve storage is the amount of storage required to supplement the distribution system during emergency conditions such as power and equipment failures. A twenty-four reserve is generally adequate. Fire flow storage is determined by the Insurance Services Office (ISO). Recommended standards are three hours of flow at 3,000 GPM for the largest industrial or commercial facility to be served; two hours of flow at 1,000 GPM for several single-family units; and two hours of flow at 500 GPM for one single-family home.

Current storage capacities are as follows:

	North County	Connected to Bulk Supply
North County	1,298,327 gal.	538,600 gal.
South County	3,385,559 gal.	3,319,639 gal.
West County	401,000 gal.	150,000 gal.
Total	5,084,886 gal.	4,008,239 gal.

Source: Roanoke County, Department of Public Facilities

Note: **Current and future storage requirements will be analyzed more completely and contained within an addendum distributed before the final draft is presented.**

Sewerage Systems

The section describing existing sewerage systems was not complete when this document went to print. An addendum will be distributed before the final draft is presented. The addendum will address:

- treatment capabilities
- existing and projected waste water flows
- collection system capabilities
- inflow
- sewer service districts

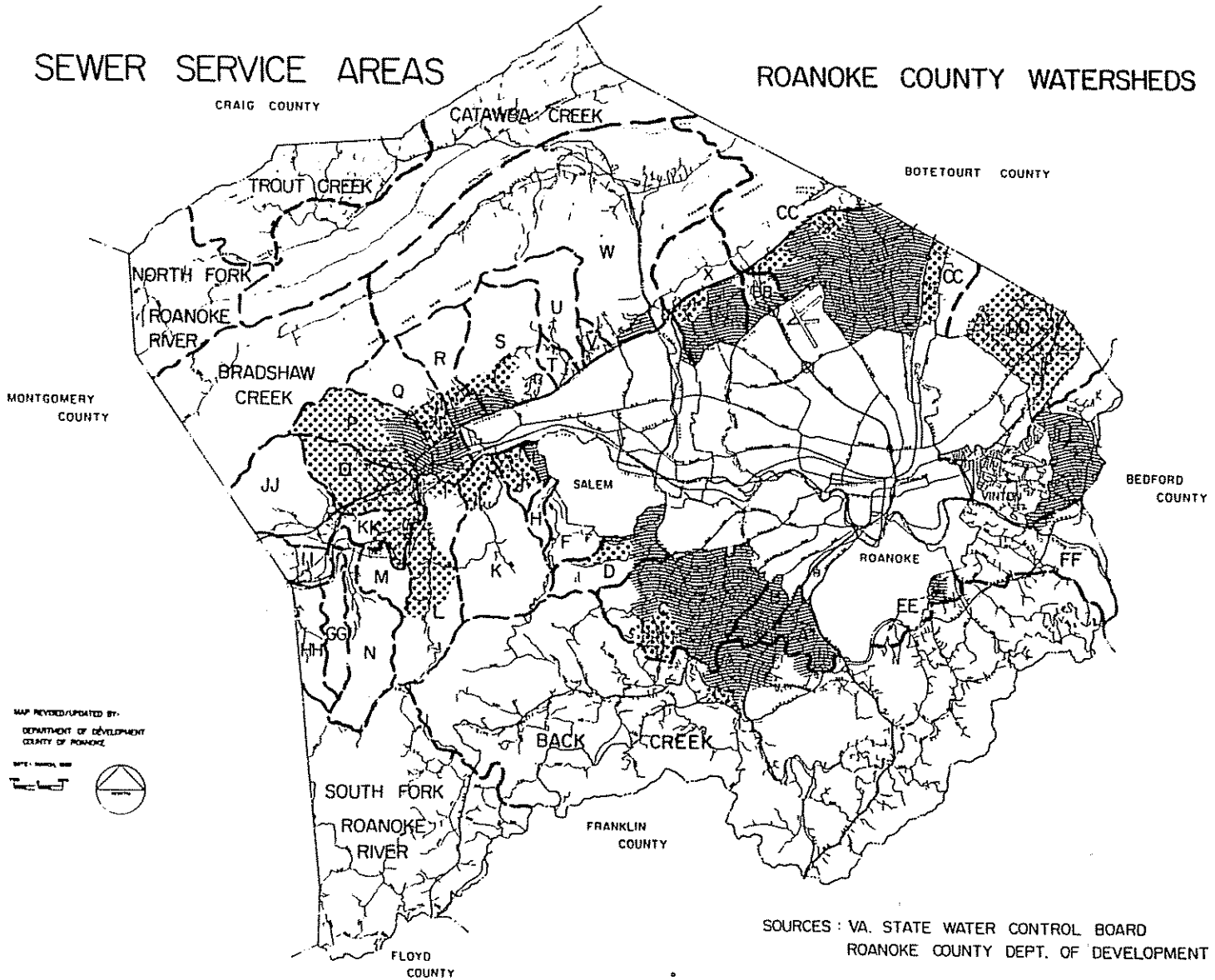

SEWER SERVICE AREAS
ROANOKE COUNTY WATERSHEDS
CRAIG COUNTY
CATAWBA CREEK
TROUT CREEK
BOTETOURT COUNTY
NORTH FORK ROANOKE RIVER
BRADSHAW CREEK
MONTGOMERY COUNTY
SALEM
BEDFORD COUNTY
VINTON
ROANOKE
BACK CREEK
SOUTH FORK ROANOKE RIVER
FRANKLIN COUNTY
FLOYD COUNTY
MAP REVISED/UPDATED BY:
DEPARTMENT OF DEVELOPMENT
COUNTY OF ROANOKE
SOURCES : VA. STATE WATER CONTROL BOARD
ROANOKE COUNTY DEPT. OF DEVELOPMENT
EXISTING SEWER SERVICE AREA
PROPOSED SEWER SERVICE AREA

FIGURE 8-D

Solid Waste Management

Institutional Framework

All levels of government have some responsibility for the disposal of solid wastes. At the federal level the Environmental Protection Agency (EPA), by authority of the Resource Conservation and Recovery Act (RCRA) of 1976, bears the primary responsibility for improving the nation's solid waste disposal practices. The federal government is authorized to provide funding to assist state and local governments to develop solid waste management programs and