

Business Sector Analysis

Christian County has experienced significant growth in the number of business establishments over the past 25 years, increasing from 163 businesses in 1965 to 703 establishments in 1999 (County Business Pattern Report, 1999). Since 1980, the greatest growth has occurred in the Construction sectors. The cities of Nixa and Ozark account for over half of the County's economic activity.

As noted in Table 5-2, the greatest number of businesses is in the service, retail and construction sectors. The largest number of businesses is in the service sector, with health and business services accounting for the majority of payroll dollars. The service and retail sectors together account for over 51.7% of all business establishments in the County. Manufacturing employs the greatest number of people (2,863 employees).

Much of the business growth that has occurred in the past several years is in firms that employ 1-19 persons. Approximately 73.6% of all business establishments in the County have less than 10 employees and there are only 10 firms which employ 100 or more persons. The largest employer is Wal-Mart, a retail chain which employs 494 in the cities of Nixa and Ozark. Nixa and Ozark School Districts are the second and third largest employers, the school districts employ 442 and 425 persons, respectively. Other top employers in the county are Diversified Plastics, employing 125, Lamberts, employing 120, and Ozark Riverside Manor, employing 115.

TABLE 5-2
NUMBER OF BUSINESSES AND EMPLOYEES, March 2000

Sector	No. of Businesses	% of Total	No. of Employees	% of Total
Agriculture Services	29	2.3%	104	0.8%
Mining	2	0.2%	----	----
Construction	191	15.4%	1,145	9.1%
Manufacturing	102	8.2%	2,879	22.9%
Transportation & Utilities	73	5.9%	416	3.3%
Wholesale	80	6.4%	467	3.7%
Retail	204	16.4%	2,882	22.9%
F.I.R.E.	130	10.5%	642	5.1%
Service	255	20.5%	1,969	15.6%
Government	171	13.8%	2,080	16.5%
Unclassified	6	0.5%	8	0.01%
Total	1,241	100.0%	12,592	100.0%

Source: U.S. Bureau of the Census, *1999 County Business Patterns*.

Note: *Table 5-2 does not include government and railroad employees or self-employed persons.*

Agricultural Sector

Christian County's most basic economic activity is agriculture. Historically the mainstay of the County's economy, the agricultural sector is in decline, in terms of both numbers of working farms and percentage of total personal income generated. The decline in the number of farms follows national and state trends. The number of Christian County farms decreased from 1,278 in

1992 to 1,209 in 1997, a 5.7% decrease. This percentage decrease is less of that experienced by the State of Missouri during the same time period (-9%), but is also more than eight times the national trend (-0.6%).

The average farm size in Christian County is increasing. The average farm is approximately 168 acres, that's up from 165 acres in 1992. There has also been an increase since 1992 in the number of farms over 1,000 acres in size. The sale and consolidation of smaller farm ownerships into larger units may partially account for the overall decrease in total number of farms since 1992.

The small size of farms and income generated from commodities sales suggest that many farmers are involved in farming activities only part-time and may have other sources of employment and personal income. In 1997, 68.9% of all farms in the County had annual sales of less than \$10,000 (U.S. Department of Agriculture, 1997). Personal income generated from agriculture is also a very small percentage of total personal income in the County. Farm personal income decreased from 5.6% to 0.5% between 1981 and 2002.

Labor Force Characteristics

Christian County's labor force is defined as those persons 16 years of age and older who are employed or who are available for employment. The County's labor force has increased greatly over the past 30 years, from 6,800 persons in 1970 to 28,763 persons in 2000. Between 1990 and 2000 the labor force increased by 12,077 persons, a 72.4% increase. This compares to an 11% increase in the labor force for the State of Missouri during the same time period.

Labor force participation rates for Christian County and the State of Missouri between 1980 and 2000 are noted in Table 5-3. While participation rates for males have remained relatively constant since 1970, there has been a significant increase in the female participation rate for both

Christian County and the State. The substantial increase in the female participation rate follows national trends and supports the observation of increases in two-income households.

TABLE 5-3
LABOR FORCE PARTICIPATION RATES

Area	1970	1980	1990	2000
Christian County				
Male	74.7%	74.9%	78.0%	78.7%
Female	35.7%	46.8%	60.2%	62.8%
Missouri				
Male	71.7%	74.2%	73.6%	71.6%
Female	39.3%	49.9%	56.4%	59.2%

Source: U.S. Bureau of the Census, *Missouri Statistical Abstract, 1970, 1980; STF 3 Profile, Selected Characteristics, Christian County and Missouri, 1990, 2000.*

Employment rate trends in Christian County since 1970 have remained fairly consistent with larger state and national trends. As shown in Table 5-4, the County's highest unemployment rate during recent census periods occurred in 1980 when the unemployment rate was 5.5%. Although the County's employment rates have followed state and national trends, the County's economy has been expanding at a faster pace. Overall, the region has maintained an expanding employment market. For example, Christian County's labor force increased by over 72.4% between 1990 and 2000. During this same period, there was only a 15% increase in the number of unemployed persons.

The County's 2000 unemployment rate was 2.3%, a decrease since 1990. It should be noted, however, that these figures represent unemployment levels at the time of the 2000 Census and do not cover the recessionary period of the past two years. More recent data from the Missouri Division of Employment Security indicated a total of 1,280 unemployed persons in August 2002.

