



1

Introduction



Introduction

Location

Washington County is located in east central of Nebraska, immediately north of Douglas County and the city of Omaha. Washington County is considered part of the Omaha-Council Bluffs Metropolitan Area. The county is bounded on the west by Dodge County; on the north by Burt County; on the east by the Missouri River and the state of Iowa.

The county has five highways crossing the county including US Highway 75 and 30, Nebraska Highways 31, 91 and 133. The county is home to the communities of Blair (county seat), Arlington, Fort Calhoun, Herman, Kennard and Washington.



COMPREHENSIVE DEVELOPMENT PLANNING

The Washington County Comprehensive Development Plan is designed to promote orderly growth and development for the county, as well as providing policy guidelines to enable citizens and elected officials to make informed decisions about the future of the county.

The Comprehensive Development Plan will provide a guideline for the location of future developments and uses within the planning jurisdiction of Washington County. The Comprehensive Development Plan is intended to encourage a strong economic base for the County so all goals can be achieved.

The Comprehensive Development Plan is intended as an information and management tool for County leaders to use in their decision-making process when considering future developments. The

Comprehensive Development Plan is not a static document; it should evolve as changes in the land use, population or local economy occur during the planning period.

THE PLANNING PROCESS

The Comprehensive Development Plan begins with the development of general goals and policies, based upon current and future issues faced by the County and its residents. These are intended to be practical guidelines for addressing existing conditions and guiding future growth.

In conjunction, the data collection phase will be occurring. Data is collected to provide a snapshot of the past and present conditions within the community. Analysis of data provides the basis for developing forecasts for future land use demands, as well as future needs regarding housing and facilities.

The Comprehensive Development Plan is a **blueprint**....designed to identify, assess, and develop actions and policies in the areas of population, land use, transportation, housing, economic development, community facilities, and utilities. The Comprehensive Development Plan contains recommendations that when implemented will be of value to the County and its residents.

The Comprehensive Development Plan identifies the tools, programs, and methods necessary to carry out the recommendations. Nevertheless, the implementation of the development policies contained within the Comprehensive Plan is dependent upon the adoption of the Plan by the governing body, and the leadership exercised by the present and future elected and appointed officials of the County.

PLAN PREPARATION

The Plan was prepared under the direction of Washington County Planning Commission, with the assistance and participation of the Washington County Board of Supervisors; County staff; the Plan Review Committee and citizens of Washington County. The time period for achieving the goals, programs, and developments identified in the Washington County Comprehensive Plan is 20 years. However, the County should review the Plan annually and update the document every 10 years (2025), or when major, unanticipated opportunity arises.



Completing updates every ten years or so will allow the County to incorporate ideas and developments not known at the time of the present comprehensive planning process.

COMPREHENSIVE PLAN COMPONENTS

Nebraska State Statutes require the inclusion of certain elements in a Comprehensive Plan. A "Comprehensive Development Plan," as defined in Neb. Rev. Stat. § 23-114.02 (Reissue 1997), "shall consist of both graphic and textual material and shall be designed to accommodate anticipated long-range future growth." The Comprehensive Plan is comprised of the following chapters and sections:

- Introduction Chapter
- Community Engagement Chapter
- Population Statistics Chapter

- Housing Chapter
- Economics/Economic Development Chapter
- County Facilities Chapter
- Resources/Environmental Chapter
- Energy Chapter
- Land Use Chapter
- Transportation Chapter
- Implementation Chapter
- Washington County Zoning and Subdivision Regulations

The Comprehensive Development Plan is a vision presented in text, graphics and tables representing the desires of the County and its residents for the future.

Analyzing past and existing demographic, housing, economic and social trends permit the projection of likely conditions in the future. Projections and forecasts are useful tools in planning for the future; however, these tools are not always accurate and may change due to unforeseen factors. Also, past trends may be skewed or the data may be inaccurate, creating a distorted picture of past conditions. Therefore, it is important for Washington County to closely monitor population, housing and economic conditions that may impact the County.

The Plan is only one of several tools within the toolbox that helps guide the community into the future.

Through periodic monitoring, the County can adapt and adjust to changes at the local level. Having the ability to adapt to socio-economic change allows the County to maintain an effective Comprehensive Development Plan for the future, to enhance the quality of life, and to raise the standard of living for all residents.

Planned growth will make Washington County more effective in serving residents, more efficient in using resources, and able to meet the standard of living and quality of life every individual desires.

The Comprehensive Development Plan records where Washington County has been, where it is now,

Introduction

and where it likely will be in the future. Having this record in the Comprehensive Development Plan will serve to inform County officials as much as possible.

The Comprehensive Development Plan is an information and management tool for County leaders to use in their decision-making process when considering future developments. The Comprehensive Development Plan is not a static document; it should evolve as changes in the land-use, population or local economy occur during the planning period. This information is the basis for Washington County's evolution as it achieves its physical, social, and economic goals.

JURISDICTIONAL ORGANIZATION

The Washington County Board of Supervisors, which is a board of elected officials, performs the governmental functions for the County. Each incorporated community in Washington County also has elected officials and officers overseeing how their community is governed.

The planning and zoning jurisdiction of Washington County, pursuant to Neb. Rev. Stat. § 23-114 (Reissue 1997), includes all of the unincorporated portions of the County, excluding the established extraterritorial jurisdiction of each incorporated city or village.



2

Community Engagement



Community Engagement

COMMUNITY ENGAGEMENT

Community engagement is important to a successful planning effort. The use of public participation makes it possible to have a clearer understanding of how the residents feel regarding different parts of the community. However, there are limited numbers of individuals concerned about the effort either because of things are going in a good direction or specific issues do not impact them.

COMMUNITY ENGAGEMENT

Community engagement in Washington County was designed as a major component of the project and the process included multiple approaches. It was structured in a manner allowing for stakeholders to be involved in numerous ways throughout the process. Some key elements will include:

- Education: Planning 101
- Use of a steering committee
- SurveyMonkey
- Crowdsourcing Map
- Facebook
- Three Open Meetings
- Public hearings

Planning 101

Planning 101 forms the educational foundation for the entire project. In this process, there was one workshop. This workshop addressed:

- What is a Comprehensive Plan?
- How the plan is used?
- How does the plan impact me?

Steering Committee Meetings

With the assistance of Washington County, a steering committee was decided upon, the county Planning Commission, to provide regular input on all phases of the planning project. This group also provided the internal assistance the planning effort needed to get more people involved in the process.

The steering committee also acts as a sounding board during the entire process; this allows all pieces/Chapters of the plan to be reviewed and commented on at regularly scheduled meetings. The steering committee is one of the more critical components of the process.

SurveyMonkey

SurveyMonkey, a web based survey tool was utilized for gathering specific input on

Washington County. The survey process allows individuals to provide input while remaining totally anonymous. The survey was advertised using specially designed postcards, announcements on the project, Facebook page, and on posters hung up throughout the communities and county.

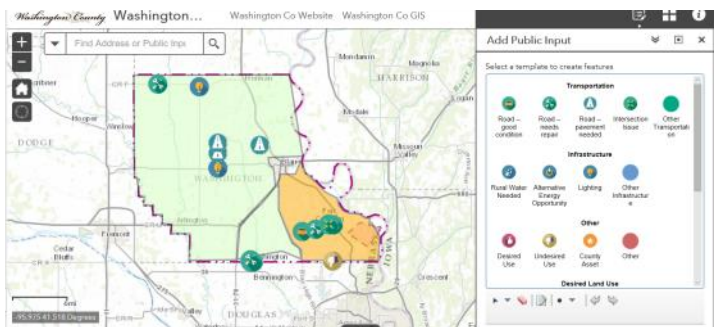
There were two different surveys individuals were asked to provide feedback: 1) General Washington County; and 2) Washington County Ag. The surveys examined different topic areas impacting Washington County. Receiving the most responses was the General Washington County survey. Overall, there were a total of 11 participants in the survey process.

Facebook

A special Facebook page was established for the Washington County Comprehensive Plan. The Facebook page served as a means to notify people about the survey as well as providing another medium for asking questions. In addition, the Facebook page provided a location to upload links to parts of the Comprehensive Plan as they were completed and reviewed.

Crowdsource Mapping

Crowdsource mapping is another digital tool utilizing a base map of Washington County and specifically designed icons. Visitors to the digital site were able to identify key issues by issue type and location on the map. The map site location was <https://washingtoncountycrowdsourcemap.wordpress.com/>



There were several visitors to the site and the comments focused on road improvements, preferred land use locations, and infrastructure/lighting needs. Visitors were also able to draw in larger areas and identify key land use desires; comments included protect agriculture and

residential development. These comments will be taken into account as the remainder of the plan is developed.

GOALS AND POLICIES

Planning for the future land uses of the community is an ongoing process of goal setting and problem solving aimed at encouraging and enhancing a better community with a better quality of life. Planning focuses upon ways of solving existing problems within the county, and providing a management tool enabling Washington County citizens to achieve their vision for the future.

Vision without action is merely a dream

Action without vision is just passing time

Vision with action can change the world

Joel Barker

Visioning is a process of evaluating present conditions, identifying problem areas, and bringing about consensus on how to overcome existing problems and manage change. By determining Washington County's vision, the county can decide where it wants to be in the future, and then develop a "roadmap" guiding decisions of the county. However, the plan cannot only be based upon this "vision" and "road map" concept. The residents of Washington County must also act or implement the necessary steps involved in achieving this "vision".

Change is continuous, therefore Washington County must decide specific criteria that will be used to judge and manage change. Instead of reacting to development pressures after the fact, the county along with their strategic vision, can better reinforce the desired changes, and discourage negative impacts that may undermine the vision. A shared vision allows Washington County to focus its diverse energies and minimize conflicts in the present, and in the future.

A key component of a Comprehensive Plan is the goals and policies. The issues and concerns of the citizens are developed into a vision. The vision statement can then be further delineated and translated into action statements and/or policies, used to guide, direct, and base decisions for future

growth, development and change within Washington County. Consensus on "what is good land use?" and "how to manage change in order to provide the greatest benefit to the community and its residents?" is formed. Washington County's goals and policies attempt to address various issues, regarding the questions of "how" to plan for the future.