promote research, development, and demonstrations to expand knowledge and technology related to land disposal and resource conservation. Also RCRA attempts to provide regulatory control over hazardous wastes from generation to disposal. From 1977 to 1981 the federal government has been the major source of funding and information for programs designed to improve solid waste practices to protect public health and the environment. Since 1981, federal solid waste activities authorized under RCRA have been eliminated. RCRA implementation now focuses almost exclusively on the hazardous waste provisions.

On the state level, solid waste management activities are centered in the Department of Health's Division of Solid and Hazardous Waste Management. Chapter 6, Title 32.1, Article 3 of the Code of Virginia specifies the goals for the solid waste disposal system in the state. Among these goals are the provision of adequate solid waste collection and disposal facilities, which assure the protection of public health and the environment and maximize the recovery of materials and energy from the waste stream.

Solid waste management is also a focus of regional planning, mainly as a factor included in the Areawide 208 Water Quality Management Planning program mandated by the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act of 1977. The Fifth Planning District Commission has completed a 208 plan that includes Roanoke County and addresses such areas as residual waste problems and landfilling.

While the federal and state governments provide the overall regulatory structure of solid waste management, the implementation of specific solid waste practices takes place at the regional or local level. For citizens of Roanoke County, solid waste management is the responsibility of the Roanoke Valley Regional Solid Waste Management Board. Created in July, 1975 by the City of Roanoke, Roanoke County, and the Town of Vinton, the Board represents a legal agreement to administer and operate a sanitary landfill to accommodate the solid waste disposal needs of the three jurisdictions. The Board is composed of three representatives from the City of Roanoke, two from Roanoke County, and one from Vinton, whose duties include administering the operation of the landfill, hiring personnel, and purchasing necessary equipment and supplies.