Of those unemployed in Christian County in 2000, 69.7% were under the age of 45. The greatest number of unemployed persons was in the age group 35-44 years (23%). Also, the majority of those unemployed were males (57.9%). Review of 1991 unemployment by occupational sector indicates that 30.5% of the unemployed last worked in the Service sector. The second highest percentage of unemployment was in the Manufacturing sector (24.9%). Overall, the Agriculture, Finance, Mining and Public Utilities sectors had the lowest percentages of unemployment during 1991 (Missouri Department of Employment Security, 1991). Updated Statistics are due out in November 2003.

TABLE 5-4

LABOR FORCE EMPLOYMENT RATES

Year	Labor Force	Number Employed	Number Unemployed	Rate
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1970				
Christian Co.	6,800	6,710	90	3.2%
Missouri	1,927,000	1,864,000	63,000	3.3
1980				
Christian Co.	10,680	10,090	590	5.5%
Missouri	2,295,000	2,134,000	161,000	7.0
1990				
Christian Co.	16,686	15,889	766	5.3%
Missouri	2,511,000	2,348,000	163,000	6.1
2000				
Christian Co.	28,763	27,770	921	2.3%
Missouri	2,822,010	2,657,924	148,794	3.4%

Source: U.S. Bureau of the Census, *Statistical Abstract of United States, 1961*; *Missouri Statistical Abstract, 1970, 1980, 1990*; *STF 3 Profile Report, Selected Characteristics, Christian County, 1990, 2000*.

Labor Force by Occupation and Industry

The characteristics of Christian County's labor force may be evaluated by both type of occupation and type of industry. Note that the following census information provided is based on place of residence (Christian County), not place of employment.

The County has experienced significant changes in the occupational structure of its labor force since 1960. All occupations have grown tremendously between 1960 and 1990 with the exception of Farming, Fishing, and Forestry occupations. Farming in particular has experienced significant decline. In 1960, farming was the most common occupation, accounting for 31.4% of employed persons. By 2000, farming had dwindled to the smallest occupation, accounting for only 0.6% of the employed labor force.

Table 5-5 lists the changes in occupation structure between 1980 and 2000. As shown, the top five occupations of employed persons in the County in 2000 by rank order were:

1. Professional Specialty
2. Administration Support, Technical and Clerical
3. Executive, Managerial, Administrative and Professional
4. Technical, Sales and Administrative Support
5. Services (excluding household and protective services)

*TABLE 5-5
OCCUPATION OF EMPLOYED PERSONS
(16 Years and Older)*

<u>Occupation</u>	<u>Estimate</u>	<u>Percentage</u>
Management, professional & related	11,482	31.9%
Service occupations	5,311	14.8%
Sales & office occupations	10,188	28.3%

Farming, fishing & forestry operations	91	0.3%
Construction, extraction, maint. & repair	4,080	11.3%
Production, transportation & materials moving operations	4807	13.4%

Source: *U.S. Bureau of the Census, 2005 - 2007 American Community Survey 3 - Year Estimates*

Figure 5-1 depicts employment patterns by industrial sector in 2000. As shown, over 1/4 of employed persons work in the Service sector (5,414 persons or 28.16%). The Service sector, in fact, has experienced the greatest percentage of growth with over a 2000% increase in number of employees between 1970 and 2000. Other top employment sectors include Retail Trade (22.95%), Manufacturing (15.74%) and Construction (14.03%). Given Christian County's continued rapid growth in the early part of the 1990s, it is anticipated that these economic trends will continue and that services, retail trade, manufacturing and construction will continue to be the dominant employment sectors during the decade.

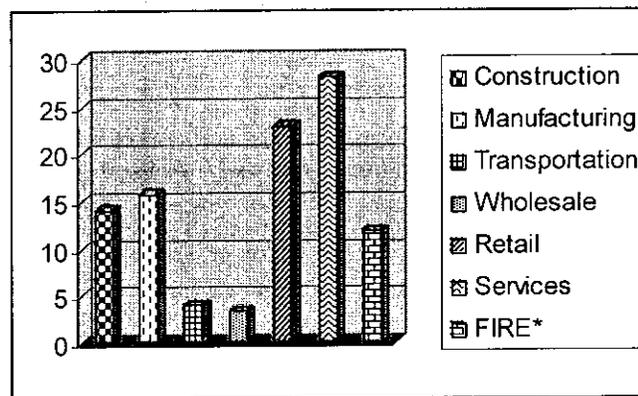
*TABLE 5 - 6
CIVILIAN EMPLOYMENT BY INDUSTRY
(16 Years and Older)*

Industry	Estimate	Percent
Agriculture, forestry, fishing, hunting & mining	487	1.4%
Construction	3,290	9.1%
Manufacturing	3,495	9.7%
Wholesale trade	2,054	5.7%
Retail trade	4,723	13.1%
Transportation, warehousing & utilities	2,003	5.6%

Information	786	2.2%
Finance, insurance, real estate, rental & leasing	2,267	6.3%
Professional, scientific, management & administrative	3,046	8.5%
Educational services, health care & social assistance	7,526	20.9%
Arts, entertainment, recreation & hospitality	3,257	9.1%
Other services except public administration	1,742	4.8%
Public administration	1,283	3.6%

FIGURE 5-1

EMPLOYMENT BY INDUSTRY



* FIRE – Finance, Insurance, real Estate

Source: U.S. Bureau of the Census, STF 3 Profile Report, Selected Characteristics, Christian County, 1990.

Income Characteristics

In 1999, the median household income in Christian County was \$38,085, increasing from \$25,995 in 1989. The County's median household income is slightly higher than that of the State of Missouri (\$37,934) but is lower than the United States (\$41,433). The 1999 per capita income for Christian County (\$18,422) is lower than state and national figures.