Goals are desires, necessities and issues to be attained in the future. A goal should be established in a manner that allows it to be accomplished. Goals are the end-state of a desired outcome. Goals also play a factor in the establishment of policies within a county. In order to attain certain goals and/or policies within County government, they may need to be modified or changed from time to time.

Policies are measurable, definable steps that lead to the eventual completion of the goal. They are specific statements of principle or actions that imply a direction that needs to be undertaken.

The Washington County Comprehensive Plan provides a broadly painted picture for the county's future. The vision statements and goals describing the desired future conditions provide guidance for land use decisions and other actions, both public and private that collectively will determine the future of the County.

These policies will synthesize the information from the goals, as well as the responses from the participants of the various input processes. Policies play an important role in the Comprehensive Development Plan because they direct the different actions that will need to be taken to meet the goals.

It is important for counties to establish their goals and policies in a manner allowing for both long-term and short-term accomplishments. The short-term goals and policies serve several functions:

- Allow for immediate feedback and success, which fuels the desire to achieve additional goals and better policies.
- Allow for the distribution of resources over time thus assuring a balanced use of public investment.
- Establish certain policies that need to be followed before the long-term goals can be accomplished.

Community Engagement

WASHINGTON COUNTY VISION AND THE PLAN

The Washington County Comprehensive Plan provides a broadly painted picture for the county's future. The vision statements and goals describing the desired future conditions provide guidance for land use decisions and other actions, both public and private that collectively will determine the future of Washington County.

The core premise embedded in the Washington County Plan 2016 is designed to maintain and enhance the health, safety and welfare of the county during times of change, to promote our ideals and values as changes occur, and to meet the needs of today without sacrificing the ability of future generations to meet their needs. The plan acknowledges the importance of the connections between economic, environmental, and social components of the county. The plan is a combination of practicality and vision, and provides guidelines for sustaining the rich fabric of Washington County.

WASHINGTON COUNTY PLAN GOALS AND POLICIES

The goals and policies for the Washington County Comprehensive Plan will be contained throughout the following Chapters. Each Chapter shall contain the pertinent goals and policies for the Chapter.

Goals are intended as a long-range desire; however, as the Plan is implemented and different things in the world around Washington County changes, then the goals need to be modified to address the new direction and factors. Therefore, goals need to be flexible to ensure success and positive outcomes.



3

Population



Population

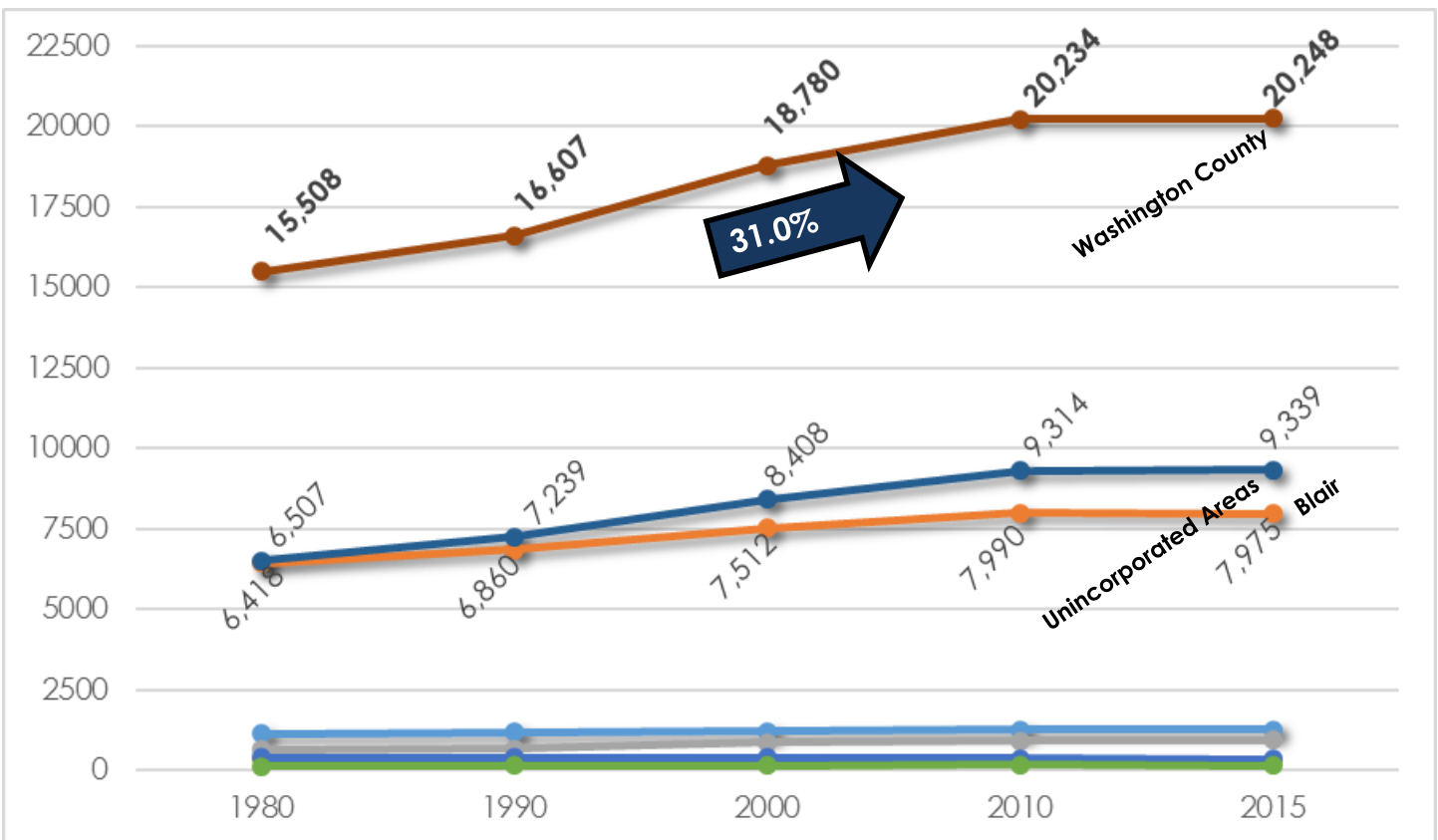
POPULATION PROFILE

Understanding past and existing populations; while applying these to the future is critical. Washington County, including the decision-makers, should understand where the County has been, where it is, and where it appears to be going. Population impacts all of the major components making up the County including housing, local employment, economics, and fiscal stability.

Developing an understanding of the historic population helps identify where the population is going in the future and aids in determining potential impacts on future housing, retail, medical, employment, and educational needs within Washington County.

Projections provide an estimate for the County to base future land use and development decisions. However, population projections are only estimates and unforeseen factors may affect projections significantly.

**FIGURE 3.1: POPULATION TRENDS AND ANALYSIS
WASHINGTON COUNTY 1980 TO 2015**



Source: U.S. Census Bureau 1980 - 1990, 2000, 2010

POPULATION TRENDS AND ANALYSIS

Figure 3.1 contains the historic population between 1980 and 2015 for Washington County, the incorporated communities within Washington County, and the unincorporated areas. The data provide a look at where Washington County has been and allows for the eventual projection of populations in the County.

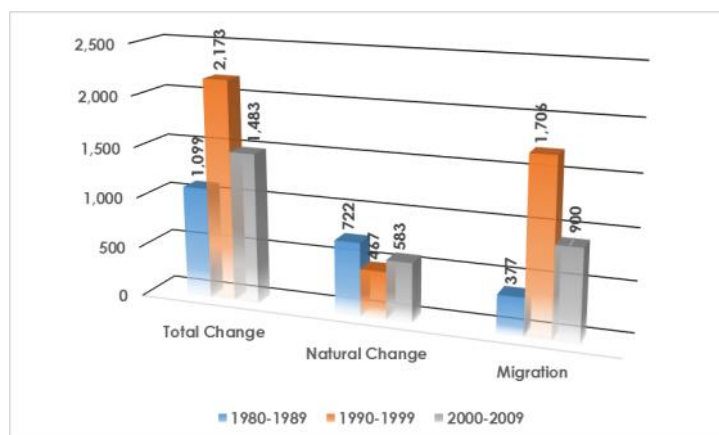
Typically, a mid-decade comprehensive plan update such as Washington County would include the most recent population projections. However, after examining the 2015 population estimates, it was determined nothing significant was occurring at either the County or municipal levels.

Overall, Washington County has seen a 30.6% (4,740 people) increase in population from 1980 to 2015. This increase was based upon overall increases in Arlington, Blair, Fort Calhoun, and Washington, as well as the unincorporated areas of Washington County. The unincorporated areas of Washington County grew by 43.5% (2,832 people) during this period.

MIGRATION ANALYSIS

Migration Analysis is a tool which allows the County to understand critical dynamics of the population shifts. Total Migration indicates the population size migrating in or out of the County over a given period of time.

**FIGURE 3.2: MIGRATION ANALYSIS
WASHINGTON COUNTY 1980 TO 2010**



Sources: U.S. Census Bureau 1980 – 2010
Nebraska DHHS, Vital Statistics Reports, 1980 – 2009

Figure 3.2 indicates overall population increase, countywide, as well as the two key components of population change, migration and natural change. Overall from 1980 to 2010, Washington County has increased by 4,755 people. This graphic indicates 62.7% of the population increase was due to people moving into Washington County; while the remaining 37.3% was due to more births than deaths in the residents of the county.

During the 30 year period births exceeded deaths by only 1,772 people. Each of the three decades recorded more births than deaths.

AGE STRUCTURE ANALYSIS

Age structure is an important component of population analysis. By analyzing age structure, one can determine other dynamics affecting the population of Washington County. Note: the data in Figure 3.2 is based on a calendar year and the data in Table 3.1 is as of April 1, 2000 and 2010; therefore the numbers may be slightly skewed.

