

PUBLIC LANDS, Federal and State

<u>Federal</u>	<u>Acres</u>	<u>State</u>	<u>Acres</u>
George Washington National Forest.....	75,841.00	Memorial to V.M.I. Cadets.....	0.01
Woodstock Post Office.....	0.50	Department of Highways - residue...	0.38
Strasburg Post Office.....	0.40	Woodstock Access area (Chapman's Landing).....	2.50

Source: Federal and State Agencies.

ECONOMIC DATA SUMMARY

SHENANDOAH COUNTY

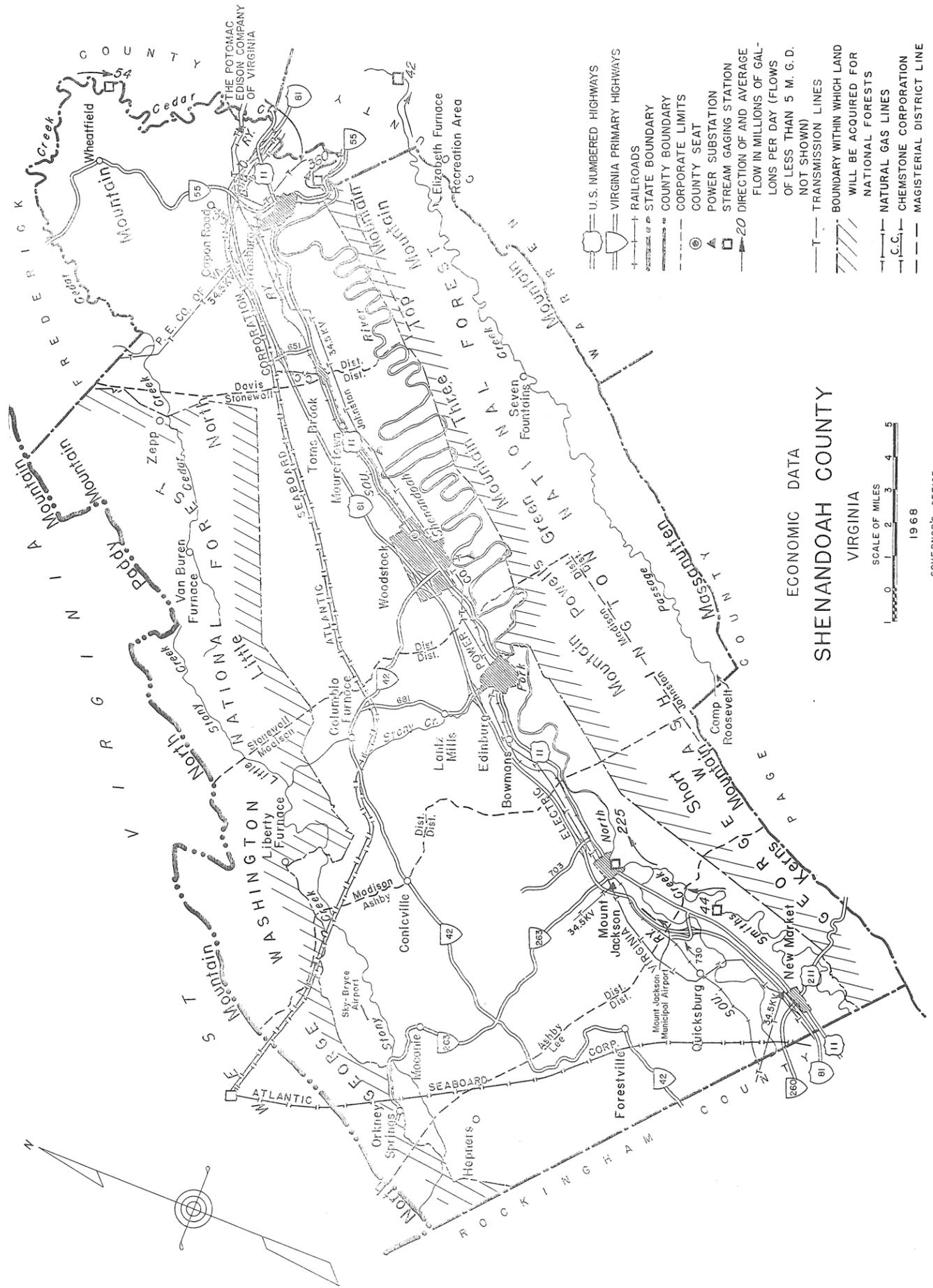
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AUGUST 1968
68-10

DIVISION OF STATE PLANNING & COMMUNITY AFFAIRS
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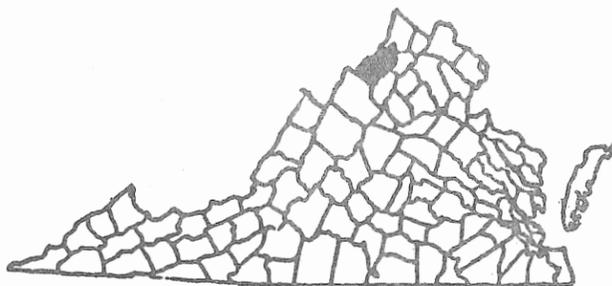
This report is one of a series made for all counties and independent cities in Virginia. The reports are revised every two years by the Research Section, Division of Planning. The cooperation of local citizens, chambers of commerce, and State, local, and federal government agencies is gratefully acknowledged.



ECONOMIC DATA
SHENANDOAH COUNTY
 VIRGINIA

SCALE OF MILES
 0 1 2 3 4 5

GENERAL DESCRIPTION AND HISTORY



INDEX TO COUNTY LOCATION

The Indian name Shenandoah is said to mean "Beautiful Daughter of the Stars." Shenandoah County, formed in 1772 as Dunmore County but re-named in 1778, was settled about 1730 by Scotch-Irish and Germans, many of whom moved down the valley from Pennsylvania. Woodstock, the county seat, was established in 1752. At New Market the Henkel Press, one of America's oldest publishing houses, has been in business since 1806. The county was the scene of much action in the War Between the States, and at New Market on May 15, 1864, the Virginia Military Institute cadets made their famous charge. A Confederate

hospital was at Mount Jackson. In 1960 Shenandoah had a population of 21,825 and Woodstock 2,083.

The county (land area 507 sq. mi. or 324,480 acres) is bounded by the Massanutten Mountains on the east and the North Mountains of the Alleghenies on the west, with the North Fork of the Shenandoah River winding a twisting course in the beautiful valley between. Elevations vary from about 1,200 feet in the valley to 3,500 feet in the western ridge. The average temperature is 36° in January, 76° in July. Annual precipitation averages 36 inches.

A little more than half the total county area is forested, chiefly on the mountains. The George Washington National Forest embraces large portions of both the Massanutten and the North Mountains. Minerals present are manganese, limestone, sandstone, iron, lead, zinc, shale and clay. Several dolomite limestone quarries are producing crushed limestone and various types of chemical lime. Iron smelting furnaces, long inactive, operated on local ores for over a hundred years. There are many mineral springs, and near Strasburg and New Market are several caverns famous for their limestone formation.

The limestone soils of the well cleared valley are excellent for agriculture, and the great volume of grains which was produced here caused this region to be called the "Granary of the Confederacy." Today, however, Shenandoah County is more famous for its poultry -- especially turkeys -- and it ranks 2nd highest among Virginia's counties in the number of turkeys raised. Livestock raising has increased greatly and dairy herds have been enlarged to supply the demands of the Washington markets. Fruits continue to contribute much to the farm income. Among the counties of Virginia, Shenandoah ranks near the top in production of turkeys, chicken broilers, eggs, cattle, calves, hogs, apples, and peaches.