Table 5-6 categorizes 1999 household income levels for the County. Over 20% of the County's households reported annual income falls within \$50,000-\$74,999. This is a large increase in income compared to 1989 when the highest percent, 21%, reported an annual income is between \$15,000-\$24,999.

The economic well being of Christian County, along with the potential need for various public assistance programs, is reflected in part in the numbers of people with incomes below the poverty level. In 1999, 4,869 persons in the County had incomes below the poverty level. This represents 9.1% of all persons for whom poverty status was determined, a decrease from 10.1% in 1989. Of those persons below the poverty level in 1999, 1,562 or 34.6% had incomes less than 50% of poverty level.

TABLE 5-6

HOUSEHOLD INCOME AND BENEFITS (In 2007 Inflation Adjusted Dollars)

Income	Number Households	Percent of Total
Less than \$10,000	506	2.5%
\$ 10,000 – 14,999	691	3.4
\$ 15,000 – 24,999	1,693	8.3
\$ 25,000 – 34,999	2,648	13.1
\$ 35,000 – 49,999	3,733	18.4
\$ 50,000 – 74,999	5,133	25.3
\$ 75,000 – 99,999	3,189	15.7
\$100,000 – 149,999	1,926	9.5
\$150,000 – 199,999	378	1.9
\$200,000 or more	389	1.9
Total	26,380	100.0%

Source: U.S. Bureau of the Census, *2005 - 2007 American Community Survey 3 - Year Estimates*

Over 42% of persons below the poverty level are under the age of 18. Also, 8.6% of persons below the poverty level are retirement-aged (65 years and older). It was previously noted that females tend to have lower incomes than their male counterparts. This observation is supported in the percentage of female-headed households below the poverty level. Of 5,206 persons in households headed by females, 1,684 or 32.3% are below the poverty level. Clearly, poverty status is most acute for persons in the dependent age years, including both children and retirees.

PHYSICAL CHARACTERISTICS

Physical variables refer to topography, geology, hydrology, weather and climate, geomorphology, and soils. The physical environment contains each of these variables, all of which may have an impact on development potential. Physical variables are addressed in this chapter of the Plan in order to identify areas where development may be constrained or where development may pose a hazard to environmental quality. Many of the aforementioned physical variables are uniform throughout Christian County; a general overview of these characteristics is provided in the following pages. Emphasis is placed, however, on soils, geomorphology and hydrology due to the constraints each impose upon development potential in the County.

Topography-Elevation

Christian County is situated on three landforms--the Springfield Plateau, the Salem Plateau, and the Eureka Springs Escarpment (see Figure 6-1). Most of the northern portion of Christian County is on the Springfield Plateau. The Salem Plateau is located mainly in the southeastern portion of the County with a small area in the south central region. The Eureka Springs Escarpment crosses the County from the northeast to the southwest, thus dividing the Springfield and Salem Plateaus.

The County exhibits many different topographic features ranging from gently rolling hills to rugged bluffs and valleys. The highest point in the County is located in the northeast portion of the Springfield Plateau with an elevation of 1590 feet. The lowest point of elevation, 830 feet, is located on the Salem Plateau where Swan Creek enters Taney County. With these great variances in elevation throughout

REGIONAL PHYSIOGRAPHY

Source: Sverdrup, 1984.

Christian County, steep slopes do pose some constraints and hazards to development as well as potential soil erosion from removal of vegetative ground cover.

The entire County is marked with sinkholes and karst, indicating that the surface topography is connected with the underground geological features. Sinkholes represent a potentially serious hazard to development in several areas of Christian County; sinkholes are discussed further in the section on hydrology and drainage.

Geology

The term geology refers to the earth's crust and the development of its various layers. Christian County is underlain by eight rock units and one unconsolidated unit (see Figure 6-2). Each of these rock formations outcrops in different parts of the County. The depth of the soil and residuum (unconsolidated materials) throughout the County ranges from 10' to 60'. The remaining rock formations range from 0' to 180' below the surface. The most prominent rock formations in Christian County are the Cotter, Northview, Reeds Spring/Elsey, and Burlington/Keokuk Formations.

The Cotter Formation is the oldest and most deeply buried rock unit. It outcrops at the surface in the rugged hills and valleys in the southwestern and south-central portion of the County. There is a sandstone unit within the formation, which furnishes small amounts of groundwater that recharge many springs in the valleys of southern Christian County. This poses some hazard to well construction due to the direct access to surface waters and potential contaminants.

The Northview Formation is a thin but important rock layer ranging in thickness from 5 - 20 feet. The formation consists of siltstone and shale. The shale portion of the formation acts as a barrier against the downward percolation of groundwater. Many springs appear at the top of the Northview Formation;

FIGURE 6-2

GENERALIZED COLUMNAR SECTION OF ROCK UNITS
FOR CHRISTIAN COUNTY

Source: Jerry D. Vineyard and Larry D. Fellows, *Missouri Geological Survey and Water Resources*, R1 37, 1969.

the groundwater percolates downward to the shale and then moves laterally until reaching a gully or valley and resurfacing as a spring. The Northview Formation can be thought of as a divider between shallow and deep groundwater in Christian County. Due to the shallow percolation of waters, well water from aquifers in the Northview Formation are much more prone to contamination from surface pollutants.

The Reeds Spring and Elsey rock units are difficult to separate from each other, and so are often identified collectively as the Reeds Spring/Elsey Formation. This formation is composed of alternating layers of limestone and chert, ranging from 80' - 150' feet in thickness. The formation appears in all parts of the County, but occurs mainly on the hillsides bordering the James River and Finley Creek. This formation is important in the development of soils. The soils are very cherty and gravelly, with depths ranging from less than 1 foot to more than 15 feet. Development of on-site sewage disposal systems should be carefully monitored in these areas due to the porosity of the soils and potential for groundwater contamination.