Generation of Solid Waste

Solid waste is a product of all human activity in modern society. The waste stream includes household, commercial, industrial, agricultural, transportaion, and recreational components. The table on the following page outlines the average composition of residential and commercial solid waste. While the table reflects national averages, local variation is generally minimal, and national figures may be viewed as representative of most areas. It is likely, however, that the present composition will change in the future, due to such factors as changes in industrial packaging materials, new technologies resulting in new waste materials, etc.

Changes are likely, not only in the composition of the waste stream, but in its volume as well. The Solid Waste Board has kept weight records at the regional landfill since September, 1976, which are shown in the table, **Regional Landfill Tonnages.** These records indicate a definite decline in waste volume, especially when viewed on a per capita basis. As the table, **Projected Annual Refuse Tonnage** indicates, the present generation rate of 4.0 lbs./capita/day is expected to decline to 3.6 lbs./capita/day by the year 2000, if present trends continue. While future waste volume could be significantly

Composition of Residential/Commercial Waste

	As-Generated Wet-Weight Basis
Paper	29.0
Glass	10.4
Ferrous Metals	8.6
Aluminum	0.8
Other Non-ferrous Metals	0.3
Plastics	3.4
Rubber and Leather	2.6
Textiles	1.6
Wood	3.8
Food Waste	17.8
Yard Waste	20.2
Miscellaneous Inorganics	1.5

Source: EPA, Office of Solid Waste, Resource Recovery Division and Franklin Associates, Ltd., revised January, 1977.

Roanoke Landfill Tonnages

Fisal Year	JURISDICTION: City of Roanoke Tonnage	City of Roanoke % of Total	County of Roanoke Tonnage	County of Roanoke % of Total
1977/78	64,554	63	17,789	17
1978/79	71,307	64	18,135	16
1979/80	73,604	66	18,394	17
1980/81	70,343	66	17,534	16
1981/82	67,380	61	16,827	15
1982/83	47,696	38	17,536	14

Fiscal Year	JURISDICTION: Town of Vinton Tonnage	Town of Vinton % of Total	Private Tonnage	Private % of Total	TOTAL TONNAGE
1977/78	3,363	3	16,818	17	102,524
1978/79	3,790	4	17,880	16	111,112
1979/80	3,771	3	15,644	14	111,413
1980/81	3,730	4	15,264	14	106,871
1981/82	3,580	3	23,170	21	110,957
1982/83	3,718	3	55,175	45	124,125

Projected Annual Refuse Tonnage
Roanoke Valley Region

Year	PCGR (lbs/capita/day)	Projected Population*	Tons Per Year
1985	3.9	179,959	128,100
1990	3.8	188,800	130,900
1995	3.7	193,364	130,600
2000	3.6	199,000	130,700

*Population projections from Virginia Department of Planning and Budget

Source: Director, Roanoke Regional Landfill and Roanoke County, Department of Development

affected by rules and regulations, economic conditions, packaging practices, and numerous other factors, indications point toward at least a gradual decline. This decline could be accelerated by increased activity in recycling waste materials. Resource recovery through the recycling of aluminum, glass, ferrous metals, and other materials has met with only moderate success in recent years, due mainly to limited demand for recycled materials by industry. It would seem only a matter of time, however, before dwindling supplies of virgin materials will make the use of recycleables more attractive.

The Solid Waste Disposal System

The system of solid waste disposal under the jurisdiction of the Roanoke Valley Regional Solid Waste Management Board encompasses both the public and private sectors. Public and private haulers are utilized to collect solid waste and transport it to the regional landfill, located on a 244 acre site on Route 618 near the Blue Ridge Parkway in southeastern Roanoke County. The site is operated as an area fill, using on-site soils for cover material.

In addition to the regional landfill, the Board also uses the services of a private of a private landfill to dispose of demolition wastes and non-putrescible items.

Status of Existing Landfill

As it is currently being utilized, the landfill will be filled to capacity in 1994. When closed, a recreational facility is to be built, including sport fields, playgrounds, nature trails, swimming facilities, par-3 golf course, and river recreational facilities.