Although Shenandoah is an agricultural county more people are employed in manufacturing than in farming. Many find work in construction, in services of every type, and in shops and stores of the excellent marketing areas of the several towns. Much of the local manufacturing is geared to the farm economy. Locally grown fowl are processed in a large poultry dressing plant in the county. Other agriculturally related products include vinegar and other apple products, flour and meal, poultry and livestock feeds, dairy products, agricultural lime, and equipment for fruit and poultry grading and processing. Many are employed in the manufacture of apparel such as infants' wear, blouses, knitted wear, trousers, and lingerie. Other manufactures include rayon fabrics, concrete products, and printing and publishing.

Within the county are two private schools, Massanutten Military Academy at Woodstock and Shenandoah Valley Academy at New Market, and several popular summer camps are operated in the remote regions. Located in Woodstock is the well-equipped Shenandoah County Memorial Hospital and the Susan B. Miller Nursing Home for the care of the aged and of chronic cases. At Strasburg, there is a public library. Newspapers are published in three of the towns. Shrine Mont at Orkley Springs is the summer conference grounds of the Episcopal Diocese of Virginia.

SHENANDOAH COUNTY

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SECTION I - POPULATION

Table 1.--Selected Population Statistics

	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1967</u>
Shenandoah County.....	20,898	21,169	21,825	23,413
Town of Edinburg.....	565	533	517	n.a.
Town of Mount Jackson.....	562	732	722	n.a.
Town of New Market.....	629	701	783	n.a.
Town of Strasburg.....	1,968	2,022	2,428	n.a.
Town of Toms Brook.....	219	256	244	n.a.
Town of Woodstock.....	1,546	1,816	2,083	n.a.
		<u>Shenandoah County</u>	<u>Virginia</u>	
		<u>1950</u>	<u>1960</u>	<u>1950</u> <u>1960</u>
Median age.....		29.7	31.9	27.3 27.1
Per cent of total population:				
Under 18.....		33.8	34.0	33.6 36.9
18 to 65.....		56.2	54.1	59.9 55.8
65 and over.....		10.0	11.8	6.5 7.3
Nonwhite.....		1.8	1.6	22.2 20.8
Rural-farm.....		n.a.	24.9	n.a. 10.0
Per cent of total population 14 years and over in total labor force.....		49.6	54.7	54.3 55.7
Median school years completed by persons 25 years and over.....		7.7	8.2	8.5 9.9

n.a. - not available.

Sources: U. S., Bureau of the Census, Census of Population, (1950 and 1960 editions); University of Virginia, Bureau of Population and Economic Research, "Estimates of the Population of Virginia Counties and Cities: July 1, 1967", (October 1967).

SECTION II - INCOME

Table 2 - Income Measures

	<u>Shenandoah County</u>	<u>Virginia</u>
Total personal income, 1965.....	\$44,901,000	\$10,691,000,000
Per capita income, 1965.....	1,922	2,413
Families:		
Median income, 1959.....	\$ 3,812	\$ 4,964
Per cent with incomes:		
Less than \$3,000.....	36.9	27.9
\$10,000 and over.....	6.2	13.2

Sources: 1959 figures - U. S. Bureau of the Census, Census of Population: 1960. 1965 figures - University of Virginia, Bureau of Population and Economic Research, "Personal Income of Virginia Counties and Cities, 1965 - A Preliminary Report and Provisional Estimates", (August 1967).

SECTION III - LABOR RESOURCES

WORK FORCE

Table 3.--Work Force Data^{a/} for Shenandoah County

	March 1960	March 1966	Per Cent Change 1960-66
Population.....	21,825	23,420	+ 7.3
Civilian work force.....	7,773	8,647	+ 11.2
Per cent of population.....	35.6	36.9	...
Unemployment.....	522	212	- 59.4
Per cent of work force.....	6.7	2.5	...
Employment.....	7,251	8,435	+ 16.3
Nonagricultural employment.....	5,731	7,436	+ 29.8
Manufacturing.....	1,848	2,323	+ 25.7
Durable goods.....	356	282	- 20.8
Lumber.....	b/	50	...
Furniture.....	0	b/	...
Stone, clay & glass products.....	166	131	- 21.1
Fabricated metal products.....	b/	0	...
Machinery, except electrical.....	b/	b/	...
Transportation equipment.....	b/	b/	...
All other durable goods ^{c/}	190	101	- 46.8
Nondurable goods.....	1,492	2,041	+ 36.8
Food.....	337	546	+ 62.0
Textile.....	b/	291	...
Apparel.....	979	1,123	+ 14.7
Printing.....	62	81	+ 30.6
Chemicals.....	0	0	...
All other nondurable goods ^{d/}	114	0	...
Nonmanufacturing.....	2,682	3,757	+ 40.1
Mining.....	b/	b/	...
Contract construction.....	183	555	+203.3
Trans. & pub. utilities.....	414	444	+ 7.2
Wholesale & retail trade.....	829	1,193	+ 43.9
Finance, insur. & real estate.....	118	150	+ 27.1
Service.....	531	615	+ 15.8
Government.....	570	728	+ 27.7
All other nonmanufacturing ^{e/}	37	72	+ 94.6
All other nonagricultural ^{f/}	1,201	1,356	+ 12.9
Agricultural.....	1,520	999	- 34.3

^{a/} Employment data are based on place of work rather than place of residence.
^{b/} Figures withheld to avoid disclosure of individual operations.
^{c/} Includes employment in durable goods manufacturing industries noted by note ^{b/}.
^{d/} Includes employment in nondurable goods manufacturing industries noted by note ^{b/}.

^{e/} Includes employment in nonmanufacturing industries.
^{f/} Includes nonagricultural, self-employed, unpaid family workers, and domestic workers in private households.

Source: Virginia Employment Commission, Division of Research, Statistics, and Information.

WAGES

Table 4.--Average Number of Establishments, Average Employment, Total Wages, and Average Wage Per Employee for the 12 Month Period Ending June 30, 1967^{a/}

Area	Av. Number of Establishments	Average Employment	Total Wages	Average Wage Per Employee
Shenandoah County total ^{b/}	202	4,450	\$ 17,599,699	\$3,955
Construction	28	247	1,009,418	4,087
Manufacturing	37	2,446	9,778,204	3,998
Trade	81	1,014	3,573,984	3,525
Services	25	266	724,352	2,723
State total ^{b/}	35,248 ^{c/}	906,463	\$4,616,595,363	\$5,093
Construction	5,349	83,722	480,722,653	5,742
Manufacturing	3,636	341,655	1,844,824,184	5,400
Trade	14,743	249,224	1,088,030,812	4,366
Services	5,962	96,234	410,714,373	4,268

^{a/} Coverage includes nonagricultural employers having four or more workers for 20 weeks within a calendar year. It excludes government, railroad, self-employed, domestic service, unpaid family workers, and some nonprofit organizations.

^{b/} Total includes other employment sectors in addition to those shown below.

^{c/} The number of establishments exceeds the State-wide total of liable employers because many concerns operate establishments in more than one area. The figure, "number of establishments," includes only one for each county or city, even though the employer may have several sites of operation in that county or city (e.g. chain stores).

Source: Virginia Employment Commission, Covered Employment and Wages (selected quarters).

POTENTIAL LABOR SUPPLYTable 5.--Estimated Potential Labor Supply as of February 1968^{a/}
in the Town of Woodstock and Within a 20 Mile Radius*

*Area includes: Shenandoah County, 100%; Page County, 68%; Warren County, 100%; Frederick County, 30%; and Hardy County, West Virginia, 24%.

Source of Supply	Total	Males		Females	
		White	Nonwhite	White	Nonwhite
Women not in the labor force	360	0	0	350	10
Males from agriculture	250	240	10	0	0
Unemployed	320	130	0	180	10
Annual new entrants	560	350	30	160	20
Total	1,490	720	40	690	40

Note: Definitions of Source of Supply:

Women not in the labor force: The number of women ages 25-44 inclusive who are not currently in the labor force but could be drawn into it provided the right job opportunities existed. Women 18-21 years of age are included in annual new entrants. Those 22-24 years old are not generally considered as potential, due to family obligations

Males from agriculture: The number of men (farmers and farm hands) in agriculture, ages 26 to 44 inclusive who could be expected to take industrial jobs if such became available. Many of these would be marginal farmers.