Each age group affects the population in a number of different ways. For example, the existence of large younger age groups (20-44 years) means there is a greater ability to sustain future population growth

compared to large older age groups. Understanding what is happening within the age groups of the county's population is necessary to effectively plan for the future.

**TABLE 3.1: AGE AND SEX CHARACTERISTICS
WASHINGTON COUNTY 2000 TO 2010**

Age in 2000	Male and Female Populations			2000-2010	
	2000 population	Age in 2010	2010 population	Cohort Change	% Change
		0-4	1,195	1,195	
		5-9	1,387	1,387	
0-4	1,207	10-14	1,516	309	25.6%
5-9	1,423	15-19	1,594	171	12.0%
10-14	1,479	20-24	1,024	-455	-30.8%
15-19	1,581	25-29	973	-608	-38.5%
20-24	1,139	30-34	1,037	-102	-9.0%
25-29	937	35-39	1,191	254	27.1%
30-34	1,013	40-44	1,316	303	29.9%
35-44	3,057	45-54	3,399	342	11.2%
45-54	2,849	55-64	2,761	-88	-3.1%
55-64	1,670	65-74	1,509	-161	-9.6%
65-74	1,263	75-84	913	-350	-27.7%
75 & older	1,162	85 and over	419	-743	-63.9%
Total	18,780		20,234	1,454	7.7%

Source: U.S. Census Bureau 2000 and 2010

Table 3.1 contains the age group structure for Washington County in 2000 and 2010. The examination of population age structure allows for an understanding of where some of the population shifts are occurring. This data allows for a better understanding of what could occur in the future.

Reviewing population in this manner permits one to undertake a detailed analysis of which specific groups are moving in and out of the county. Negative changes in a group indicate out-migration or a combination of out-migration and deaths.

Washington County saw growth in seven age groups. The 0-4 and 5-9 groups are always an increase, since these individuals were not born when the 2000 Census was completed. Outside of the 2010 age groups of 0-4 and 5-9 years, the other increases were in the 10-14, 15-19, 35-39, 40-44, and 45-54 age groups. Overall, there was an increase of 3,961 persons in these age groups. When you eliminate the first two younger populations, there were 1,379 people that moved to Washington County during this period. This population increase consisted primarily of family aged adults and children.

Population

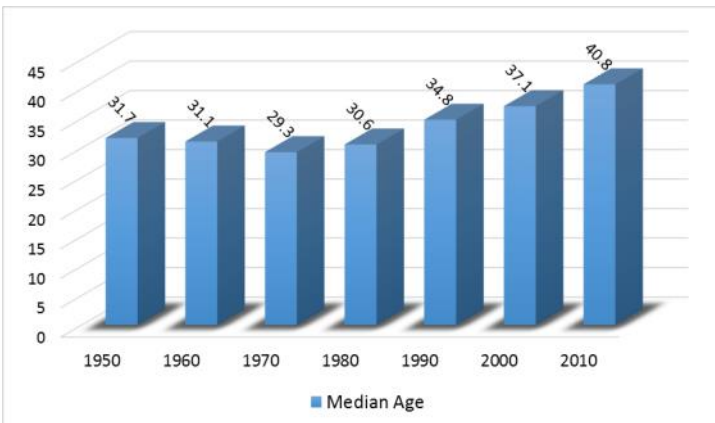
There were seven age groups from 2000 that declined by 2010. The group with the greatest loss was the 85 years+ (2010), which lost 743 persons over the period. This loss can be attributed to two causes: 1) people moving on after 75 years to other communities and senior care facilities, or 2) a dying population base. The latter is likely the largest reason since between 2000 and 2010 there were 1,617 resident deaths in Washington County. Overall, Washington County had a positive population pattern occur during the ten year period; including solid in-migration from family age groups and births.

MEDIAN AGE

Between 1950 and 2010, the median age in Washington County increased from 31.7 years to 40.8 years. This increase equaled 1.5 years per decade or of 28.7%. During this period, the county saw a dip in the median age; it dropped to a low of 29.3 years in 1970 and then began to climb to its current level.

Since the low point, the median age has increased by 11.3 years, 2.9 years per decade on average or 39.2% overall. Between 2000 and 2010, the median age increased from 37.1 years and 40.8 years or 10.0%.

**FIGURE 3.3: MEDIAN AGE
WASHINGTON COUNTY 1950 TO 2010**



Source: U.S. Census Bureau 1950-2010

DEPENDENCY RATIO

The dependency ratio examines the portion of Washington County supporting age groups historically dependent upon others for survival (those under 18 years and those 65 years and older). See the box above for details on calculating the ratio. The importance of this ratio focuses on number of dependent persons and is there enough employed

persons in the county to support these populations as well as themselves.

Dependency Ratio

The dependency ratio examines the portion of a community's earnings that is spent supporting age groups typically and historically dependent on the incomes of others.

< 1: 1 Independent resident is able to support more than 1 Dependent resident

=1: 1 Independent resident able to support 1 Dependent resident

>1: 1 Independent resident able to support less than 1 Dependent resident

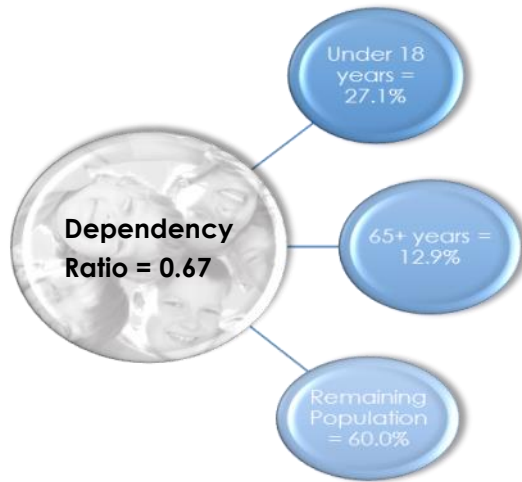
$$\frac{(\%18 \text{ years and younger} + \%65 \text{ years and older})}{\% \text{ of remaining population}}$$

Figures 3.4 and 3.5 indicate the dependency ratios for 2000 and 2010 in Washington County. The portion of persons less than 18 years of age decreased by 1.9% between 2000 and 2010; while those aged 65 years and older increased by 1.1% overall.

In 2000, Washington County had a Dependency Ratio of 0.67 (40.0%/60.0%); however, by 2010 the Ratio had decreased to 0.64 (39.2%/60.8%). This is supported by the slight decrease in the 18 and under age group, plus the slight increase in the 65 and older group.



**FIGURE 3.4: DEPENDENCY RATIO
WASHINGTON COUNTY 2000**



Source: U.S. Census Bureau 2000-2010

**FIGURE 3.5: DEPENDENCY RATIO
WASHINGTON COUNTY 2010**



Source: U.S. Census Bureau 2000-2010

ETHNICITY

Washington County during the past decade has seen a shift in the ethnicity within the County. Analysis of the ethnicity provides more detail as to the changes being seen in a county. Ethnicity is more than additional people living in the county since these new residents bring their own cultures and beliefs to the area; some of these may not mesh well with those already in place. The changes in Washington County saw considerable increases in all non-white ethnic groups between 2000 and 2010.

**TABLE 3.2: POPULATION BY ETHNICITY
WASHINGTON COUNTY 2000 TO 2010**

Race	2000		2010		2000-2010	
	Number	% of total	Number	% of total	Net Change	% change
White, not Hispanic	18,427	98.1	19,673	97.2	1,246	6.8
Black or African Am.	63	0.3	122	0.6	59	93.7
Am. Indian & AK. Native	38	0.2	44	0.2	6	15.8
Asian & Pacific Islander	71	0.4	62	0.3	-9	-12.7
Other, not Hispanic	57	0.3	136	0.7	79	138.6
Hispanic	202	1.1	419	2.1	217	107.4
Mexican	127	0.7	304	1.5	177	139.4
Puerto Rican	10	0.1	21	0.1	11	110.0
Cuban	10	0.1	3	0.0	-7	-70.0
Other Hispanic	55	0.3	91	0.4	36	65.5

Source: U.S. Census 2000 and 2010

The largest change was the Hispanic population, primarily Mexican and other Hispanics. The Hispanic population grew by 217 people between 2000 and 2010, the largest was those of Mexican ethnicity which accounted for 177 of the 217 people.

The second largest ethnic group was those classified as Other, not Hispanic. This classification saw 79 new people come to Washington County between 2000 and 2010. In Nebraska, in recent years, these typically are people from Sudan and Somalia. These two groups present new issues for counties and communities, especially for law enforcement since these two cultures have historically not got along.

In addition, the White population had a 6.8% increase overall, which equaled 1,246 more Caucasian people in the County. The County, communities, and school districts need to track these changes annually in order to minimize any potential fiscal impacts.

POPULATION PROJECTIONS

Population projections are estimates based upon past and present circumstances. The use of population projections allows Washington County to estimate the potential population in future years by looking at past trends. By scrutinizing population

Population

changes in this manner, the County will be able to develop a baseline of change from which future scenarios can be generated. A number of factors (demographics, economics, social, etc.) may affect projections positively or negatively.

At the present time, these projections are the best crystal ball Washington County has for predicting future population changes. There are many methods to project the future population trends; the two projection techniques used below are intended to give Washington County a broad overview of the possible population changes that could occur in the future.

TREND LINE ANALYSIS

Trend Line Analysis is a process of projecting future populations based upon changes during a specified period of time. In the analysis of Washington County, four different trend lines were reviewed: 2000 to 2010, 1980 to 2010, 1990 to 2010, and 1960 to 2010. A review of these trend lines indicates Washington County will see varied levels of population changes between now and 2040. The following projections summarize the decennial population for Washington County through 2040.