The Burlington/Keokuk Formations are also separate rock units, but because they are difficult to distinguish from one another, are considered a single unit. The formation represents the uppermost layers of bedrock in much of Christian County, and is comprised of limestone ranging from 100 - 150 feet in thickness. The formation crops out in the central portion of the County and in northern stream valleys.

The weathering process that takes place in this formation causes a sharp but irregular boundary with the above-lying residual soil material, resulting in pinnacles and cutters. Pinnacles and cutters are peak-and-valley-like variations in the bedrock surface with as much as 12 feet of relief. The pinnacles are hard limestone bedrock, while the cutters are comparatively soft residual materials. Pinnacles and cutters create problems for development because of their irregularity,

difficulty of detection prior to excavation and increased costs during construction (Porter and Thomson, 1975).

Structural features are those geologic features formed through the deformation of bedrock, principally by uplifting, faulting, and volcanic activity. Structural features may include uplifts and basins, folds, faults, and joints.

There are four main structural features within Christian County, including the Chesapeake, Sac River, Ponce de Leon, and Highlandville Faults (see Figure 6-3). The Chesapeake Fault is located in the extreme western region of the County. The portion of the fault lying in Christian County runs from the Lawrence-Christian County line west of the town of Billings and extends in a southeasterly direction (McCracken, 1971). Although not a significant threat to development, construction should try to avoid the fault line.

The Sac River Fault parallels the Chesapeake Fault and runs from just north of the City of Nixa to where the James River crosses the Greene-Christian County line. Where exposed at the surface, the displacement is up to 60 feet and is downthrown to the northeast side of the fault. It is common to have brecciated areas along this fault. Breccia is very porous rock composed of coarse angular fragments. Surface water and pollutants can easily pass downward through the brecciated material, thus creating potential for groundwater contamination.

The Ponce de Leon Fault is located principally in Stone County, but extends east-southeasterly into the extreme southwest corner of Christian County, just south of Spokane. This fault area does not pose a great threat to development. However, as with any fault, construction should try to avoid the fault line.

The Highlandville Fault runs from the Stone-Christian County line, northwest of Highlandville, in a southeasterly direction to approximately U.S. Highway 65. This fault area does not pose a significant threat to development.

Hydrology and Drainage

The surface waters in Christian County drain in a southerly direction with the exception of the extreme panhandle portion of the County. Most waters eventually drain into the White River from the James and Finley Rivers and from Swan and Bull Creeks. The small area draining north includes the Pickeral and Turnback Creeks, which drain into the Sac River.

Small amounts of groundwater are produced by several of the exposed bedrock formations in the County. These formations include the Burlington-Keokuk, Elsey, Reeds Spring and Pierson, which produce 1 to 20 gallons of water per minute in shallow wells. The major sources of groundwater are the Ordovician-aged dolomites (350-410 million years) trapped below the Northview Formation. Wells in these areas are generally more than 1000 feet deep and produce 300 to 1000 gallons of water per minute.

The term karst is applied to topography formed in regions underlain by calcium-rich limestone or dolomite bedrock. Surface water enters fractures and joints in the bedrock, enlarging these features as calcium is dissolved. Sinkholes, caves, and losing streams are produced which, after time, form a vast underground drainage network connecting surface water with underlying groundwater. Consequently, wells and springs, which obtain their water from these aquifers, can easily be contaminated by the presence of pollutants in the surface water. It is for this reason that any development in a karst region should be carefully planned and engineered. Contaminated effluent from poorly designed

GEOLOGIC FEATURES

HYDROLOGY

livestock facilities, landfills, or sewage disposal facilities can quickly pass into the groundwater supply, thereby resulting in groundwater pollution.

Much of Christian County is considered a sensitive karst region. The northcentral and northwestern parts of the County have been classified by the Missouri Department of Natural Resources (DNR) as a sensitive area for well construction due to the karst topography. A recent study of 60 wells throughout Christian County found that water from 50 percent of the wells was unsafe for human consumption. Of the wells found unsafe, 13.3% tested positive for Ecoli.

Overall, the County has hundreds, perhaps thousands, of sinkholes ranging in size from small dimples a few yards in diameter to several acres in area. There are probably many more sinkholes than those that can be seen on the ground, but they are covered with chert and/or residuum and are therefore hidden from view (U.S. Department of Agriculture, 1985). The most extensive region of sinkholes in the County lies just north and west of the City of Nixa. The largest sinkholes in this area are the Aven and Deffenderfer Sinks.

Field surveys have indicated that many of the sinkholes in the County are used as trash dumps or serve as conduits for movement of feedlot wastes into the groundwater system. Trash dumping in sinkholes has negative consequences for groundwater quality as pollutants can enter the groundwater with little filtration. Further study to identify the locations of sinkholes as well as direction of subsurface water flow is recommended.

SCHEMATIC OF AVEN AND DEFFENDERFER SINKS

Source: Porter, James and Thomson, Kenneth C. Geology, Geomorphology and Karst Development in the Nixa Karst Area, Southwestern Missouri, 1975.

Another karst feature common to Christian County is caves. There are some 140 caves that have been identified and documented in the County. These caves are found in limestones and dolomites, with most being located in the Mississippian-aged Burlington and Pierson limestone (260-285 million years), and a few in the Ordovician-aged, Cotter Formation dolomites. Other geologic formations in the County are not conducive to cave formation (Thomson and Martin, 1975).