In 1981, the Board began to investigate ways to extend the life of the landfill. A consultant's report suggested that conversion to a balefill operation could extend the life of the site by one-third. In addition, by raising the elevation of the completed site by ninety feet an additional six years of use may be gained. This additional elevation would eliminate some, but not all of the recreational uses planned for the site.

As a result of the report, the Board decided to convert to a balefill operation, raise the elevation by 90 feet, and use area A to provide cover material for the additional elevation. Construction of the baler began in the fall of 1982 and began to operate in the fall of 1983. As a result of these actions, the existing landfill is scheduled to close in 1994.

Future Issues in Solid Waste Management in Roanoke County

Solid waste management is a local government function well suited to a regional approach. The existing regional system provides all member communities lower disposal costs than would be possible if each operated a separate facility. However, if this regional approach is to continue, all localities involved, especially Roanoke County, must plan for the time when a new site must be found and developed. This site selection process will certainly focus on sites within Roanoke County. The County will thus be at the center of the almost inevitable conflict that plagues the siting of such facilities. Recognition of the need to locate a new landfill site will be included in the Comprehensive Development Plan within the Future Land Use Component.

Recognizing that the operation of the existing facility, including the promised future development of recreational areas, will have an effect on the siting of the next facility, the County has a strong interest in the management decisions made by the Regional Board. This is especially true of decisions made to extend the life of the current landfill site. The County should make every effort to ensure that actions of the Board are in the best interests of the County.

The projected reductions in the per capital generation of solid wastes should not be treated as a foregone conclusion. These reductions will come about only as a result of well designed programs. In order to reduce the amount of waste landfilled, for economic, political, as well as environmental reasons, the County may wish to consider initiating recycle/waste reduction programs, either unilaterally or with other localities, provide

incentives for private resource recovery programs, or consider the emerging waste-to-energy technologies.

Hazardous Wastes

Hazardous wastes are unwanted substances which, improperly managed, pose a significant threat to human health and the environment. These wastes are primarily comprised or organic chemical compounds recently developed, manufactured, and distributed throughout our country. The recent discovery of public health and environmental damage throughout the nation, as well as in the Roanoke Valley, has brought the management of these wastes under governmental regulation.

While these laws and regulations are national and statewide, and localities are not directly responsible for their administration, pollution damage from hazardous wastes usually occurs at the local level. Municipal water treatment systems have been disabled because of wastes discharged into sewers. Roadsides have been contaminated by "midnight dumpers". Water supplies have been threatened by run-off from poorly operated containment ponds. Groundwater has been threatened by leaching of hazardous wastes by rain. Hazardous wastes have been dumped into conventional solid waste landfills.

Roanoke County has not escaped the damage from inadequate hazardous waste management. The site of Matthews Electroplating Company, near Salem, is the State's first federal "Superfund" cleanup site. It may cost millions to eliminate the threat to local groundwater from chromium wastes.

Role of Localities in HWM

While federal and state agencies are in the process of developing the mechanisms to enforce the new laws designed to reduce likelihood of future damage, they currently do not have the capability to provide effective monitoring of local hazardous waste handling practices. Current regulations and agencies may be able to provide penalties

against violators, but after considerable damage may have occurred. Roanoke County therefore may wish to undertake programs that more actively protect its citizens and environment.

Sources:

Roanoke Valley Regional Sanitary Landfill, prepared for Roanoke Valley Regional Landfill Disposal Board by Thompson and Litton, Inc., Wise, Virginia, September, 1973.

Solid Waste Management Study for the Roanoke Valley Region, prepared for the Roanoke Valley Regional Solid Waste Management Board by Roy F. Weston Inc., Richmond, Virginia, October 14, 1981.

Schematic Design Report, - Solid Waste Baling Facility for the Roanoke Valley Regional Solid Waste Management Board, Mattern and Craig, Roanoke, Virginia, May, 1982.