Unemployed: All persons 16 years of age or older who are currently available for work and are actively seeking a job, providing they are not persons "with a job but not at work" (e.g. on strike, ill, on vacation, etc.). Also included are persons waiting to start a new job within 30 days or awaiting recall from layoff.

Annual new entrants: The total number of young men ages 18-25 inclusive and young women 18-21 inclusive who will enter the labor force during the next twelve months and seek employment.

a/ Adequate consideration has been given to the depletion of the labor supply due to expansion and new firms in each area. Also, terrain and highways have been included in the analysis. However, this potential labor supply estimate does not take into consideration seasonal employment increases in the area that would, during that season, utilize part of the estimated supply. These data should be reviewed by the Virginia Employment Commission before using after August 1968.

Source: Research, Statistics and Information Division, Virginia Employment Commission, P. O. Box 1358, Richmond, Virginia 23211.

WORK-RESIDENCE INFORMATION

Table 6.--Work-Residence Information for Shenandoah County, April 1960

<u>Place of Work for Shenandoah County Residents</u>		
Item	Number	% of Total
Total resident workers reporting a place of work ^{a/}	7,765	100.0
Places of work reported:		
Shenandoah County.....	6,153	79.2
Out-commuters.....	(1,612)	(20.8)
Warren County.....	531	6.8
Rockingham County.....	288	3.7
Frederick County.....	178	2.3
Winchester City.....	133	1.7
Harrisonburg City.....	52	0.7
Page County.....	24	0.3
Clarke County.....	20	0.3
Fauquier County.....	9	0.1
Hardy County, West Virginia.....	4	0.1
Elsewhere.....	373	4.8

In-Commuters to Shenandoah County

Residence	Number
Rockingham County.....	165
Warren County.....	87
Frederick County.....	53
Page County.....	26
Harrisonburg City.....	25
Winchester City.....	8
Hardy County, West Virginia.....	4

Total..... 368

Total out-commuters = 1,612
Total in-commuters = 368
Net out-commuters = 1,244

Note: Details may not add up to totals due to rounding.

^{a/} Resident workers not reporting a place of work totaled 227.

Source: U. S., Bureau of the Census, Census of Population: 1960 (unpublished tabulations based on a 25 per cent sample.)

RETAIL TRADE

Table 9.--Measures of Retail Trade in Shenandoah County

<u>Item</u>	<u>1958</u>	<u>1963</u>	<u>Per Cent Change</u>
Shenandoah County			
Number of establishments	339	379	11.8
Total sales (000)	\$21,014	\$23,511	11.9
Total payroll (000)	\$ 1,757	\$ 1,995	13.5

<u>Item</u>	<u>1963</u> <u>Amount (000)</u>
Food.....	\$ 5,979
General merchandise.....	1,618
Apparel.....	263
Furniture, Furnishings and equipment.....	477
Automotive.....	4,250
Gasoline stations.....	2,630
Lumber, building materials and hardware..	1,571
Drugs.....	567
All other.....	6,156
Total.....	\$23,511

Source: U. S., Bureau of the Census, Census of Business: 1963. Retail Trade (Washington: Government Printing Office, 1965).

Table 10.--Virginia Sales Tax, Sales Taxable for October, 1966 - September, 1967

<u>Item</u>	<u>Shenandoah County</u>
Average number of registered dealers	735
Taxable sales	\$20,820,604

Source: Virginia Department of Taxation, Taxable Sales, Quarterly Report (selected quarters).

WHOLESALE TRADE

Table 11.--Measures of Wholesale Trade in Shenandoah County

<u>Item</u>	<u>1958</u>	<u>1963</u>	<u>Per Cent Change</u>
Shenandoah County			
Number of establishments	21	21	0.0
Total sales (000)	\$8,513	\$9,424	10.7
Total payroll (000)	\$ 336	\$ 436	29.8

Source: U. S., Bureau of the Census, Census of Business: 1963. Wholesale Trade, Virginia, BC 63 - WA 48 (Washington: Government Printing Office, 1965).

SELECTED SERVICES

Table 12.--Measures of Selected Services in Shenandoah County

<u>Item</u>	<u>1958</u>	<u>1963</u>	<u>Per Cent Change</u>
Shenandoah County			
Number of establishments	140	182	30.0
Total receipts (000)	\$2,122	\$2,751	29.6
Total payroll (000)	\$ 383	\$ 583	52.2

Source: U. S., Bureau of the Census, Census of Business: 1963. Selected Services, Virginia, BC 63 - SA 48 (Washington: Government Printing Office, 1965).

AGRICULTURE

Table 13.--Selected Measures of Agriculture in Shenandoah County

<u>Item</u>	<u>1959</u>	<u>1964</u>
Number of farms	1,618	1,131
Per cent of land area in farms	57.3	49.2
Average size of farms	115.0 acres	141.1 acres
Value of all farm products sold	\$9,008,150	\$9,738,298
Land in farms	185,996 acres	159,593 acres
Cropland	63,428 acres	60,157 acres
Woodland ^a /on farms	55,061 acres	40,519 acres
Pasture ^a	61,572 acres	53,927 acres
Other land in farms	5,935 acres	4,990 acres
<u>Value of farm products sold, 1964</u>	<u>Number of Farms</u>	<u>Per Cent of Total</u>
Under \$500	293	25.9
\$ 500 to \$ 999	147	13.0
\$ 1,000 to \$ 1,999	177	15.6
\$ 2,000 to \$ 4,999	250	22.1
\$ 5,000 to \$ 7,499	66	5.8
\$ 7,500 to \$ 9,999	48	4.2
\$10,000 to \$14,999	50	4.4
\$15,000 and over	100	8.8
Total	1,131	100.0

Principal sources of farm income in 1964 were:

- \$4,712,528 from poultry and poultry products - 2nd highest in the State. (chiefly turkeys - 2nd highest, broilers - 4th, and eggs - 7th).
- \$2,411,975 from livestock - 7th highest (chiefly cattle - 7th highest, calves - 8th, hogs - 10th, and sheep - 10th).
- \$1,369,611 from dairy products (chiefly whole milk)
- \$ 836,770 from fruits - 4th highest (chiefly apples - 4th highest and peaches - 11th highest).

Note: Details may not add to totals due to rounding.

^a/ Excludes woodland pasture.

Source: U. S., Bureau of the Census, Census of Agriculture: 1964. Virginia, Vol. 1, Part 24 (Washington: Government Printing Office, 1967).

SECTION V - GOVERNMENTTYPE

Shenandoah County is governed by a board of supervisors composed of one supervisor elected from each of the six magisterial districts into which the county is divided. These supervisors are elected for a term of four years. They have no magisterial district functions, but collectively (as the board) they have charge of general county administration with control over taxation, budgets, borrowings and accounting. They meet once a month, or more often if necessary, at the courthouse in Woodstock. Meetings are open to the public. Other county officials are chosen by the electorate of the entire county including the incorporated towns which are politically a part of the county and the district, or districts, in which they are located.

Since Edinburg, Mount Jackson, New Market, Strasburg, Toms Brook and Woodstock are incorporated towns they are part of the county; the ordinances and regulations of the county are effective in them. Each of the towns has its own town government under the direction of a mayor and town council elected by the voters of the town only. Strasburg and Woodstock have adopted the town manager form of government in which the town council appoints a manager who acts as the administrative head of the town government. Council retains the legislative powers. Since residents of the towns are affected by two governments -- both town and county -- the qualified electorate vote for officials of the two governing bodies. However, county residents do not vote for, or come under the government of the towns.

PLANNING ACTIVITIES

The Town of Woodstock has a planning commission and has enacted zoning ordinances and subdivision regulations. A comprehensive plan has been in use for several years. Shenandoah County has an eight member planning commission and has enacted subdivision regulations. The Towns of New Market and Strasburg have planning commissions, and Strasburg has subdivision regulations.