Climate and Weather

The Christian County area has a continental climate characterized by mild winters and hot summers. Weather data for the area, which have been collected since 1900, are derived from the nearby Springfield Weather Station. The average annual temperature for the Christian County area has been in the fifties during the data collection period (1900-1990). For agricultural purposes, the area has an average growing season of 192 days. The first killing frost occurs around October 23rd and the last killing frost of spring on approximately April 14th.

Prevailing winds are generally from the south-southwest with an average velocity of eight to ten miles per hour. During the winter months, however, cold northwesterly winds from Canada do sweep across the region. The region has experienced numerous destructive tornadoes, with over 980 tornadoes touching down within a 125-mile radius of Springfield since 1950.

Total precipitation for years of record during the reporting period, including melted snow, varies from a low of 25.21 inches in 1953 to a high of 63.19 inches in 1990. Between 1900 and 1990, the Springfield Weather Station reported seven years with precipitation less than 30 inches and nine years with precipitation in excess of 50 inches. Average annual precipitation is approximately 39.47 inches.

Geomorphology refers to the study of landforms. Landform, or the shape of the land, is affected more by precipitation extremes than average precipitation patterns. The energy available to alter the landscape by running water is maximized during periods of excess precipitation. Dry periods are also important in that the protective ground cover provided by vegetation is reduced during dry years. If these dry years are followed by wet years, increased rates of soil erosion will occur. Erosion from running water is an active geomorphic process in the Christian County area and is most common during the fall and winter seasons.

Soils

The Christian County study area contains 17 individual soil series, which are divided into 23 mappable soil units (see Figure 6-6). There are two major differences between these soils in terms of formation. In general, the soils of Christian County were formed in either loess (wind blown silts) or in residual materials from the underlying limestone or dolomite bedrock. The loessal soils tend to be of finer texture, consisting of sandy loam to silty clay. Several of the residuum deposited soil series (i.e. Captina, Creldon, Needleeye, and Wilderness) have a fragipan, which is a brittle,

cement-like subsurface layer. The presence of fragipan limits the penetration of plant roots, greatly reduces downward water movement and limits operation of construction equipment.

Permanent development in low lying areas with a soil fragipan are susceptible to standing water and potential foundation damage during wet periods as downward percolation of water is restricted. Soils with fragipan also have severe limitations for installation of septic tank systems. Substantial land areas along Highway 14, around the cities of Nixa and Ozark have fragipan conditions; standing water during the wet season is common in these areas.

Prime farmland soils are those soils that are best suited for producing feed and crops and which have properties favorable for the sustained high yield of crops. Approximately 28,000 acres (8%) of Christian County are considered prime farmland. These areas are mostly in the northern portion of the County and are used for hay and pasture, with some used for row crops. Many of the County's prime farmland soils lie in the path of urban development. The soil associations that are considered prime farmland include Tonti-Wilderness, Bolivar, Creldon and Peridge-Huntington (see Figure 6-7).

The General Soils Map (Figure 6-6) and Prime Farmland Map (Figure 6-7) should be used as general guides for development purposes. Any expenditure of funds for construction should be preceded by an on-site inspection by a soil scientist to determine specific soil limitations for that site. Due to the severe limitations for septic tank installation in many of the County's soils, it is further recommended that all construction of on-site individual sewage systems be reviewed by a sanitary engineer to ensure appropriate installation and lateral field design and size.

A narrative description of the 17 soil series in the Christian County area is found in Appendix B. Also included in Appendix B are a series of tables that list average properties and

development limitations of the various soil series in Christian County. These tables should be referenced during the development review process.

GENERAL SOILS MAP

PRIME FARMLAND SOILS

EXISTING LAND USE

Land use refers to the activities of man and natural elements that are affixed to the earth's surface. All land can be described as being used in some manner, whether it be a man-made activity such as housing or agricultural production or a natural use such as trees, water or grasslands. The manner in which land is currently used is a key factor affecting future development potential.

Methodology

Existing land use data for Christian County was compiled by joining data from the County Assessors office with GIS technology to produce mapping and statistical analysis with information based on each parcel of land. This information was augmented with aerial photography interpretation as well to consider natural features in assessing the county's existing land usage.

Land use data were aggregated into general use categories, which are discussed in the following pages. For analysis purposes, agricultural uses were grouped into three categories: (1) crop production, (2) dairy and beef cattle production and (3) hogs and poultry production. Acreage totals for agricultural uses represent the predominant use of the ownership parcel.

The existing land use inventory for Christian County was conducted only for the unincorporated portions of the County. Table 7-1, which summarizes land use acreage totals, includes a total acreage figure for the incorporated cities. This figure includes all forms of land use within the cities, including streets and rights-of-way. All other figures presented are for the unincorporated portions of the County only.

It should also be noted that the land use acreage totals presented here most likely include a degree of error in the determination of forestry acreage and acreage devoted to agricultural

activities. Many of the heavily forested areas in the central and southern part of Christian County are used for cattle grazing, an activity which is not easily detected from road side field surveys or aerial photo interpretation.

The detailed land use classification system used to aggregate specific land uses into general use categories is found in Appendix C. Figure 7-1 displays generalized existing land use patterns.

Residential Uses

Residential uses account for approximately 62% of all developed land in Christian County. Single-family homes are the predominant residential use, developed on over 21,000 acres of land. Low-density residential development is the norm; throughout the rural areas of the County, there are few ownership parcels developed in residential use less than five acres. Residential density patterns in close proximity to the County's cities approximate 1-2 dwelling units per acre. Residential density patterns are dictated to a significant degree by lot size required for on-site septic tank absorption fields.