Washington County Trend Analysis

Year	1960 to 2010
2010	20,263 persons
2020	22,463 persons
2030	24,902 persons
2040	27,605 persons

Year	1980 to 2010
2010	20,263 persons
2020	22,152 persons
2030	24,218 persons
2040	26,476 persons

Year	1990 to 2010
2010	20,263 persons
2020	22,383 persons
2030	24,724 persons
2040	27,310 persons

Year	2000 to 2010
2010	20,263 persons
2020	21,863 persons
2030	23,590 persons
2040	25,452 persons

SUMMARY OF POPULATION PROJECTIONS

Using the modeling techniques discussed in the previous paragraphs, a summary of the population projections for Washington County through the year 2040 is shown in Figure 3.1. Three population projection scenarios were selected and include (1) a Low Series; (2) a Medium Series; and, (3) a High Series.

Low = 2000 to 2010

2020	21,863 persons
2030	23,590 persons
2040	25,452 persons

Medium = 1980 to 2010

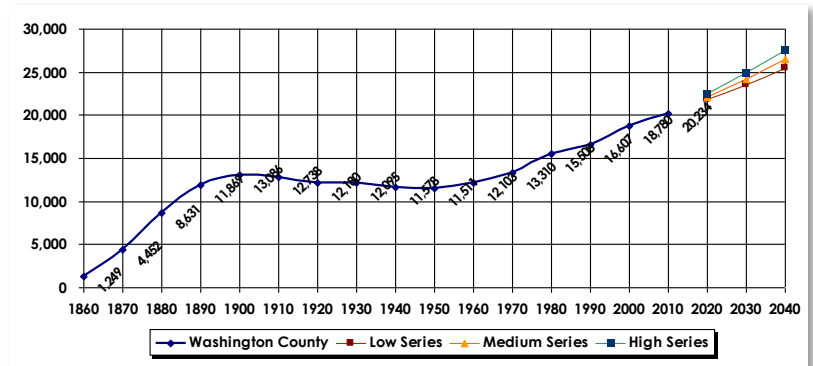
2020	22,152 persons
2030	24,218 persons
2040	26,476 persons

High = 1960 to 2010

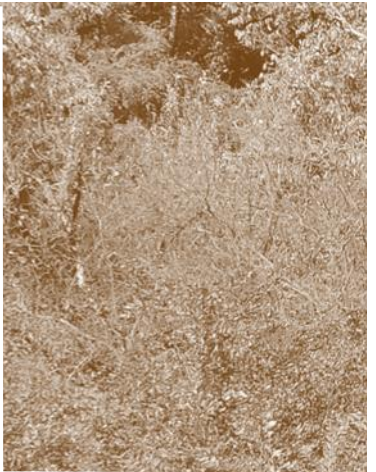
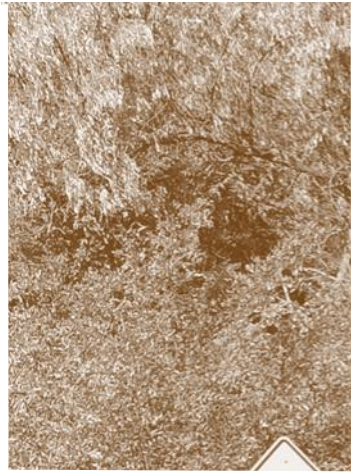
2020	22,463 persons
2030	24,902 persons
2040	27,605 persons

Figure 3.6 reviews the population history of Washington County between 1860 and 2010, and identifies the three population projection scenarios into the years 2020, 2030, and 2040. Figure 3.5 indicates the peak population for Washington County occurred in 2010.

**FIGURE 3.6: POPULATION AND PROJECTIONS
WASHINGTON COUNTY 1860 TO 2040**



Sources: U.S. Census Bureau, Marvin Planning Consultants



4

Housing



HOUSING PROFILE

The Housing Profile identifies existing housing characteristics and projected housing needs for residents of Washington County. The primary goal of the housing profile is to allow the County to examine past and present conditions; while, identifying potential needs including provisions for safe, decent, sanitary, and affordable housing for every family and individual residing within County.

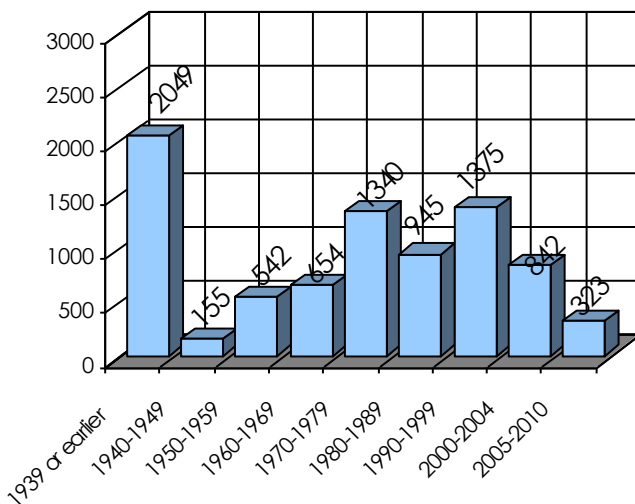
Projecting future housing needs requires several factors to be considered. These factors include population change, household income, employment rates, land use patterns, and residents' attitudes.

The following tables and figures provide the information to aid in determining future housing needs and develop policies designed to accomplish the housing goals for Washington County.

AGE OF EXISTING HOUSING STOCK

An analysis of the age of the housing stock can reveal a great deal about population and economic conditions of the past. Examining the housing stock is important in order to understand the overall quality of housing in Washington County.

FIGURE 4.1: AGE OF EXISTING HOUSING STOCK WASHINGTON COUNTY 2010



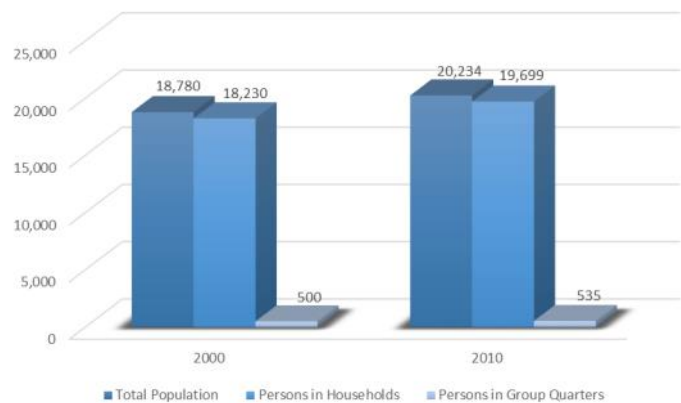
Sources: U.S. Census Bureau
American Community Survey 2010

Figure 4.1 indicates that 2,049 homes, or 24.9% of Washington County's 8,225 total housing units, were constructed prior to 1940. This statistic is county-wide, including each community, and will consist of older well-kept homes as well as homes likely in need of repair or demolition.

Washington County saw very positive construction activity between 1970 and 2010 with 4,825 (58.7%) homes constructed. This was especially true between 1990 and 2000 saw 1,375 (16.7%) new homes built during the decade. These data indicate the economy was relatively good during these decades. However, in recent years the construction of new homes has slowed.

A total of 57.6% of all housing units in Washington County were constructed prior to 1980. Due to the age of these homes, there may be a need for special weatherization programs in the County and communities to bring these homes up to current energy efficiency standards.

FIGURE 4.2: HOUSING POPULATIONS WASHINGTON COUNTY 2000 TO 2010



Sources: U.S. Census Bureau
American Community Survey 2010

HOUSING TRENDS

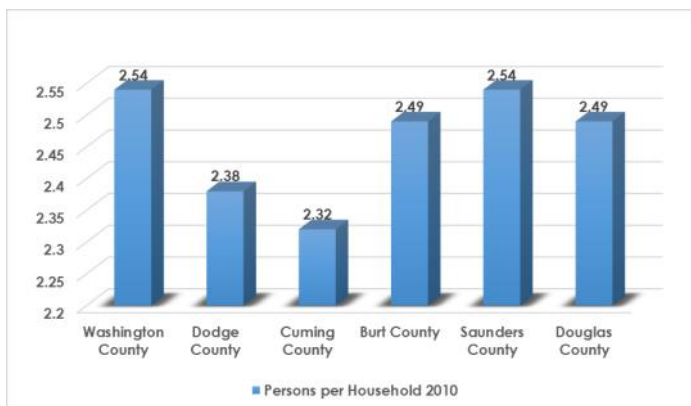
Figures 4.2 through 4.4 identify several different housing trends in Washington County. The figures indicate the breakdown between owner- and renter-occupied housing as well as the number of people living in group quarters.

Persons in Households/Group Quarters

In 2010 there were 1,469 more people living in households than in 2000, this represents a change of 8.1%. The increase in persons in households is slightly

higher than the actual population increase of 7.7% seen for the same period. Between 2000 and 2010, the number of people living in group quarters went from 500 people in 2000 to 535 in 2010, a change of 7.0%.