PUBLIC SAFETY

Police protection - The county sheriff with several deputies and the police force of each of the towns of the county provide police protection to the area. Six troopers of the Virginia State Police are assigned to Shenandoah County and give assistance to the local police agencies in the investigation of all criminal activities. The Sheriff's Department has teletype and two-way radio equipment, and all officers in the towns and county have patrol cars which are radio equipped.

Fire protection - Shenandoah County residents are afforded excellent fire protection by seven volunteer companies located in the Towns of Edinburg, Mount Jackson, New Market, Strasburg, Toms Brook, and Woodstock, in the community of Orkney Springs and in Powell's Fort Valley. All of these companies have one or more pumper trucks, two have water trucks, and two have trucks for carrying personnel. Mount Jackson has a portable electric generator for lights. With the exception of Orkney Springs and Powell's Fort Valley, each of the pumper trucks is equipped with two-way radios. Members have received training in fire-fighting, first aid and rescue work, and the Woodstock Company has an ambulance.

PUBLIC SAFETY (Continued)

Rescue squads - Rescue squads have been organized at Woodstock, Mount Jackson, and Strasburg, and private ambulances are available in all six of the incorporated towns.

SECTION VI - LOCAL TAXES

REAL ESTATE

Table 14.--Real Estate Assessment Ratios and Average Effective True Tax Rates, 1966

	Nominal Tax Rate Per \$100	Average Assessment Ratio ^{a/}	Average Effective True Tax Rate Per \$100
Shenandoah County	\$2.20	19.0%	\$.42
Edinburg ^{b/}	1.10	19.0	.21
Mount Jackson ^{b/}	1.50	19.0	.29
New Market ^{b/}	1.50	19.0	.29
Strasburg ^{b/}	1.20	19.0	.23
Toms Brook ^{b/}	.50	19.0	.10
Woodstock ^{b/}	1.00	19.0	.19

^{a/} Average ratio of assessed valuation to selling price as compiled in a 1966 study by the Virginia Department of Taxation.

^{b/} Levies shown are for town purposes only and are in addition to the basic county levy.

Source: "Real Estate Taxes in Virginia", Memo released by C. H. Morrissett, State Tax Commissioner, Department of Taxation, Richmond, Virginia, (June 1, 1967).

MACHINERY AND TOOLS

	Average Nominal Tax Rate Per \$100
Shenandoah County	\$1.55
Edinburg	^{a/}
Mount Jackson	^{a/}
New Market ^{b/}	^{a/}
Strasburg ^{b/}	1.20
Toms Brook ^{b/}	^{a/}
Woodstock ^{b/}	1.00

^{a/} Edinburg, Mount Jackson, New Market, and Toms Brook do not levy a tax on machinery and tools. Manufacturers in these towns would be subject to the county levy only.

^{b/} Levies shown are for town purposes only and are in addition to the basic county levy.

MACHINERY AND TOOLS (Continued)

Note: The true tax rates are considerably below the nominal rates shown as the county and towns base their assessment of machinery and tools on a percentage of the original cost value. The percentages used to determine the assessed value are as follows:

1 year old	75%
2 years old	50%
3 years old	40%
4 years old	30%
5 years old	20%
6 years or older	10%

Source: Local Taxes on Manufacturers in Virginia (Richmond: Division of Industrial Development, September, 1967), and the local Commission of Revenue.

TANGIBLE PERSONAL PROPERTY^{a/}

	Average Nominal Tax Rate Per \$100
Shenandoah County	\$2.60
Edinburg ^{b/}	1.10
Mount Jackson ^{b/}	1.50
New Market ^{b/}	2.00
Strasburg ^{b/}	1.20
Toms Brook ^{b/}	.50
Woodstock ^{b/}	2.00

^{a/} Individual's property consisting of motor vehicles, boats, trailers, tools, and farm machinery and livestock. (Tangible personal property of manufacturers, such as office furniture and fixtures and trucks and company cars, is not taxed at the local level. It is taxed by the State at 30¢ per \$100 of the book value.)

^{b/} Levies shown are for town purposes only and are in addition to the basic county levy.

Note: The method and percentage used to determine the assessed value depend upon the type of tangible personal property. However, the true tax rates are considerably below the nominal rates shown.

Source: Local Tax Rates, Tax Year 1967, Bulletin No. 119 (Richmond: Department of Taxation, no date.)

MERCHANTS' CAPITAL

Shenandoah County has a merchants' capital tax of 60¢ per \$100 of assessed valuation. In addition to the basic county levy, Mount Jackson imposes a tax of 20¢ per \$100 of assessed valuation. The other towns do not impose this tax, but merchants located in them pay the county levy. Merchants' capital is defined as inventory of stock on hand, the excess of bills and accounts receivable over bills and accounts payable, and all other taxable personal property, except money on hand and on deposit, and tangible personal property not offered for sale as merchandise. (This tax applies mainly to retailers and wholesalers. A manufacturer is taxed on these items at the State rate of 30¢ per \$100 of book value.)

MERCHANTS' CAPITAL (Continued)

All of the towns in Shenandoah County impose license taxes. Information on license taxes for different types of businesses may be obtained from town authorities.

Source: Local Tax Rates, Tax Year 1967, Bulletin No. 119 (Richmond: Department of Taxation, no date.)

SALES TAX

Shenandoah County imposes a local tax of 1% in addition to the State-wide sales tax of 2% which will be increased to 3% beginning July 1, 1968. Exemptions allowed are identical at both the state and local levels and include purchases of materials for future processing; packaging materials; machinery and tools or repair parts; and fuel and power used or consumed in the manufacturing process.

SECTION VII - TRANSPORTATIONHIGHWAY

U. S. Route 11, an arterial road running the entire length of the Shenandoah Valley and connecting Virginia with points north and south, runs through the county's central valley passing through each of the incorporated towns. Interstate Highway 81 with 7 interchanges in the county roughly parallels this highway. Planned Interstate 66 from Washington, D. C. will intersect 81 just north of Strasburg. State Route 55 passes east-west through this town, and U. S. 211 from Washington, D. C. cuts across the southern tip of the county connecting with U. S. 11 at New Market. Other State primary and secondary roads connect all parts of the county with these principal routes.

Trucking - Fast interstate motor freight to all parts of the nation is provided by 13 trucking companies authorized to operate in the area. Most of the national trucking companies have routes through the county, and six have offices and facilities either in Shenandoah or adjacent counties. Two of these motor lines also operates regular intrastate service. Several locally owned truck companies also operate in the county.

Bus - Passenger bus service is supplied by Greyhound Bus Lines on the run between Washington, D. C., and Roanoke, Virginia, and Knoxville, Tennessee. Five daily schedules are provided in each direction. Two locally owned charter bus companies operate on an interstate basis.

RAILROADS

A branch of the Southern Railway from Harrisonburg in adjacent Rockingham County to Washington, D. C. closely parallels U. S. Route 11 through the county. This line passes through or near each of Shenandoah County's towns and has a junction with the Baltimore and Ohio Railroad near Strasburg. Daily freight service is available from all points on these lines.

AIRPORTS

The nearest airport offering commercial airline service is Shenandoah Valley Airport (near Weyers Cave in Augusta County) where Piedmont Airlines offers several flights daily to Washington, D. C., Lynchburg, and Roanoke and connections to all parts of the nation and the world. This field has one 5,000 foot hard surfaced runway which is lighted at night. It is attended during the daylight hours and offers fuel, repairs, charter service, rent-a-car, and surface transportation. Food and lodging are also available. Residents of the county are within an hour and a half's drive of the new Dulles International Airport in eastern Loudoun County which is served by several national and international airlines. This major airfield provides modern facilities and multiple services and brings jet-age travel within easy reach of Shenandoah County.

There are two small airfield in Shenandoah County. At Mount Jackson is the Mount Jackson Airport with a sod runway 2,700 feet in length, and at Bayse in the western corner of the county is Bryce's Airport which has a hard surfaced runway of 2,400 feet. This field provides beacon, and runway lighting, and unicom. Surface transportation is available.