Acreage devoted to moderate or high density residential development (duplexes, apartments) within the County are minimal, with most such uses located in close proximity to the urban areas in the County. Mobile homes and mobile home parks are the second major residential use in the County, accounting for over 3,395 acres or 8.58% of all developed land uses. While mobile homes and mobile home parks are found in virtually all sections of the County, these residential structures are generally concentrated along or in close proximity to Highways 160 and 65 in the central section of the County and in the northeastern third of the County.

The greatest concentration of new residential development is occurring in the growth corridors along Highways 160 and 65, running from the Greene County line on the north to south of the cities of Nixa and Ozark.

Commercial Uses

Commercial uses, which include wholesale and retail trade and service activities such as finance, professional services and commercial recreation, are generally located along the County's major road system, particularly along Highways 65, 160 and 14. Commercial uses represent approximately 0.99% of developed land in the County.

Industrial Uses

Industrial activity, which includes light and heavy manufacturing, extractive industries and communications, utilities and transportation, accounts for approximately 3.3% of all developed land uses. Quarry operations contribute significantly to the acreage totals for industrial activity. As with commercial activity, most industrial activity is concentrated along Highway 65 or along other major roads in the northern section of the County. The largest concentration of industrial activity is located north of the City of Ozark.

Agricultural Uses

Agriculture is the dominant land use in Christian County, with approximately 236,490 acres or 65.61% of the land area in the County devoted to agricultural activity. Most field crop and hay production is found in the prime farmland soils area in the northern third of the County. Dairy and beef cattle production are found throughout the County; however, a concentrated area of dairy cattle production is located in the northern panhandle section of the County, around the communities of Billings and Clever. Beef cattle grazing are also located throughout the forested areas in the central and southern portions of the County. As noted, dairy and beef cattle account for most of the animal husbandry activities in the County. Approximately 100 acres of land is devoted to hog production.

Forestry Uses

Extensive portions of the central and southern part of Christian County are devoted to forest cover, including both privately owned land (21,608 acres) and lands in the Mark Twain National Forest (51,312 acres). The extensive National Forest acreage in the southern third of the County precludes significant concentrations of urban development in this area. As indicated, many of the privately owned forestlands are used for cattle grazing.

Parks and Recreation

Approximately 3,836 acres of land in the unincorporated portions of the County are devoted to parks and recreation use. This figure includes Missouri Department of Conservation Lands, such as Busiek Park and the James River public access sites. Wilson's Creek National Battlefield is also included in this category.

General Land Development Trends

As shown on Figure 7-1, the heaviest concentrations of urban development are found in the northern third and central section of the County, with development occurring along the Highway 65, 160 and 14 corridors in close proximity to Nixa and Ozark. Growth pressures are resulting in the conversion of prime farmland soils in these areas to urban development.

In general, the development pattern throughout the southern half of the County is one of very low density residential on scattered lots or smaller subdivisions. Density levels increase in close proximity to the Cities of Nixa and Ozark. However, development patterns in these areas are still considered low density, with most residential uses developed on lots of at least one acre or larger.

The County has experienced considerable new growth and development over the past decade. While there has been an increase in commercial and industrial uses during this time period,

the significant majority of new development has been in residential uses. As might be expected, much of the County's new industrial and major commercial development over the past several years has occurred within the incorporated cities due to the availability of municipal water and sewerage services.

TABLE 7-1

EXISTING LAND USE IN 1991 - 1992

Land Use	Acres	% of Total	% of Developed
Residential	24,842.4	6.89	62.75%
Single Family	21,391.8	5.93	54.04

Duplex	45.2	0.01	0.11
Multi-Family	5.1	--	0.01
Group Quarters	4.9	--	0.01
Mobile Homes	2,936.1	0.82	7.42
Mobile Home Parks	459.3	0.13	1.16
Commercial	390.3	0.11	0.99
General Commercial	162.5	0.05	0.41
Heavy Commercial	227.8	0.06	0.58
Industrial	1,309.1	0.36	3.31
Light Industrial	73.4	0.02	0.19
Heavy Industrial	830.5	0.23	2.10
Communication/Utility/ Transportation	405.2	0.11	1.02
Public/Semi-Public	856.0	0.24	2.16
Parks & Recreation	3,836.8	1.06	9.69
Agriculture	236,490.0	65.61	--
Incorporated Cities	5,255.1	1.46	--
Roads & R.O.W.	8,349.7	2.32	21.10
National Forest	51,312.0	14.24	--
Other Forest	21,608.1	5.99	--
Vacant	6,198.5	1.72	--
Total Acres	360,448.0	100.00%	--
Total Developed	39,584.3	--	100.00%

Source: Center for Resource Planning and Management, field surveys, March 1991-June 1992.

GENERALIZED EXISTING LAND USE

PUBLIC FACILITIES AND SERVICES

Public facilities and services, such as schools, fire protection, law enforcement and libraries, help to shape not only a community's quality of life but also influence future growth and development potential. These facilities and services can affect the decision making process of where to locate as families and businesses enter an area. As private development tends to follow the location of community services (Daniels, 1988), evaluating and planning for current and future public facility and service needs is as an important element of the County's overall future development strategy.

This section of the Comprehensive Plan addresses Christian County's public facilities and services, including schools, law enforcement, fire protection, ambulance/rescue services, libraries, and parks and recreation.