FIGURE 4.3: PERSONS PER HOUSEHOLD WASHINGTON COUNTY 2010



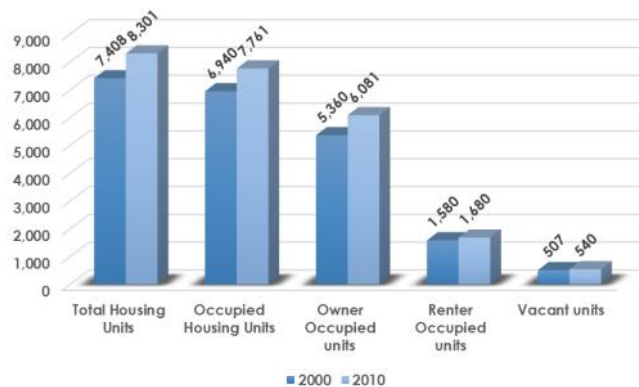
Sources: U.S. Census Bureau, American Community Survey 2010

Persons per Household

Figure 4.3 also includes the number of persons per household. The average persons per household in Washington County decreased from 2.63 to 2.54 persons between 2000 and 2010. The trend nationally has been towards a declining household size; however, the persons per household in Washington County is similar to the surrounding counties:

- Dodge County has 2.38 persons per household
- Cuming County has 2.32 persons per household
- Burt County has 2.49 persons per household
- Saunders County has 2.54 persons per household
- Douglas County has 2.49 persons per household

FIGURE 4.4: OCCUPIED VS. VACANT HOUSING WASHINGTON COUNTY 2000-2010



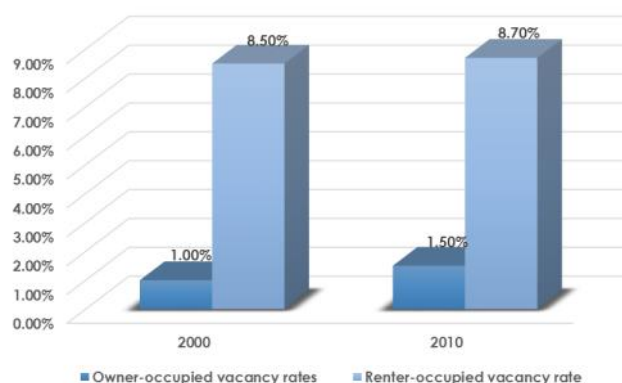
Sources: U.S. Census Bureau, American Community Survey 2000/2010

Occupied vs. Vacant Housing Units

Occupied housing units in the County increased by 11.8% between 2000 to 2010; this was a 821 unit increase over 2000.

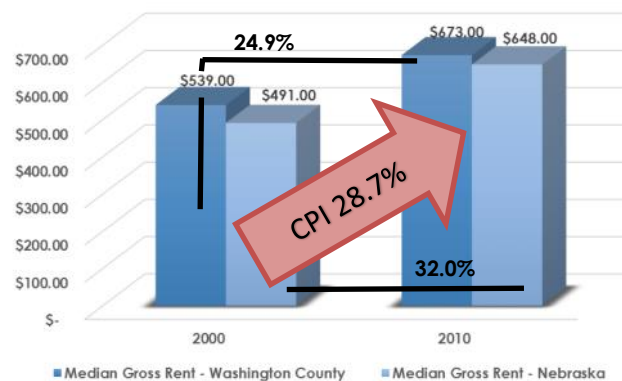
During the same time frame, vacant housing units grew from 507 units to 540 units or 6.5%. The largest increase in vacancy rates was in the renter-occupied units. The overall percentage for owner- and renter-occupied units in 2010 was at 1.5% and 8.7% respectively. Both showed increases over 2000.

FIGURE 4.5: VACANCY RATES BY TYPE OF UNIT WASHINGTON COUNTY 2000-2010



Sources: U.S. Census Bureau, American Community Survey

FIGURE 4.6: MEDIAN GROSS RENT WASHINGTON COUNTY AND NEBRASKA 2000-2010



Sources: U.S. Census Bureau, American Community Survey 2000/2010

Median Gross Rent

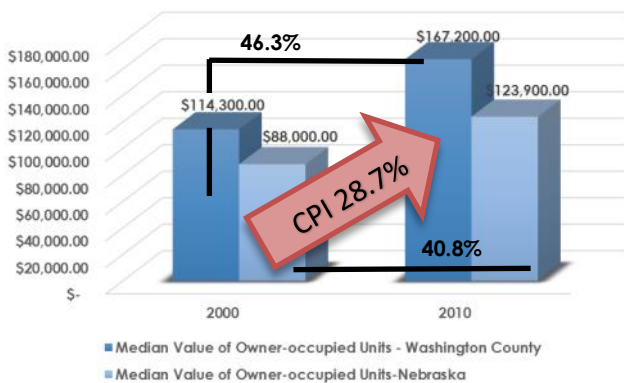
Median gross rent in Washington County increased from \$539 per month in 2000 to \$673 per month in 2010, or 24.9%. The State's median monthly gross rent increased by 32.0%. This indicates Washington County has seen a gross rent increase slightly slower than the

Housing

State. However, the County's median gross rent was 103.9% of the State's median gross rent in 2010.

Comparing changes in monthly rents between 2000 and 2010, with the Consumer Price Index (CPI), enables the local housing market to be compared to national economic conditions. Inflation between 2000 and 2010 increased at a rate of 28.7%, indicating Washington County's rents fell short of the rate of inflation for the 10-year period. Thus on average, Washington County tenants were paying less in monthly rents in 2010, in terms of real dollars, than they were in 2000. Landlords were also making less on their investment.

FIGURE 4.6: MEDIAN VALUE OWNER-OCCUPIED WASHINGTON COUNTY AND NEBRASKA 2000-2010



Sources: U.S. Census Bureau, American Community Survey 2000/2010

Median Value of Owner-Occupied Units

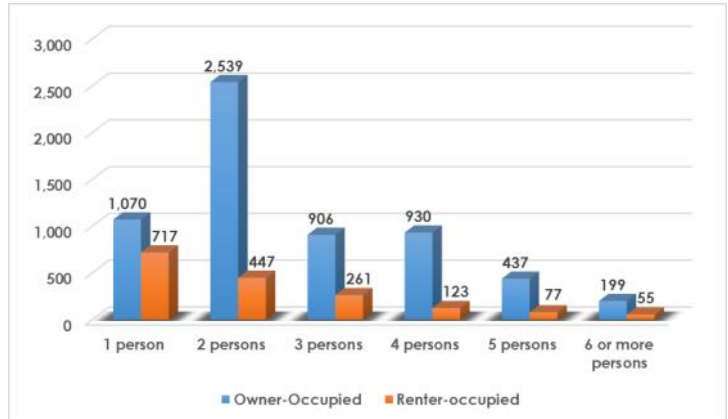
The Median value of owner-occupied housing units in Washington County increased from \$114,300 in 2000 to \$167,200 in 2010, and represents an increase of 46.3%. The median value for owner-occupied housing units in the State showed an increase of 40.8%. Housing values in Washington County grew at a considerably faster rate than seen statewide. In addition, the median value of an owner-occupied unit in Washington County is 135% of the state median.

In comparison to the CPI, the local value of owner-occupied housing increased at a rate greater than the CPI. This indicates housing values in the County were worth more in 2010 compared to 2000 dollars. In 2010, the median value of an owner-occupied dwelling was worth \$1.46 for every dollar in 2000.

HOUSEHOLD CHARACTERISTICS

Figure 4.7 and 4.8 show tenure (owner-occupied and renter-occupied) of households by number and age of persons in each housing unit. Analyzing these data gives Washington County the opportunity to determine where there may be a need for additional housing.

FIGURE 4.7: HOUSEHOLD CHARACTERISTICS-PERSONS WASHINGTON COUNTY 2010

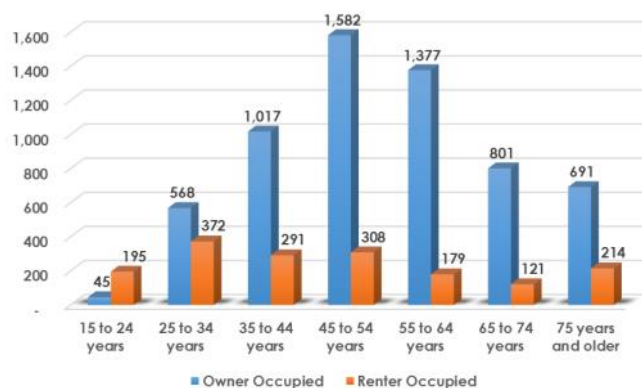


Sources: American Community Survey 2010

In 2010, the largest section of owner-occupied housing in Washington County was in the two-person household, with 2,539 units or 41.8% of the total owner-occupied units. By comparison, the largest household size for rentals was the single-person households with 717 renter-occupied housing units, or 42.7% of the total renter-occupied units.

In 2010, the age cohorts representing the largest home ownership group were those 45 to 54 years. Of the total residents living in owner-occupied housing units, 26.0% were between 45 and 54 years of age. The 55 to 64 years cohort was a close second with 22.6% of the total owner-occupied units.

**FIGURE 4.8: HOUSEHOLD CHARACTERISTICS-AGE
WASHINGTON COUNTY 2010**

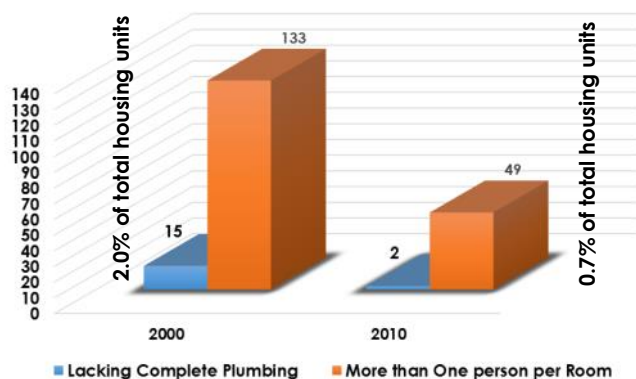


Sources: American Community Survey 2010

The renter-occupied housing was also dominated by the two different cohort groups; 45 to 54 years (18.3%) and 25 to 34 years (22.1%). These two cohorts represent 40.4% of all the renter-occupied units in 2010. The 45 to 54 years group is not a common occurrence for most Nebraska counties.

Washington County was comprised of 4,773 1- or 2-person households, or 62.3% of all households; which represents a considerable portion of the households. Countywide, households with 5- or more persons accounted for 768 units, or 9.9% of the total.

**FIGURE 4.9: SUBSTANDARD HOUSING CONDITIONS
WASHINGTON COUNTY 2000 TO 2010**



Sources: U.S. Census Bureau 2000, ACS 2010

Substandard Housing

According to the U.S. Department of Housing and Urban Development (HUD) guidelines, housing units lacking complete plumbing or that are overcrowded are considered substandard housing units. HUD defines a complete plumbing facility as hot and cold

-piped water, a bathtub or shower, and a flush toilet; overcrowding is more than one person per room. In addition, anytime there is more than 1.0 persons per room, the housing unit is considered overcrowded, thus substandard.