Small airports in adjacent counties are Aspen Hill Farms Airport with a 1,800 foot sod runway and Stokes Field with a 3,100 foot runway located near Front Royal, Warren County, and Winchester Municipal Airport, in Frederick County to the north, with a 3,600 foot hard surfaced runway which is lighted upon request. Stokes Field and Winchester Airport are attended during the day, and offer fuel, repairs, charter service, telephone and surface transportation. Food and lodging are available nearby at all of the airports.

SECTION VIII - UTILITIESWATERWORKS SYSTEMS

The town of Edinburg owns its water system supplied by three mountain streams and a well as an auxiliary source. The water is chlorinated and the safe dry weather yield from all sources is 300,000 gallons per day. The total finished water storage in the distribution system is 500,000 gallons. Average daily use is 90,000 gallons and average water hardness is about 1.5 grains per gallon for the mountain sources, and 12 grains per gallon for the well.

The municipally owned system at Mount Jackson obtains water from a mountain stream and two wells. The safe dry weather yield of the wells is about 84 gallons per minute and that of the mountain supply 75,000 gallons per day. The well pumps direct to the distribution system which has a total finished water storage of 2 million gallons. Average finished water hardness of the mountain supply is 1.5 grains per gallon and of the well 5.5 grains per gallon. About 120,000 gallons are used per day.

At New Market the system, also municipally owned, gets its water from three sources. One is a small mountain stream having a drainage area of one-half square mile. This water is chlorinated. Smiths Creek is another source and its water is treated with a coagulate, filtered and chlorinated in a plant having a designed capacity of 320 gallons per minute. The third source is a well with a safe yield

WATERWORKS SYSTEMS (Continued)

in excess of 250 gallons per minute. This well water is chlorinated. The total finished water storage in the distribution system is 6.5 million gallons. Hardness of the mountain supply is about 1.5 grains per gallon, of Smith Creek and the filter plant 4.5 grains per gallon, and of the well approximately 6.5 grains per gallon. Average use is 400,000 gallons per day.

The Town of Strasburg owns its water system, the main source of which is a mountain stream with an impounding reservoir and a series of nine springs. A total raw water storage of 43.5 million gallons is available. The water flows by gravity to the distribution system and is chlorinated. A supplementary supply obtained from North Fork Shenandoah River is filtered and chlorinated in a plant having a capacity of 440 gallons per minute. The total finished water storage in the distribution system is 228,000 gallons. The average finished water hardness is 2 grains per gallon and average daily use is 350,000 gallons.

The municipally owned system at Woodstock is supplied by a mountain stream known as Little Stony Creek. There is a drainage area of approximately 12 square miles above the impounding reservoir which has a capacity of 36 million gallons. The water flows by gravity to the distribution system and is chlorinated and treated for corrosion control. Average daily use is 425,000 gallons and hardness is about 1.5 grains per gallon. A 400,000 gallon concrete reservoir furnishes water storage.

In addition to the above, there are in the county seven small supplies either in use or under development that serve, or will serve industries. Wells supply these systems which furnish water for domestic purposes as well as industrial uses. Average finished hardness of well water in this area is about 6 grains per gallon. Storage on these systems varies, depending on the demands, but in all cases is adequate.

SEWERAGE SYSTEMS

At Edinburg the plant is owned by the town and provides primary treatment with chlorination. It is designed to handle a flow of 100,000 gallons per day. The average daily flow is 85,000 gallons.

Mount Jackson's municipally owned plant is designed to handle a flow of 150,000 gallons and provide primary treatment with chlorination. The average daily flow is 110,000 gallons.

The town-owned treatment plant at Strasburg provides primary and secondary treatment with chlorination and is designed to handle a flow of 300,000 gallons. Daily flow averages 400,000 gallons.

New Market's town-owned plant provides primary and secondary treatment with chlorination and is designed to handle a flow of 300,000 gallons per day. The average daily flow is 350,000 gallons.

The municipally owned plant for Woodstock provides primary and secondary treatment with chlorination. The plant is designed to handle a flow of 300,000 gallons. Daily flow averages 600,000 gallons.

Source: Virginia Department of Health

WATER AND SEWERAGE RATESEdinburg - Water Rates (Quarterly):

<u>Inside town</u>	
First 10,000 gallons	\$6.00, minimum charge
Next 15,000 gallons	.48 per 1,000
Next 25,000 gallons	.30 per 1,000
Next 50,000 gallons	.24 per 1,000
Next 100,000 gallons	.18 per 1,000
All additional	.12 per 1,000

Outside town

50% higher than town rates.

Sewerage rates: 100% of water bill.

Mount Jackson - Water Rates (Monthly):

<u>Inside town</u>	
First 2,000 gallons	\$2.00, minimum charge
Next 5,000 gallons	.60 per 1,000
Next 10,000 gallons	.50 per 1,000
All additional	.40 per 1,000

Outside town

33 1/3% higher than town rates.

Sewerage rates (Monthly):

Inside town
75% of water bill

Outside town
33 1/3% higher than town rates.

New Market - Water Rates (Quarterly)

<u>Inside town</u>	
First 5,000 gallons	\$6.00, minimum charge
Next 10,000 gallons	.60 per 1,000
Next 20,000 gallons	.55 per 1,000
Next 40,000 gallons	.45 per 1,000
Next 75,000 gallons	.40 per 1,000
Next 150,000 gallons	.30 per 1,000
All additional	.25 per 1,000

WATER AND SEWERAGE RATES (Continued)

Outside town

First	5,000 gallons	\$9.00, minimum charge
Next	10,000 gallons	.90 per 1,000
Next	20,000 gallons	.825 per 1,000
Next	40,000 gallons	.675 per 1,000
Next	75,000 gallons	.60 per 1,000
Next	150,000 gallons	.45 per 1,000
All additional		.25 per 1,000

Sewerage Rates (Quarterly):

Inside and Outside of town

50% of the water bill.

Strasburg - Water Rates (Quarterly):

Inside town

Domestic rates:

First	12,000 gallons	\$7.50, minimum charge
Next	38,000 gallons	.32 per 1,000
All additional		.25 per 1,000

Commercial rates:

18,000 gallons	\$7.50
30,000 gallons	.35 per 1,000
50,000 gallons	.30 per 1,000
200,000 gallons	.25 per 1,000
500,000 gallons	.20 per 1,000
800,000 gallons	.15 per 1,000

Outside town

40% higher than town rates.

Sewerage rates (Quarterly):

Inside town

60% of water bill.

Outside town

40% extra charge.

WATER AND SEWERAGE RATES (Continued)

Woodstock - Water Rates:

Inside town

First	3,000 gallons	\$3.50, minimum charge
	3,000 to 10,000 gallons	5.50, minimum charge
Next	15,000 gallons	.45 per 1,000
Next	25,000 gallons	.35 per 1,000
Next	50,000 gallons	.30 per 1,000
Next	100,000 gallons	.20 per 1,000
All additional		.15 per 1,000

Outside town

100 % higher than town rates.

Sewerage rates:

Inside town

First	10,000 gallons	\$4.00, minimum charge
Next	20,000 gallons	.30 per 1,000
Next	20,000 gallons	.25 per 1,000
Next	50,000 gallons	.20 per 1,000
Next	100,000 gallons	.15 per 1,000
All additional		.10 per 1,000

Outside town

25% higher than town rates.

ELECTRICITY

Shenandoah County is supplied electricity by two privately owned companies and one REA Cooperative. The Virginia Electric and Power Company, the largest electric utility in Virginia, serves five of the six incorporated towns and almost half of the county area. Division and district offices of this company are in Charlottesville, and an area office is in Woodstock. The northern part of the county and the Town of Strasburg receive electric power from the Potomac Edison Power Company of Virginia, which has district offices in Winchester and a local office in Strasburg. The Shenandoah Valley Electric Cooperative services the remaining portion of the county. It receives power from VEPCO's transmission system, and its main office is in the Town of Dayton in Rockingham County.