Public Educational Facilities

Thirteen public school districts serve a rapidly growing school-aged population in Christian County. Of these, the Ava, Bradleyville, Fordland, Marionville, Republic and Rogersville Districts do not have any school facilities in Christian County and serve only a few students from the County (Table 8-1). Figure 8-1 shows the service area boundaries of the school districts in Christian County. Table 8-2 summarizes enrollment, facility capacity and tax levy data for the districts with facilities located in the County.

CHRISTIAN COUNTY SCHOOL DISTRICTS

(map)

Billings (R-4) School District

The Billings School District covers a 40 square mile area (7.14 %) in the Christian County panhandle. This district is home to one elementary and one high school. The school facilities, located at 118 W. Mt. Vernon St., Billings, are in good condition. Facilities include 36 classrooms, two gymnasiums, one vocational/agriculture facility, five offices, one cafeteria, one kitchen, and ten restrooms.

Chadwick (R-1) School District

The Chadwick School District covers the largest territory in Christian County (135 square miles or 24.1%). There are three schools located in the district's area--Chadwick R-1. The facilities include 14 classrooms, two gymnasiums, one industrial arts building, four offices and a cafeteria.

The school facilities are generally in adequate condition. In August, 2002, voters narrowly turned down a bond issue for the renovation and additions of the school buildings. The school board is moving forward with plans to put the issue back on the ballot in November 2002. Officials are hopeful that with a lowered tax levy the issue will successfully pass. At that time plans are to improve existing buildings, enlarge the library, enlarge the cafeteria and kitchen area and reconstruct substandard buildings.

Clever (R-5) School District

The Clever School District serves approximately 42 square miles (7.4%) in the panhandle area of the County. There are three schools located within the district, Clever Elementary, Clever Middle, and Clever High School.

The elementary school and high school are in good to excellent condition while the middle school is in average condition. The school facilities include the high school and gymnasium

building, middle school, elementary school building, vocational/agriculture building, pre-school building, metal storage building and a single-family dwelling,

Nixa (R-2) School District

The Nixa School District covers a 49 square mile area (8.75%). Nixa's facilities are all in excellent condition and include eight schools, Century Elementary, Matthews Elementary, George Espy Elementary, Thomas Elementary, Inman Elementary, Main Street Elementary, Nixa Middle School, and Nixa High School.

Century Elementary is the newest school in the Nixa R-2 School District. The facility built in 2001 sits on 32 acres and houses grades K-4. The school located east of town on McCauley Road has 23 classrooms, a computer lab, and a multi-purpose room.

Matthews Elementary is located at 605 S. Gregg Street and sits on 20 acres. The school houses grades K-4 and is in excellent condition. The facility contains 18 classrooms, a computer lab, and a multi-purpose room.

George Espy Elementary is located west of Nixa on Highway 14 and serves students in grades K-4. The building was constructed in 1987, with the addition of 14 new rooms since that time. The building is in excellent condition and contains 30 classrooms, a library, a mobile classroom, and an all purpose room and a kitchen.

Thomas Elementary is located at the corner of Cherry and Market Streets and houses grades K-4. The school was built in 1960 on a 9 ½ acre site and has undergone general maintenance and improvements, including a new roof and four new classrooms in 1985, and then three classrooms, a music room and a library expansion in 1998. The building is in good condition and contains 25 classrooms, a large library, a computer lab, a mobile classroom, and an all purpose room with a stage and a kitchen.

Inman Elementary houses grades 5-6. The facility located on 40 acres, at 1300 North Nicholas Road, is in good condition. The building has 32 classrooms, a computer lab, a library, and a multi purpose gym/ cafeteria.

Main Street School is home to grades 5-6. The building was constructed in the 1940's and has undergone many improvements over the years. The school contains 31 classrooms, a library, kitchen, arts facility, and a gymnasium with a stage.

Nixa Junior High School is located in the old high school building on North Street in Nixa and serves grades 7-8. The structure sitting on 10 acres was built in 1969 and contains 41 classrooms, a library, gymnasium, an all purpose room, an auditorium, kitchen, science laboratories, art facilities, industrial arts shop rooms, home economic rooms, and a track and football field.

Nixa High School was built in 1998 and serves students in grades 9-12. The 225,000 square foot building is in excellent condition and sits on 43 acres. The facility capacity is 1,800 students. In 2002, high school enrollment was around 1,200, a 67% occupancy rate. The state of the art facility includes an enlarged library, a school theater, a football, and a 3,000 seat gym.

Ozark (R-6) School District

The Ozark School District serves a 90 square mile area (15.9%) of the County and is home to six schools--Ozark East Elementary, Ozark North Elementary, Ozark South Elementary, Ozark Upper Elementary, Ozark Junior High, and Ozark High School. All schools are in good to excellent physical condition.

Ozark East Elementary is the newest elementary in the district. The facility built in 1994 is located on Hartley Street. The facility includes 24 classrooms, a gym, and a library. The facility is in excellent condition.

Ozark North Elementary was built in 1993 and houses grades K-4. The facility located on Highway NN, is in excellent condition. The building has 37 classrooms, a computer lab, a library, a gym, and a cafeteria/multi-purpose room.

Ozark South Elementary is located at 1250 W. South Street. It is in good condition and houses grades K-4. The building has 25 regular classrooms 3 special education rooms, cafeteria, and a gym.

Ozark Upper Elementary is located along with Ozark North Elementary and Ozark Junior High on Highway NN. The building is in excellent condition and houses grades 5-6. The building contains 25 classrooms, a gym, a library, and a cafeteria/multi-purpose rooms.

The Ozark Junior High is in excellent condition. It is also is located in the Ozark North complex. The facility includes 35 classrooms, an industrial art lab, a library, a multipurpose room, and a gym.