This criteria, when applied to Washington County, 148 units were substandard in 2000. This figure was reached by adding the number of housing units meeting one criterion to the number of housing units meeting the other criterion. However, the largest amount of substandard units was based on overcrowding with 133 units.

In 2010, the total number of substandard housing units decreased to 51 units. The primary contributing factor was still overcrowding, which accounted for nearly 96% of the substandard issue. The actual reported number decreased by 84 units from 2000 to 2010. Comparing Washington County to the State of Nebraska as a whole, the percent of substandard housing units in Washington County was slightly higher than the State for both time periods.

What these data fail to consider are housing units that have met both criterion and counted twice. Even so, the County should not assume this data overestimates the number of substandard housing. Housing units containing major defects requiring rehabilitation or upgrading to meet building, electrical, or plumbing codes should also be included in an analysis of substandard housing. A comprehensive survey of the entire housing stock should be completed every five years to determine and identify the housing units that would benefit from remodeling or rehabilitation work. This process will help ensure that a county maintains a high quality of life for its residents through protecting the quality and quantity of its housing stock.

HOUSING GOALS, OBJECTIVES AND POLICIES

Housing Goal 1

Provide quality housing throughout the county.

Housing Policies and Strategies

- H-1.1 The County should work with local agencies to assure quality housing is being constructed throughout the county.
- H-1.2 The County should continually work with each community as they strive to provide better housing within the corporate limits.

Housing

Housing Goal 2

Affordable housing should be available throughout the county.

Housing Policies and Strategies

- H-2.1 The County should work with agencies and funding sources like NIFA to offset development costs in order to bring the overall cost of housing down.
- H-2.2 The county should continue to focus on affirmatively furthering fair housing throughout the entire county area.
- H-2.3 The zoning and subdivision regulations should accommodate specific tools such as planned unit developments in order to aid in minimizing required improvements within developments.
- H-2.4 Support funding mechanisms available which effectively lower the cost of development and housing.
- H-2.5 The County should continually work with each community as they strive to provide better housing within the corporate limits.

Housing Goal 3

Washington County should recognize the balance between housing developments and agriculture and provide opportunities for both to prosper.

Housing Policies and Strategies

- H-3.1 Washington County should examine and identify areas of the county where housing densities are too high for agriculture to be effective.
- H-3.2 Areas within Washington County where housing densities are still low or considerably lower should be protected from future residential development in order to protect agricultural interests.
- H-3.3 Ultimately, all new housing should be encouraged to locate within the communities and their extraterritorial jurisdictions.



5

Economy and Economic Development



Economy and Economic Development

ECONOMIC AND EMPLOYMENT PROFILE

Economic data are collected in order to understand local changes in economic activity and employment needs and opportunities within Washington County. In this section, employment by industry, household income statistics, and commuter analyses were reviewed for Washington County and Nebraska.

Income Statistics

Income statistics for households are important for determining the earning power of households in a community. The data presented here show household income levels for Washington County in comparison to the state. These data were reviewed to determine whether households experienced income increases at a rate comparable to the state of Nebraska and the Consumer Price Index (CPI).

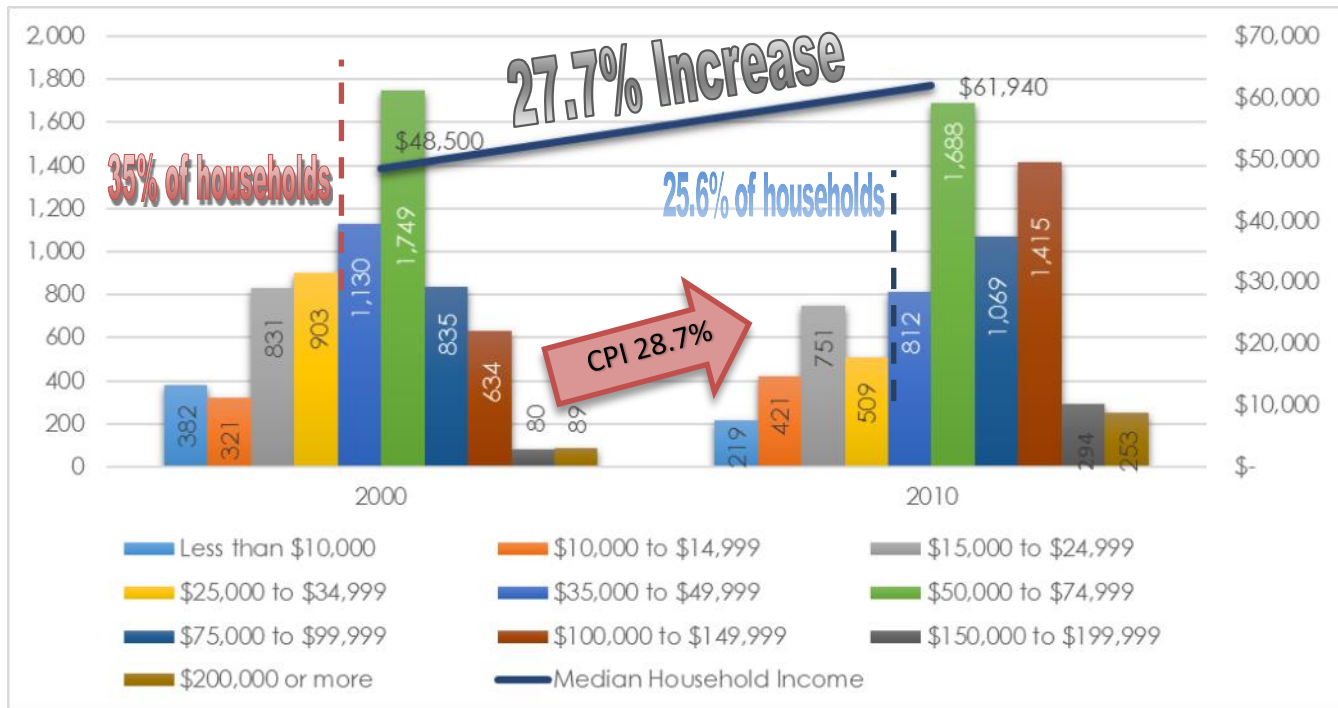
Figure 5.1 indicates the number of households in each income range for Washington County for 2000 and 2010. In 2000, the household income range most commonly reported was \$50,000 to \$74,999, which accounted for 25.2% of all households.

In 2010, the income range reported most was still the \$50,000 to \$74,999 which dropped to 22.7% of the total households.

Those households earning less than \$15,000 decreased from 10.1% in 2000 to 8.6% in 2010. These household groups account for the poorest of the poor in the community.

The median household income for Washington County was \$48,500 in 2000, which was \$9,000 more than the State median income of \$39,250. By 2010, the median household income increased to \$61,940 or an increase of 27.7%. The CPI for this period was 23.6%, which indicates household incomes in Washington County exceeded inflation. Therefore, households were actually earning more in real dollars in 2010 than in 2000. This difference basically indicates for every \$1.00 earned in a household during 2000, it was earning \$1.03 in 2010.

**FIGURE 5.1: HOUSEHOLD INCOME
WASHINGTON COUNTY 2000 TO 2010**

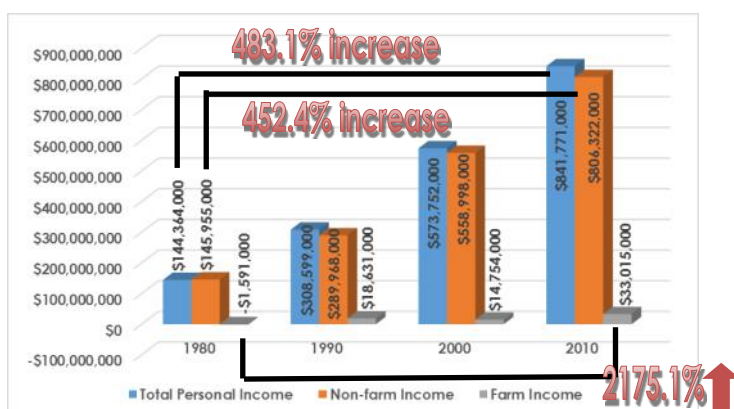


Source: U.S. Census Bureau, 2000, American Community Survey 2006-2010

Income Source and Public Assistance

The table below shows personal income by source for Washington County and the State. These data are compared to the CPI, in order to determine if increases are consistent with inflation and in terms of real dollars. Between 1980 and 2010, the CPI was 164.7%.

**FIGURE 5.2: INCOME BY SOURCE
WASHINGTON COUNTY 1980 TO 2010**

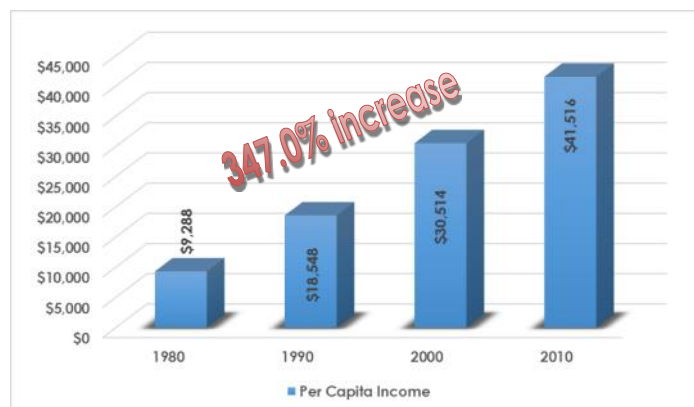


Source: BEA, Regional Economic Information System, 2016

Non-farm and Farm Income

Non-farm income increased from \$145,955,000 in 1980 to \$806,322,000 in 2010, or an increase of 452.4%, which was well over 2 ½ times the CPI. By 2010, farm income had risen from \$-1,591,000 to \$33,015,000, or 2175.1%, which is over 10 ½ times the CPI.