Primary service is available at 60 cycles alternating current, three phase service, at various voltages depending upon individual customer requirements and specific locations. There is adequate and dependable power available for any need. Rates are comparable with those in effect elsewhere. Tariffs applicable to individual requirements may be obtained from the appropriate power supplier.

NATURAL GAS

Two 26-inch natural gas transmission pipelines of the Atlantic Seaboard Corporation pass through the center of the county and one 24-inch transmission line of this same corporation crosses the southwestern corner. There is a 2-inch pipeline supplying gas to Chemstone Corporation near Strasburg and gas is delivered in the Town of Strasburg. The county is within the franchise area of the Shenandoah Gas Company, and this company will provide natural gas distribution to industries within the county when economically feasible.

The Shenandoah Gas Company, a subsidiary of the Washington Gas Light Company, supplies gas with monthly rates as follows:

Table 15.--Rate Schedule, A General Service

First	10 therms	23¢ per therm
Next	10 therms	20¢ per therm
Next	30 therms	17¢ per therm
Next	450 therms	12¢ per therm
Next	500 therms	10¢ per therm
Next	1,000 therms	9¢ per therm
All additional		8¢ per therm

Minimum monthly charge:

October through April: \$1.50

May through September: No minimum charge; customer is billed only after gas consumed since last bill equals or exceeds \$1.50.

The purchased gas adjustment is -.0051¢ per therm effective January 1, 1968.

therms - 100,000 BTU's.

Table 16.--Rate Schedule B Small Volume Commercial and Industrial Service

Available to customer whose total daily requirements on an annual basis averages less than 2,500 therms. (Not available for boiler fuel if the amount exceeds 20,000 therms in any one day). This limitation does not apply to gas used to provide space heating or air conditioning).

PART I - Firm

Demand charge: 65.3¢ per therm of maximum daily firm quantity. The purchased gas adjustment is -.83¢ per therm.

Commodity charge: 5.82¢ per therm for all gas delivered up to the product of the maximum daily firm quantity times the days in the billing month.

Minimum monthly charge is the demand charge for the month.

The purchased gas adjustment is -.56¢ per therm effective January 1, 1968.

Table 16.--Rate Schedule B Small Volume Commercial and Industrial Service (Cont.)

PART II - Interruptible

First	5,000 therms	7.12¢ per therm
Next	5,000 therms	6.72¢ per therm
Next	5,000 therms	6.22¢ per therm
Next	20,000 therms	5.72¢ per therm
All additional		5.52¢ per therm

Minimum monthly charge: \$130.00

The purchased gas adjustment is .03¢ per therm as of January 1, 1968

Table 17.--Rate Schedule C Large Volume Commercial and Industrial Service

Available to customer whose total daily requirements on an annual basis averages 2,500 therms or more.

PART I - Firm

Demand charge: 50.3¢ per therm of maximum daily firm quantity per month.

The purchased gas adjustment is -.83¢ per therm.

Commodity charge: 4.37¢ per therm for all gas delivered up to the product of the maximum daily firm quantity times the days in the billing month.

The purchased gas adjustment is -.56¢ per therm.

Minimum monthly charge is the demand charge for the month.

PART II - Interruptible

First	50,000 therms	5.32¢ per therm
Next	50,000 therms	4.92¢ per therm
Next	50,000 therms	4.82¢ per therm
All additional		4.72¢ per therm

Minimum monthly charge is 30¢ per therm multiplied by the maximum daily interruptible quantity specified in the sales agreement.

The purchased gas adjustment is .03¢ per therm effective January 1, 1968.

Table 18.--Rate Schedule A-C Air Conditioning Service

Available to residences which have individually metered air conditioning units, and other buildings which have separate meters for equipment used principally for air-conditioning or all-year heating and cooling.

For all gas used during the billing months ending June through October:

First	10 therms	23¢ per therm
Next	10 therms	20.0¢ per therm
Next	10 therms	17.0¢ per therm
Next	120 therms	8.5¢ per therm
All additional		6.5¢ per therm

The minimum monthly bill is \$1.50.

The purchased gas adjustment is -.0033¢ per therm effective January 1, 1968.

For all gas used during other billing months - see Schedule A.

SECTION IX - EDUCATION

PUBLIC SCHOOLS

Table 19.--Selected Public School Information

Item	Shenandoah County	Virginia
Enrollment ^{a/}		
1959-60	4,821	841,574
1966-67	5,031	1,034,676
Per cent change	4.4	22.9
Gross average daily attendance ^{b/}		
1959-60	4,433	756,478
1966-67	4,959	929,823
Per cent change	11.9	22.9
Cost of operation per pupil in gross average daily attendance ^{c/}		
1959-60	\$217.79	\$256.07
1966-67	\$402.97	\$454.59
Per cent change	85.0	77.5
Average annual teacher salary ^{d/}		
1959-60	\$ 3,662	\$ 4,153
1966-67	\$ 5,387	\$ 6,145
Per cent change	47.1	48.0
Pupil-teacher ratio ^{e/}		
1959-60	28.2	27.9
1966-67	22.2	23.7
High school enrollment		
1959-60	1,548	243,900
1966-67	1,801	352,453
Per cent change	16.3	44.5
High school graduates		
1959-60	229	30,262
1966-67	264	50,104
Per cent change	15.3	65.6
High school dropouts, 1966-67 ^{f/}	75	18,577
Number of children in 1965 school census, age 7 through 19 years	5,130	1,041,147

^{a/} Total number of pupils admitted to the school system; State figure adjusted to exclude double counting for transfers from one school system to another.

^{b/} Average daily attendance (ADA) of all schools in the county, plus ADA of pupils for whom the area pays tuition, minus ADA of pupils for whom tuition is received.

^{c/} Debt service and capital outlay excluded.

^{d/} Classroom teaching positions (excludes supervisors, principals and head teachers).

^{e/} Average number of day school pupils per classroom teaching position.

^{f/} Enrolled pupils who drop out during the school term; summer dropouts are not included.

Sources: Superintendent of Public Instruction, Annual Report, (1959-60 and 1966-67 editions), (Richmond: State Board of Education); Division of Educational Research and Statistics, Virginia High School Dropouts, 1966-67, Grades 8-12, (Richmond: State Department of Education, September, 1967).

PUBLIC SCHOOLS (Continued)INDUSTRIAL TRAINING

Two high schools in the county offer classes in the Industrial Cooperative Training Program which is designed to train young people for the occupations available in their communities. Part-time classes in the school are coordinated with part-time work in local industrial establishments. The high schools at Mount Jackson and Strasburg offer courses in drafting. Triplett Business and Vocational School at Mount Jackson offers many technical and vocational courses.

PRIVATE SCHOOLS

There are two accredited privately operated secondary schools in the county, Shenandoah Valley Academy (coeducational) near New Market and Massanutten Military Academy in Woodstock.

HIGHER EDUCATION

There are three four-year accredited colleges in adjoining Rockingham County. Madison College for women (enrollment about 2,999) and the coeducational Eastern Mennonite College, with over 800 students, are both at Harrisonburg. At Bridgewater is Bridgewater College, coeducational, with nearly 900 enrolled. All of these institutions offer standard courses leading to the B. S. and B. A. degrees. In Winchester to the north in Frederick County is the Shenandoah Conservatory of Music, a four-year degree-granting institution for music only, and Shenandoah College offering two years of college work. Both are coeducational and together have over 500 students. The University of Virginia offers some extension courses in Woodstock.

Blue Ridge Community College is located at Weyer's Cave in northern Augusta County about 30 miles from New Market. Here technical courses and the first two years of college work are offered.