The current high school is located on Jackson Street and is in good condition. The school consists of 3 buildings, the main school, a west wing, and a shop building, all of which are connected by a canopy. The facilities include 67 classrooms, 3 gyms, a cafeteria, and a shop building.

Two parts of a three phase bond issue has been approved by voters to construct a new high school, scheduled to open in the fall of 2003. 18.9 million of the estimated 20.6 million have been approved and officials are hopeful that the third phase will be passed April of 2003. The three story, 247,621 square foot, brick structure will be complete with 2 gymnasiums, an auditorium, cafeteria, and a courtyard. Upon completion of this new facility, the present high school will be occupied by the junior high. The current junior high will be used to expand elementary school

needs. In the 2000-2001 school year, Ozark North Elementary was at 86% capacity. With the northern part of the school district rapidly growing, the extra floor space will be suitable.

Sparta (R-3) School District

The Sparta School District serves residents in the east-central section of the county, covering a 66 square mile area (11.7%). There are two schools in the Sparta School District, elementary housing grades K-6 and the middle school/high school which is the home to grades 7-12. The schools, which are in good to excellent condition, contain 68 classrooms, two libraries, a multi-purpose room, two gyms and one cafeteria.

Sparta has seen many changes in the last decade. A new elementary was built in 1993 separating the school district into multiple buildings. In 1997, the high school gymnasium was expanded and renovated. Then in 2000, a lunch room, a nurse's office, three classrooms, and a bathroom were added to the elementary facility.

Spokane (R-7) School District

The Spokane School District serves residents in the southwestern section of Christian County. There are three schools within the Spokane School District--Highlandville Elementary, Spokane Middle School, and Spokane High School. The high school facilities which was constructed in 1992, includes 17 classrooms and 2 gymnasiums. The Middle School facility has 13 classrooms and is in adequate condition. The elementary facility is generally in good condition and includes 15 classrooms, one library, one gymnasium, two offices, and one cafeteria.

Outlying School Districts

A total of 317 students from Christian County are served by school districts with facilities located in adjacent counties. These districts are noted in Table 8-1.

TABLE 8-1

SCHOOL DISTRICTS OUTSIDE OF CHRISTIAN COUNTY
2000-2001 CHRISTIAN COUNTY ENROLLMENT

School District	No. Students	Location
Ava R-17	1	Douglas County
Bradleyville R-8	8	Taney County
Fordland R-78	22	Webster County
Marionville R-9	6	Lawrence County
Republic R-10	29	Greene County
Rogersville R-71	251	Webster County

TABLE 8-2
SCHOOL CHARACTERISTICS

District Name	Capacity	Total District Enrollment												Levy			
		2000-2001	K	1	2	3	4	5	6	7	8	9	10		11	12	
BILLINGS Elementary High School	N/A	468	31	35	37	41	25	31	31	--	--	50	42	32	33	\$3.631	
		231	--	--	--	--	--	--	38	42	--	--	--	--	--	--	\$3.798
		237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHADWICK Elementary High School	120	232	15	17	17	15	15	17	--	--	--	--	--	--	--	\$3.621	
	150	136	--	--	--	--	--	--	22	22	13	19	15	24	--	--	
CLEVER Elementary Middle School High School	328	620	47	40	44	70	53	--	--	--	--	--	--	--	--	\$3.900	
	310	254	--	--	--	--	--	40	44	47	--	--	--	--	--	--	
	440	181	--	--	--	--	--	40	44	47	--	--	--	--	--	--	
		185	--	--	--	--	--	--	48	59	42	36	--	--	--	--	
NIXA Century Elementary Espy Elementary Mathews Elementary Thomas Elementary Inman Elementary Middle School High School	0	3715	0	0	0	0	0	0	0	0	0	0	0	0	0	\$3.900	
	600	0	98	90	117	85	85	--	--	--	--	--	--	--	--	--	
	500	475	140	137	123	138	149	--	--	--	--	--	--	--	--	--	
	600	687	171	70	79	83	73	--	--	--	--	--	--	--	--	--	
	500	476	--	--	--	--	270	278	--	--	--	--	--	--	--	--	
	600	548	--	--	--	--	--	286	290	--	--	251	217	190	--	--	
	1200	953	--	--	--	--	--	--	--	--	--	295	251	217	190	\$3.900	
OZARK East Elementary North Elementary South Elementary Upper Elementary Junior High High School	575	3551	N/A	N/A	\$3.650												
	575	489	N/A	N/A	--												
	725	509	N/A	N/A	--												
	600	441	N/A	N/A	--												
	625	564	--	--	--	--	271	293	--	--	--	--	--	--	--	--	
	1050	537	--	--	--	--	--	--	260	277	--	--	--	--	--	--	
SPARTA Elementary Middle School High School	450	652	51	56	59	38	57	49	--	--	--	--	--	--	--	\$3.500	
	225	310	--	--	--	--	--	--	58	48	--	--	--	--	--	--	
	375	168	--	--	--	--	--	--	62	57	57	45	35	37	--	--	
SPOKANE Highlandville Elementary Middle School High School	N/A	730	47	43	57	40	64	61	--	--	--	--	--	--	--	\$4.530	
		312	--	--	--	--	--	--	55	61	--	--	--	--	--	--	
		174	--	--	--	--	--	--	58	55	61	70	54	59	--	--	
		244	--	--	--	--	--	--	--	--	--	61	70	54	59	--	

Source: Missouri Department of Elementary and Secondary Education, www.dese.state.mo.us/directory; School districts records, 2001.

* Table 8-2 includes only those districts with facilities in Christian County.