**FIGURE 5.3: PER CAPITA INCOME
WASHINGTON COUNTY 1980 TO 2010**



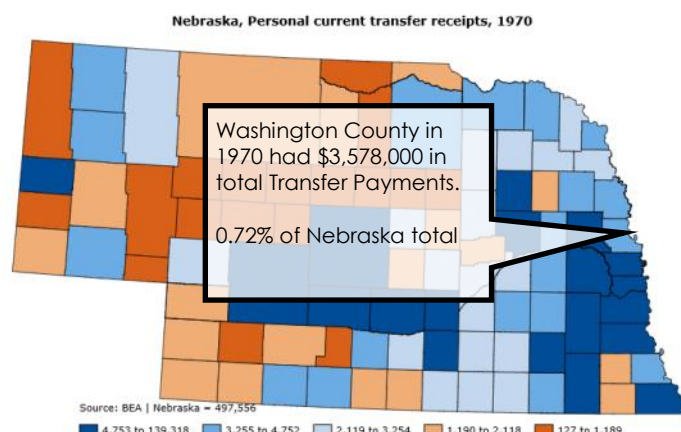
Source: BEA, Regional Economic Information System, 2016

Per Capita Income

The per capita income in Washington County increased from \$9,288 in 1980 to \$41,516 in 2010, or an increase of 347.0%, which was over twice the CPI. Washington County's per capita income was 104% of the state's per capita income level of \$40,023.

Another income source deserving examination is the amount of Transfer Payments to individuals in Washington County from 1970 to 2010, which is provided in Figure 5.4 and 5.5. Note the total amount of Transfer Payments equals Government Payments to Individuals plus Payments to Non-Profit Institutions plus Business Payments. The remaining categories listed in the table are subsets of the Government Payments to Individuals category.

**TABLE 5.4: TRANSFER PAYMENTS 1970
WASHINGTON COUNTY**



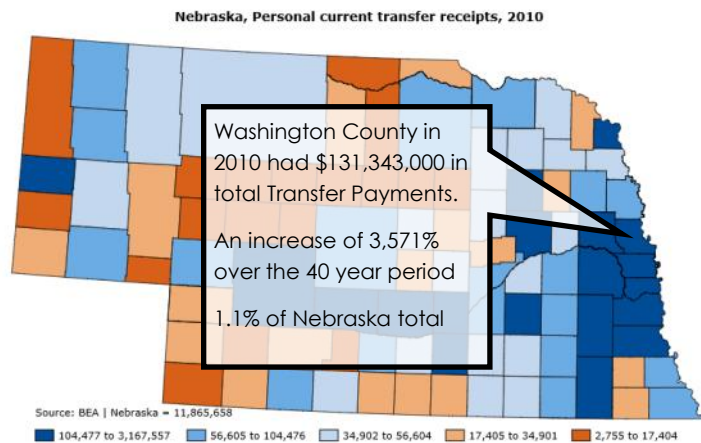
Source: Bureau of Economic Analysis, Regional Economic Information System, 2016

In 1970, Total Transfer Payments to Washington County added up to \$3,578,000. By 2010, Total Transfer Payments to Washington County were \$131,343,000, or an increase of 3,571%. Figure 5.6 shows in 2010, transfer payments per capita in Washington County were \$6,614.

The trend for transfer payments per capita between 1970 and 2010 indicates payments increased significantly to individuals in Washington County, increasing by over 2,134% in 40 years. However, transfer payments, as a proportion of per capita income, increased at a much lower rate between 1970 and 2010. In 1970, transfer payments comprised 7.7% of total per capita income, and in 2010, transfer payments were 15.9% of total per capita income, which is an annual increase of 2.7%.

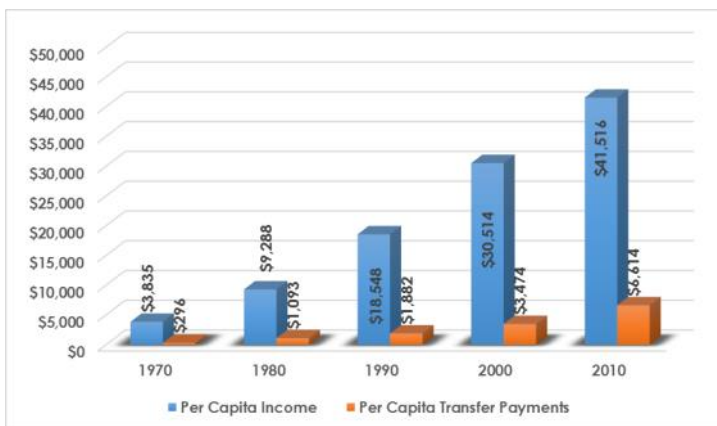
Economy and Economic Development

**TABLE 5.5: TRANSFER PAYMENTS 2010
WASHINGTON COUNTY**



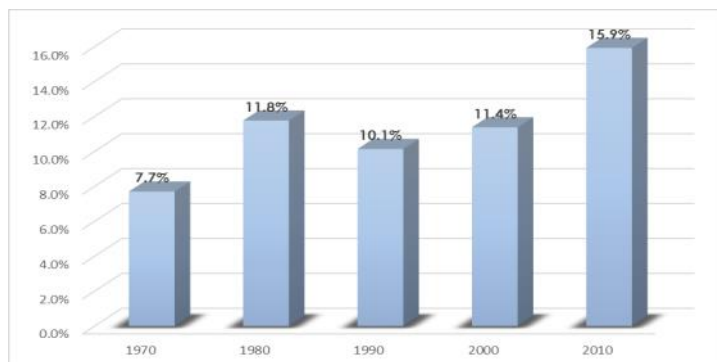
Source: Bureau of Economic Analysis, Regional Economic

**TABLE 5.6: TRANSFER PAYMENTS PER CAPITA
WASHINGTON COUNTY 1970 –2010**



Source: Bureau of Economic Analysis, Regional Economic

**TABLE 5.7: TRANSFER PAYMENTS PER CAPITA/PER
CAPITA INCOME 1970 –2010**



Source: Bureau of Economic Analysis, Regional Economic

Industry Employment

Analyzing employment by industry assists a community in determining the key components of their labor force. This section indicates the type of industries making up the local economy, as well as identifying particular occupations employing residents. Figures 5.7 indicates employment size by industry for Washington County for 2000 and 2010 (these data indicate the types of jobs residents have, not the number of jobs locally). However, Figure 5.8 takes the same data and indicates it by percentages.

The employment sector with the most employees in 2000 was Education, health, and social services. This sector employed 682 people or 21.7% of the total employed residents in 2000. In 2010, the largest employment sector was still Educational, health, and social services with 711 employees or 22.0% of the total. Washington County has seen major fluctuations during the time period in Figures 5.7 and 5.8.

Overall the top five industries in Washington County for 2000 were as follows:

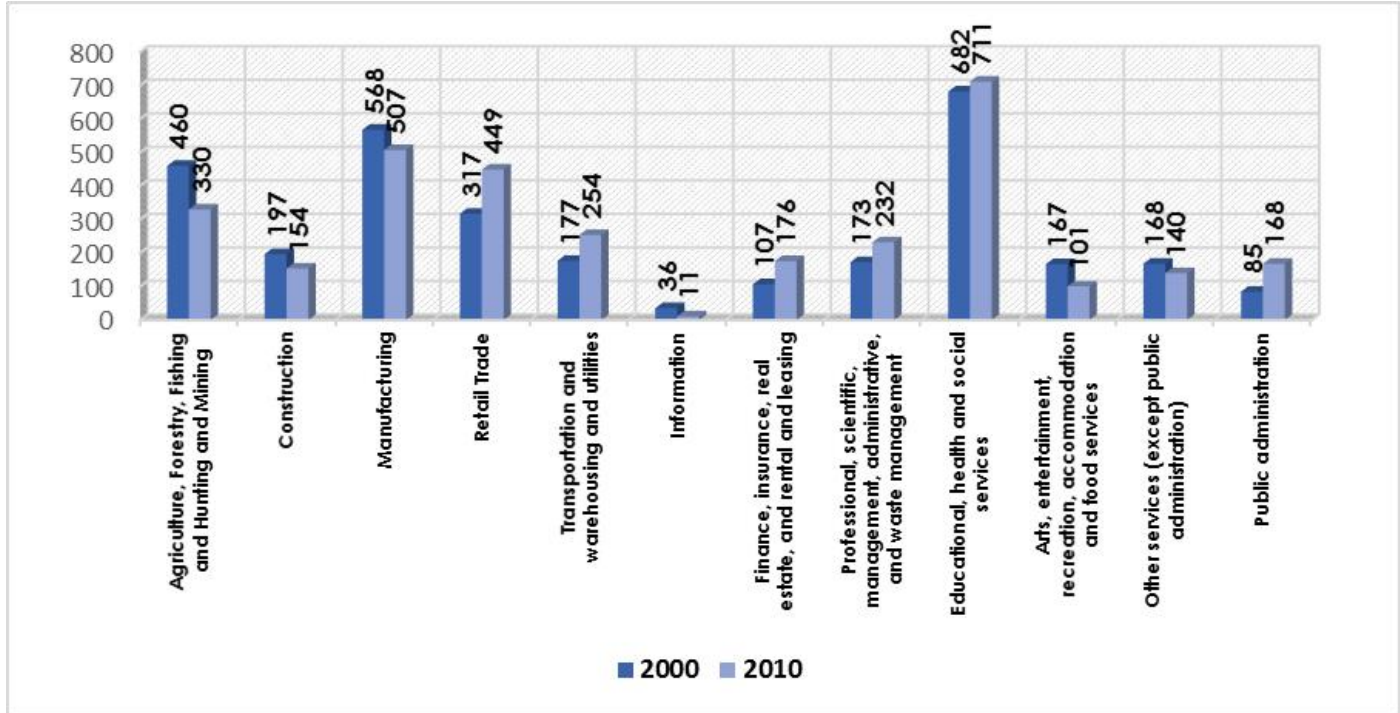
- Educational, health, and social services 21.7%
- Manufacturing 18.1%
- Ag./forestry/Fishing/and Hunting and Mining 14.7%
- Retail trade 10.1%
- Construction 6.3%