SECTION X - RECREATION

The natural assets of Shenandoah County make possible many types of recreation. George Washington National Forest extends over the mountainous sections along both the eastern and western boundaries of the county and offers scenic drives, hiking trails, picnic and camp areas, and hunting and fishing. Deer are very plentiful and each year nearly 2,000 are killed by hunters who flock to this county. Wild turkey and small game are also abundant. The sportsman also finds excellent fishing in the many streams which have been stocked by the Commission of Game and Inland Fisheries. Brook, rainbow and brown trout abound in the mountain streams and crappie, bream, pickerel and several species of bass are found in the North Fork Shenandoah River.

One of the State's most beautiful drives follows Passage Creek in Powell Fort Valley in the Massanutten Mountain range in the eastern part of the county. The National Forest Service maintains picnic grounds at Elizabeth Furnace, an old iron furnace on Passage Creek, and in Little Fort, the valley between Three Top Mountain and Green Mountain. A road from Woodstock into Fort Valley passes

RECREATION (Continued)

over Powells Mountain near a viewing tower from which one can see the seven horseshoe bends of the North Fork Shenandoah River as it winds its way through the valley 1,000 feet below, and beyond the valley the ridges of North Mountain which forms the western boundary of the county. Other beautiful drives lead into the Massanutten Mountains from near Mount Jackson and through Edinburg Pass. Thrilling views of the valley may be had from the road over Little North Mountain into Cedar Creek Valley.

Shenandoah County has many summer camps and all have swimming facilities and playfields. Near Columbia Furnace is Camp Strawderman, a large camp for girls, and in Little Fort Valley is a camp operated by religious and civic groups. Camps for boys are Camp Lupton near Woodstock, Camp Bear Wallow near Orkney Springs, Camp St. George at Shrine Mont near Orkney Springs, and Happy Gap Camp which is west of Woodstock.

Two of the famous limestone caverns of Virginia, visited by thousands each year, lie within the county -- Battlefield Crystal Caverns near Strasburg and Shenandoah Caverns north of New Market. Another popular cavern, Endless Caverns lies just over the Rockingham County line, three miles south of New Market.

Organized recreation is provided by the Town of Woodstock and during the summer months a staff of six directs activities at Woodstock Recreation Park where there are swimming and wading pools, tennis and basketball courts, a ball diamond, playground, and picnic shelters. In Strasburg the Lions Club operated a playground, picnic area, and facilities for tennis and softball. There is a swimming pool operated by a private corporation at Strasburg and another near New Market. Swimming, boating and fishing may also be enjoyed in the many ponds and lakes scattered throughout the county. High schools at Woodstock, Strasburg, and New Market have lighted athletic fields and unlighted fields are at schools in the other towns. Woodstock Recreation Park and the Lions Club Park at Strasburg also have lighted fields and Little League baseball is active in these towns and in Edinburg and New Market. In most of the communities recreation is sponsored by the schools, churches, and civic, fraternal and social organizations, and meetings and entertainments are held in the school auditorium.

Many privately operated resorts and parks are scattered throughout the county and these provide horseback riding, hiking, swimming, golf, and other sports. In winter skiing is popular at Bayse where a ski lift and several ski trails provide for the beginner as well as the more proficient skier. Instructors are provided. Bowling and billiard facilities are in Mount Jackson and Strasburg. At Shrine Mont is a collection of paintings open to the public, and near New Market there is a permanent exhibit of china, pottery, earthenware, and crystal. There is a museum of Indian relics and handcrafts between Edinburg and Mount Jackson. Snake, monkey and chinchilla farms near the Valley Pike are interesting. Annual summer events in the county are the Shenandoah Valley Music Festival and a horse show.

SECTION XI - OTHER COMMUNITY FACILITIESFINANCIAL

Banks are conveniently located in five communities of Shenandoah County. These banks are their total deposits as of June 30, 1967 are:

<u>Community</u>	<u>Bank</u>	<u>Total Deposits June 30, 1967</u>
Edinburg	Farmers Bank of Edinburg, Inc.	\$ 2,983,989
Mount Jackson	Peoples Bank	4,357,000
New Market	Citizens National Bank of New Market	3,962,418
Strasburg	First National Bank of Strasburg Massanutten Bank of Shenandoah Valley, National Association (home office)	6,615,219
Woodstock	National Bank of Woodstock 2 Branches of the Massanutten Bank of Shenandoah Valley, National Association	13,643,712 4,951,312 Included under Strasburg

The Federal Deposit Insurance Corporation lists 33,737 bank accounts, and \$34,413,000 in total deposits for banking facilities physically located in Shenandoah County as of June 30, 1966.

Sources: Polk's World Bank Directory, 146th edition, (New York: R. L. Polk & Co., 1967); National Summary of Accounts and Deposits in all Commercial Banks, June 30, 1966, (Washington: Federal Deposit Insurance Corporation, January, 1967).

RELIGIOUS

Many Protestant denominations are represented in the numerous churches scattered throughout the county. There is a Catholic Church in Woodstock and Jewish places of worship are located in Harrisonburg and Winchester, a few miles from the southern and northern boundaries of the county, respectively. Most of the churches maintain Sunday schools, youth programs, and other activities that make an important contribution to community life. Shrine Mont at Orkney Springs is owned by the Episcopal Diocese of Virginia and here religious conferences are held from May to September of each year.

MEDICAL

The county is served by the Shenandoah Memorial Hospital, an 80-bed, 12 bassinets hospital at Woodstock with well-equipped medical, surgical, pediatric and obstetrical departments. Hospitals in Winchester, Harrisonburg, and Front Royal are also within easy reach. In Woodstock is the Susan B. Miller Nursing Home, an accredited 68-bed home for the nursing of chronically ill and aged patients. Sixteen medical doctors practice in the county and five of the towns have pharmacies. The County Public Health Department, staffed by a director, physician, public health nurses, sanitarians, and clerk, has offices in Woodstock and dispenses clinic and other health services throughout the county. There are also three qualified veterinary hospitals in Shenandoah County.

SECTION XII - NATURAL RESOURCESMINERALS

Shenandoah County is situated in the Valley and Ridge province and is underlain by sedimentary rocks. Several limestone and dolomite formations trend across the county in a northeasterly direction, and during 1967 a number of companies were active in the production of these rocks. The Shenandoah Valley Lime and Stone Corporation produced limestone at underground operations near Strasburg that was crushed and marketed principally as metallurgical flux and for crushed stone use. The Strasburg Ag-Lime Company, Inc., pulverized and marketed limestone from this operation for use as agricultural limestone. Some dimension stone was also produced at this site and marketed under the trade name "Shenandoah Stone." The Chemstone Corporation, Subsidiary of Minerals and Chemicals Phillipp Corporation, operated a quarry in limestone, also near Strasburg. The limestone was crushed chiefly for use in the manufacture of lime in the company's lime plant at the site, which utilized four vertical kilns and one calcimatic kiln. The Virginia Asphalt Paving Company, Inc., operated a plant at the Chemstone quarry to crush rock from large accumulated stockpiles for use as crushed stone and in asphalt. C. S. Mundy Quarries, Inc., produced limestone near Forestville for crushed stone purposes, and the Toms Brook Lime and Stone Company, Inc., produced limestone and dolomite near Toms Brook for use as crushed stone and agricultural stone. The Kipps Magnesium Limestone Quarry produced agricultural stone at a quarry near Forestville.

In the past, manganese, iron, and zinc minerals, clay, sand, and gravel have also been produced in the county. Manganese ore has been mined or prospecting at numerous localities, chiefly in the Cedar Creek Valley-Capola Mountain and Massanutten Mountain areas and near Toms Brook. Iron minerals have been mined in the western part of the county and also in the southeastern part on Massanutten Mountain. Prior to the Civil War, this county was one of the leading counties in Virginia in the production of iron ore. Zinc ore was mined on a small scale at the Timberville mine near Forestville, and lead and zinc mineralization occur at several other localities in the southern portion of the county. Clay has been produced near Woodstock and Strasburg for use in the manufacture of brick, and clay near Strasburg was used to make pottery. Shales at selected localities in the county have been tested and found potentially suitable as raw materials for brick, tile, and lightweight aggregate. Sand and gravel have been obtained near Edinburg and Maurertown, and sandstone occurs along Massanutten Mountain and at other localities in the county.