APPENDIX

Appendix A

Commuting Pattern

	Roanoke County	Roanoke City	Salem	Total
Total Workers Ages 16 years & older	34,316	42,672	11,151	88,139
Employment Location				
Roanoke City - CBD	3,882	5,626	617	10,125
Remainder of Roanoke City	13,311	21,682	3,052	38,045
Salem City	6,876	5,447	5,489	17,812
Vinton Town	1,357	796	33	2,186
Roanoke County	4,044	2,496	677	7,217
Botetourt County	307	500	25	832
Craig County	13	-	13	26
Radford City	96	18	103	217
Blacksburg Town	97	43	50	190
Remainder of Montgomery Co.	125	13	47	185

Note: Columns do not equal total workers
Source: Bureau of the Census

APPENDIX B

LAND USE GUIDE - ROANOKE COUNTY

Residential

Single Family Residential

Two-Family Residential

Multi-Family Residential

- Condominiums
- Townhouses
- Apartments (3 or more units)

Mobile Homes

Retail and Service Commercial generally enclosed in a structure, including:

Motels, Hotels

Restaurants (other than Drive-In)

ABC Store

Night Clubs, Entertainment, Amusements

Barber and Beauty Shops

Furniture Sales, Antique Sales

Office Supplies

Day Care Services

Dry Cleaning/Laundry

Florist

Clothing Store

Hardware Store

Appliance Store

Eggs and Produce Shop

Auto Parts Store

Drug Store

General or Variety Store

Theater

Dance Studio

Ceramic Sales

Taxidermist

General Commercial generally not fully enclosed in a structure, including:

Gas Station

Car Wash

Lumber Sales

Auto, Truck, Boat, Mobile Home, Heavy Equipment Sales

Auto Repair Garages

Veterinary Hospitals

Drive-In Restaurant

Electrical, Plumbing Supply

Public and Employee Parking

Miniature Golf

Heating and Air Conditioning Contractor

Seasonal Produce Sales

Greenhouse and Nursery

Commercial Storage Facilities

Office and Institutional

Banks and other Financial Institutions

Real Estate and Insurance

Attorney

Public Offices

Community Services

Clubs

Churches

Radio and TV Studios

Passenger Transportation Terminals

Utility Company Offices

Railroad Office

Medical Offices

Optometrist

Hospitals

Schools and Colleges

Libraries

Surveyor's Office

Rescue Squad

Tax Office

Chamber of Commerce

Newspaper Office

Telephone Company

Mental Health Facility

Retirement or Special Care Complex

Light Industry

Industrial uses generally enclosed in buildings without extensive outside storage, including:

Wholesale and Warehouse Facilities

Radio and TV Transmission Facilities

Power Substations, Utility Pump Stations

Trucking Terminals, Truck Repair Garage

Public, Transportation, and Utility Company Vehicle and Equipment Storage and Repair Facilities

Water Storage Tank

Welding Shop

Beer Distributor

Bottling Plant

Sheet Metal Fabrication

Equipment Parking

Printing Company

Heavy Industry

Industrial uses generally not fully enclosed in buildings with outside raw material and product storage, including:

Sawmills

Junk Yards

Sewage Treatment Plant

Railroad Switching and Maintenance Yard

Landfill

Steel Manufacturing

Gravel Quarry

Foundry

Parks and Open Space

Park/Playground/Tennis

Cemetery

Game Refuge

Water Supply Reservoir

National Forest Property

Golf Courses

Agriculture

Stables

Crop Production/Orchards

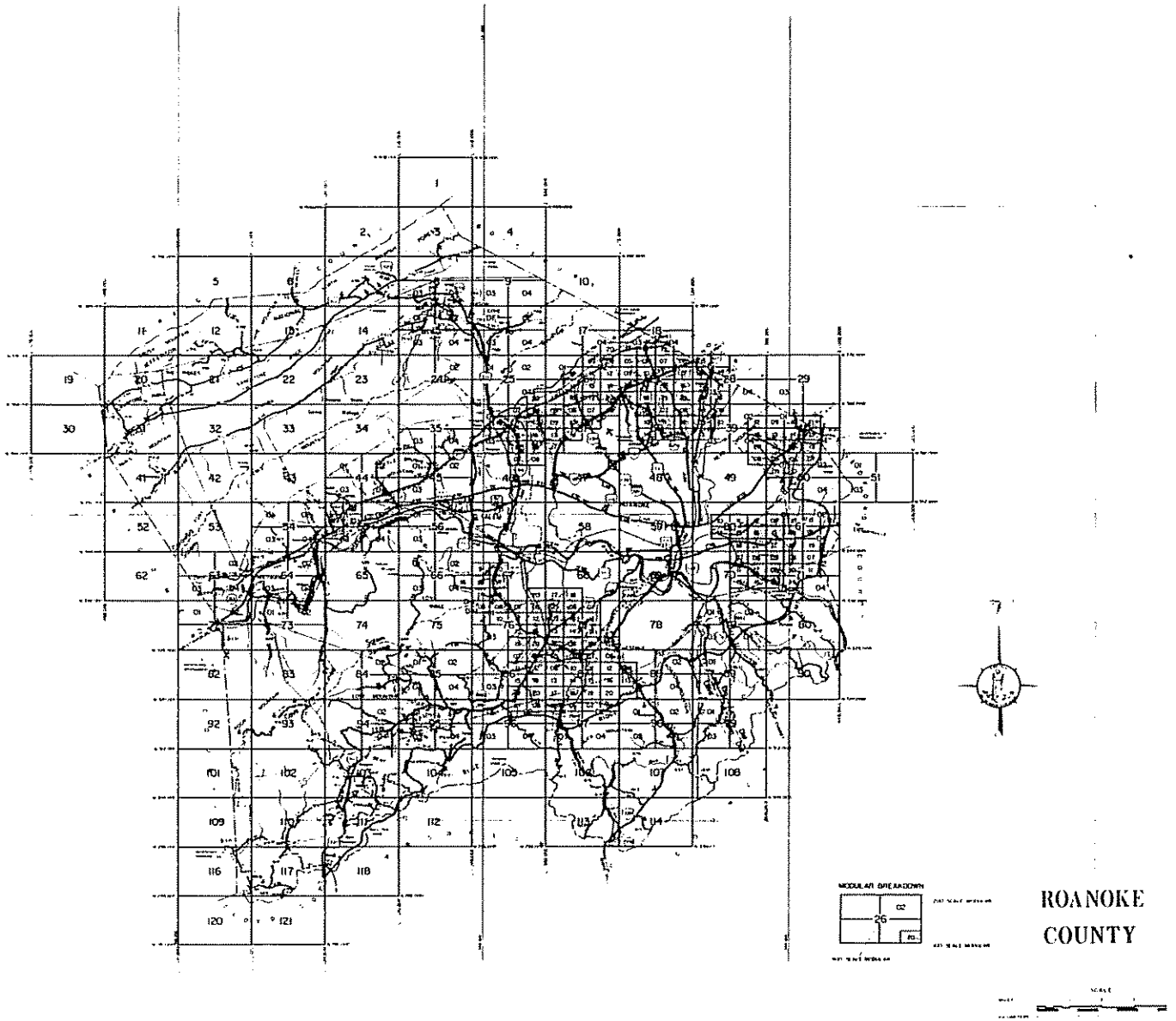
Appendix C
Concentrated Areas of Deteriorated or Dilapidated Housing
Roanoke County - 1983

Orthophoto Aerial Base Map Number[1]	Total Housing Units	Deteriorated or Dilapidated Units	Concentration Percentage
15.02	95	29	31
16.01	65	31	48
16.03	65	25	41
20.00	14	7	50
27.08	22	14	64 *
35.03	95	20	21
37.06	27	15	56 *
45.01	84	21	25
45.03	23	7	44
54.02	162	33	20
55.13	21	12	57 *
63.02	15	5	33
64.04	60	26	43
65.00	69	16	23
66.01	44	13	30
70.15	30	9	30
71.03	9	6	67 *
73.00	18	7	39
73.01	19	9	47
73.02	21	5	24
74.00	72	28	39
77.20	13	11	85 *
80.00	160	50	31
82.00	17	5	29
83.00	9	5	56 *
84.04	18	7	39
87.08	49	31	63 *
87.19	33	13	39
97.03	43	22	51 *
97.05	15	11	73 *
98.02	61	20	33
106.00	34	15	44
107.00	148	42	28
110.00	28	8	29
111.00	63	14	22
113.00	21	10	48
114.00	57	16	28

*Indicates concentrated areas of predominantly blighted housing.