Source: Information provided by Department of Conservation and Economic Development, Division of Mineral Resources.

GROUND WATER

Shenandoah County is in the Ridge and Valley province and is underlain by limestone, sandstone, and shale formations. These rocks are generally inclined either to the northwest or southeast, and are exposed on the surface as relatively narrow belts that cross the county in a northeasterly direction.

Springs, cisterns, and dug wells supply much of the domestic and farm water requirements in all parts of the county. These sources of water are dependent upon precipitation and a shallow water table, often vary in yield with the change

GROUND WATER (Continued)

of seasons, and are susceptible to surface pollution. The water is generally softer and less mineralized than that from deeper, drilled wells, except for spring water that may be moderately hard to hard. Along the base of several of the mountains a veneer of alluvium overlies the bedrock. Water from this shallow zone is sufficient only for domestic needs, and the difficulty of well construction often makes it necessary to case off the unconsolidated material.

Approximately 70 percent of all drilled wells are less than 200 feet deep, and only 10 percent are deeper than 400 feet. In the valley of the North Fork Shenandoah River, between U. S. Highway 11 and the Massanutten Mountains, most wells penetrate shale and average 100 feet in depth; between U. S. Highway 11 and Little North Mountain, most wells penetrate limestone and average 110 feet in depth. In the mountainous region west of Little North Mountain, wells penetrate sandstone and limestone, and average 120 feet in depth. Only eight wells in the county are reported to be deeper than 500 feet, the deepest of which is a 1200-foot well in the Elizabeth Furnace Recreation Area.

Approximately 80 percent of the drilled wells yield less than 20 gallons per minute, 7 percent furnish between 20 and 100 gallons per minute, and only 4 percent produce more than 100 gallons per minute. Wells that have the largest yields are located in the central portion of the county and obtain water from solution channels and caverns in limestone. Most of the wells that yield more than 20 gallons per minute encountered water-bearing conditions between 50 and 155 feet below the ground surface. The three most productive wells penetrate limestone rocks between New Market and Edinburg; each yields slightly more than 200 gallons per minute and is less than 325 feet deep.

The ground water from wells between U. S. Highway 11 and the Massanutten Mountains contains more dissolved solids than the water produced elsewhere in the county. The moderately-hard water in this portion of the county is usually corrosive to some degree, and iron and sulfur are often present in objectionable amounts. Limey and ocherous material frequently discolor the water produced from a new well, but this condition is often cleared by pumping. In the central portion of the county the calcium and magnesium carbonates make the water moderately hard to hard, but the total dissolved solids is low. Iron and sulfur are sometimes present, but seldom in objectionable amounts. Mud conditions are common in new wells located in this portion, but often can be eliminated by several hours of continuous pumping. In the western portion of the county the water is generally soft to moderately hard, and frequently is high in iron and silica. Sulfurous and acidic conditions have been reported in only a few of the wells.

Industrial supplies of water are available at selected well sites in many of the valleys throughout the western two-thirds of the county. The success of these wells is usually dependent upon the penetration of fracture or solution openings, the locations of which are unpredictable but are usually encountered in the first 250 or 300 feet of bedrock. In the eastern third of the county moderate ground water supplies are developed from bedding planes, fractures, and joints in the rock, or from the contact between two types of bedrock in areas with adequate recharge.

Source: Information provided by Department of Conservation and Economic Development, Division of Mineral Resources.

SURFACE WATER

The main stream in Shenandoah County is the North Fork of the Shenandoah River. Smaller streams in the county are Passage Creek, Cedar Creek, and Stony Creek. There are also a number of good springs in the county and measurements of flow are available for some of them.

Several stream gaging stations in this area provide good information concerning the available water resources. Stream gaging stations are located on North Fork Shenandoah River near Mount Jackson and another downstream near Strasburg. There is a stream gaging station on Cedar Creek north of Strasburg and a station installed in 1960 on Smiths Creek near New Market. There is a station on Passage Creek near Buckton two miles downstream from the Shenandoah-Warren County line. Data are available on both the quantity and quality of waters in North Fork Shenandoah River, Cedar Creek and Passage Creek. Flow duration and high- and low-flow sequence data are available for many of the stations with long records.

During periods of normal rainfall there is a large volume of water in the streams. During droughts the smaller streams become quite low, but there is still a good flow in the North Fork of the Shenandoah. Some of the springs offer very good possibilities. The water in these springs is hard, but its cool temperature is an advantage for some industrial uses.

The quality of water varies considerably. In the small streams originating in the mountain ridges, water is soft. In the main streams in the valleys and springs water is quite hard. The small mountain streams have slightly acidic water whereas the valley streams are alkaline.

<u>Stream Gaging Station</u>	<u>Average Stream Flow Million Gallons per Day</u>
North Fork Shenandoah River at Mount Jackson	225
North Fork Shenandoah River near Strasburg	360
Cedar Creek near Strasburg	54
Passage Creek near Buckton in Warren County	24

Source: Information provided by Department of Conservation and Economic Development, Division of Water Resources.

FOREST

According to the 1965 Forest Survey, Shenandoah County contains approximately 168,386 of commercial forest land and 17,800 acres of non-commercial forest land. The 1957 Forest Survey listed 167,560 acres of commercial forest and 18,300 acres of non-commercial forest land.

The ownership of commercial forest land in Shenandoah County is 65.7 percent in private holdings. The remaining 34.3 percent is accounted for in National Forest land.

Growth was exceeding cut volumes in all species groups and sizes in 1965. Sawtimber production has been decreasing during recent years and pulpwood production has remained about the same for the past three years.

FOREST (Continued)

Markets exist for most types of forest products but number of sawmills are decreasing and lumber production is generally decreasing. Pulpwood markets are available but there is a need for a greater demand and cutting of the smaller size hardwoods.

The major forestry needs are timber stand improvement, cull disposal, protection of timber stands from grazing, and reforestation of idle and cut over forest land. Interest in this type of work by private landowners is increasing.

Table 20.--Selected Forestry Information

Forest Types:		Acres
Virginia pine		17,847
Oak-pine		22,120
Oak-hickory		98,482
Chestnut oak		27,801
Southern scrub oak		2,136
Total		168,386

Stand Size Classes:		Acres
Sawtimber		65,605
Pole size timber		77,794
Seedlings and saplings		24,987
Total		168,386

Inventory by Species Groups, 1965:	Sawtimber ^{a/} (Million board ft.)	Growing Stock ^{b/} (Thousand cods.)
Softwoods	71.9	463
Soft hardwoods	17.6	112
Hard hardwoods	285.0	1,582
Total	374.5	2,157

Estimated Current Annual Net Growth and Cut, 1965:

Species Group	(million board feet)		Growing stock (thousand cords)	
	Growth	Cut	Growth	Cut
Softwoods	2.0	.9	14	5
Soft hardwoods	1.0	--	4	-
Hard hardwoods	11.3	.4	55	1
Total	14.3	1.3	73	6

^{a/} Softwoods 9" DBH and over; hardwoods 11" DBH and over. DBH refers to diameter at breast height. The stem diameter is measured in inches and covers the outside bark measured at 4½ feet above the ground.

^{b/} Growing stock, all merchantable trees 5" or over, DBH.

Source: Information provided by Department of Conservation and Economic Development, Division of Forestry.

SECTION XIII - MAJOR FEDERAL AND STATE PUBLIC LANDS

Table 20.--Federal and State Public Lands

Federal	Acres	State	Acres
George Washington National Forest.....	75,841.00	Memorial to V.M.I. Cadets.....	0.01
Woodstock Post Office.....	0.50	Department of Highways-residue.	0.38
Strasburg Post Office.....	0.40	Woodstock Access area (Chapman's Landing).....	2.50

Source: Federal and State Agencies.