1. Number corresponds to County Tax Map numbering system (see following page.)

Source: Roanoke County, Department of Development


ROANOKE
COUNTY

Appendix E

Correlation Between Capacity and Accident Rate

Log Curve $R^2 = 0.6039$

$Y = 0.2876 + 28.3166\ LNX$

Power Curve $R2 = 0.5130$

$Y = 17.9776 \times 0.2772$

Accident Rate Accident/Mile	Percent of Capacity Utilized	
	Log Curve	Power Curve
0	.3	0.0
5	45.86	38.44
10	65.49	53.32
20	85.11	73.97
30	96.60	89.58
40	104.74	102.61
50	111.06	114.01
60	116.22	124.26
65	118.50	129.05

Appendix F - Recreational Demands

	Population					Days	Part	(Weeks)	% of	Daily	Cap/					
	1983	1988	1993	1998	2003	Capita	Per Capita	Per Season	of Day	Design Unit	1983	1988	1993	1998	2003	
Picnicking	76,280	85,405	94,512	100,006	105,400	4.0	.47	26	.54	8	372	416	461	468	514	acres
Softball/Baseball						9.9	.459	26	.37	120	41	46	50	53	56	fields
Tennis						13.9	.208	26	.39	48	69	77	85	90	95	courts
Soccer						20.0	.146	20	.19	88	24	26	29	31	33	fields
Football						28.0	.130	20	.19	132	19	22	24	26	27	fields
Golf						14.0	.067	26	.39	360	2	3	3	3	4	courses
Pool Swimming						26.8	.370	14	.40	1350	16	17	19	20	22	pools
Basketball						23.2	.304	26	.37	100	76	85	94	100	105	courts
Camping						6.8	.224	26	.46	3	685	767	849	898	947	sites
Swimming						7.8	.406	14	.43	300	24	27	30	32	34	beach/acres
Jogging						37.6	.293	26	.15	72	67	75	83	88	93	miles/acres
Fishing						6.6	.291	26	.45	2	1,267	1,410	1,580	1,662	1,753	acres
Hiking/Backpacing						7.1	.233	26	.40	30	64	72	80	84	89	miles
Power Boating						8.9	.151	26	.47	.75	2,470	2,766	3,061	3,239	3,417	acres

	Population					Days Per Capita	Part Per Capita	(Weeks) of Season	% of Design Day	Daily Cap/ Unit						
	1983	1988	1993	1998	2003						1983	1988	1993	1998	2003	
Motorcycle Off -road	76,280	85,405	94,512	100,006	105,400	6.3	.130	26	.38	32	28	31	35	37	39	miles
ORV/4 Wheel						6.3	.129	26	.38	96	9	10	11	12	13	miles
Hunting						16.8	.120	12	.49	.17	36,937	41,356	45,766	48,420	51,086	miles
Water Skiing						16.0	.083	26	.47	.75	2,441	2,733	3,025	3,201	3,376	acres
Snow Skiing						4.6	.051	12	.50	180	4	4	5	5	5	acres
Ice skating						2.1	.043	16	.42	300	.6	.6	.75	.79	.8	rinks
Horseback Riding						12.1	.042	26	.45	40	16	18	20	21	23	miles
Sailing						1.7	.026	26	.45	1	58	65	72	76	80	acres
Canoeing						4.2	.059	26	.44	48	6	7	8	8	9	miles
Bicycling						64.1	.294	26	.37	200	102	114	126	134	141	miles

Source: Roanoke County, Department of Development and Department of Public Facilities.