By 2010, the overall top five industries in Washington County were as follows:

- Educational, health, and social services 22.0%
- Manufacturing 15.7%
- Retail trade 13.9%
- Ag./forestry/Fishing/and Hunting and Mining 10.2%
- Transportation and warehousing and utilities 7.9%

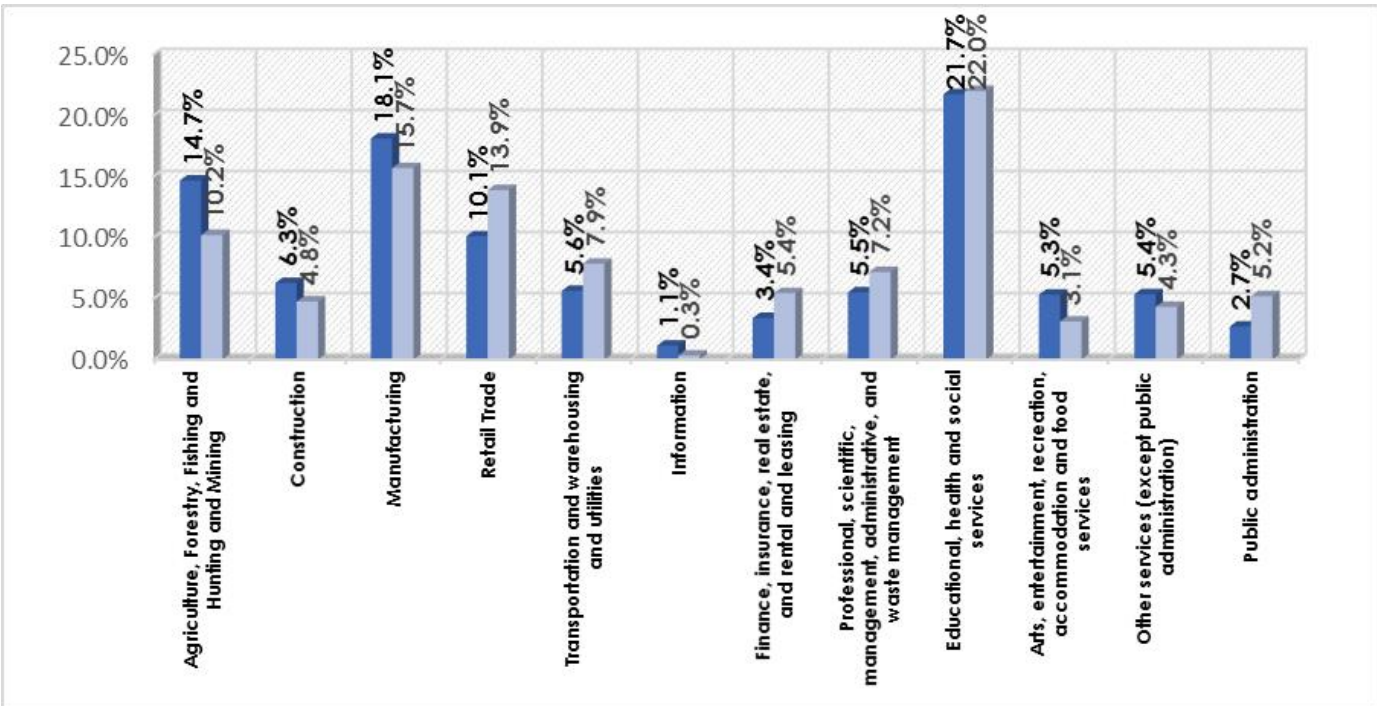


**FIGURE 5.8: EMPLOYMENT BY INDUSTRY (NUMBERS)
2000 AND 2010**



Source: U.S. Census Bureau 2000, American Community Survey 2005-2009

**FIGURE 5.9: EMPLOYMENT BY INDUSTRY- % OF TOTAL
2000 AND 2010**



Source: U.S. Census Bureau 2000, American Community Survey 2005-2009

Economy and Economic Development

Employment in the top five industries for both 2000 and 2010 are relatively balanced. By 2010, the actual gap in the percent of the total actually became greater than in 2000.

Regional Basic/Non-Basic Analysis

The following data examine five occupational areas established by the U.S. Census Bureau to evaluate trends in employment and the area economy. Basic employment and non-basic employment are defined as follows:

Basic employment is business activity providing services primarily outside the area through the sale of goods and services, the revenues of which are directed to the local area in the form of wages and payments to local suppliers.

Non-Basic employment is business activity providing services primarily within the local area through the sale of goods and services, and the revenues of such sales re-circulate within the community in the form of wages and expenditures by local citizens.

In order to establish a number of Basic jobs, a comparative segment or entity must be selected. For purposes of this analysis, the state of Nebraska will be used. This allows the analysis to establish where Washington County is seeing exports from the state as a whole.

This analysis is used to further understand which occupational areas are exporting goods and services outside the area, thus importing dollars into the local economy. The five occupational categories used in the analysis are listed below:

- Managerial business, science, and arts occupations
- Service occupations
- Sales and office occupations
- Natural Resources, construction and maintenance occupations
- Production, transportation and material moving occupations

A related concept to the basic/non-basic distinction is that of a Base Multiplier. The base multiplier is a number, which represents how many non-basic jobs are supported by each basic job. A high base multiplier means that the loss of one basic job will have a large potential impact on the local economy if changes in employment occur. The rationale behind this analysis is that if basic jobs bring new money into a local economy, that money becomes the wages for workers in that economy. Therefore, more money brought in by basic jobs creates more non-basic jobs that are supported.

Basic Employment

The occupation categories are compared to the same categories for the state and where Washington County's percentage exceeds the state's percentage there is Basic employment. Table 5.1 indicates there are two categories that have Basic employment with the largest being Management, business, science, and arts occupations.

TABLE 5.1: BASIC/NON-BASIC BY OCCUPATIONS - 2010

Location	Management business, science, and arts occupations	Service occupations	Sales and office occupations	Natural Resources, construction and maintenance occupations	Production, transportation, and material moving occupations	Base Multiplier
Washington County	39.1%	14.9%	22.2%	11.3%	12.5%	17.2
Douglas County	38.5%	16.2%	27.2%	7.5%	10.6%	16.0
Burt County	33.4%	18.3%	22.4%	13.8%	12.1%	16.2
Dodge County	25.2%	16.2%	26.4%	11.8%	20.5%	9.2
Lancaster County	38.6%	16.4%	25.5%	8.2%	11.4%	20.3
Nebraska	34.8%	16.2%	25.0%	10.1%	13.8%	NA

Source: American Community Survey 2006-2010

This is not unexpected considering Washington County and the different industries based in and south of Blair. The other category that contains Basic Employment is:

- Natural resources, construction and maintenance occupations

Overall, 5.5% of the employment base in Washington County is tied to the exportation of goods or services. The County needs to continually work on their Business Retention and Expansion process in order to make these employers stay in Washington County.

Base Multiplier

The information in Table 5.1 shows Washington County has a base multiplier of 17.2, which means that for every job that falls into the basic category, 16.2 other jobs in the county are supported and/or impacted. This is illustrated by comparing the basic and non-basic percentages against each other.

This indicates for every job tied to exportation of goods or services, there are 16.2 jobs created/supported by the dollars coming into the community. Therefore, if Washington County lost just one of the jobs tied to exports then there is the potential to lose approximately 16.2 jobs from the non-basic employment side.

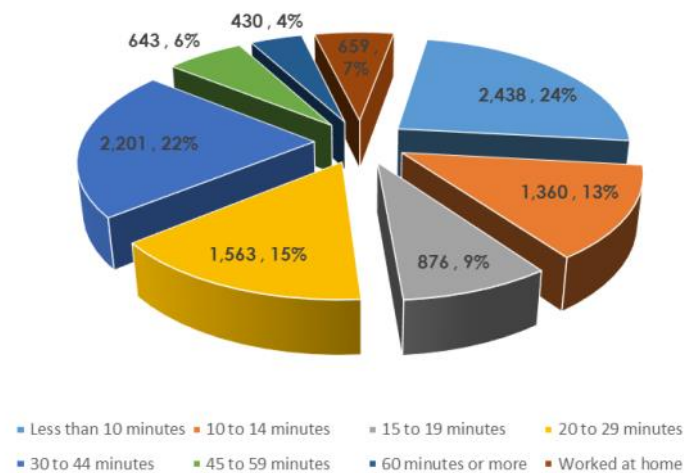
There is no magical multiplier a county can aim to achieve. Every county is different and the dynamics involved are different. The unique and ever changing dynamics are what make a particular county unique and attractive to different employers. It is critical for a county to determine their future vision for business and industry and work towards that end. As previously mentioned it is also critical to diligently work towards a successful Business Retention and Expansion program to support those employers already located in the county. Some counties become too focused on attracting that next big catch and forget about the opportunities existing employers can offer through expansion of their operations.

COMMUTER TRENDS

Figure 5.10 show the commuter characteristics for Washington County in 2010. Travel time to work is another factor that can be used to gauge where Washington County's workforce is employed. Figure 5.10 shows how many residents of Washington County travel to work in each of several time categories.

Figure 5.10 indicates, in 2010, 24.0% of the commuters were traveling 10 minutes or less to work. In addition, 659 people or 7% work from home. Those traveling 20 minutes or more to work totaled 4,837 people or 47% of those driving to work.

FIGURE 5.10: TRAVEL TIME TO WORK - 2010



Source: American Community Survey 2005-2010

AGRICULTURAL PROFILE

Table 5.2 identifies key components affecting Washington County's agricultural profile. This Table examines the number of farms, size of these farms, cropland data, and certain value criteria for these farms. The data are for 1997 through 2012.

Number of Farms

The table indicates the number of farms within Washington County actually increased between 1997 and 2012, which has not been the norm across Nebraska. The total number of farms increased from 692 in 1997 to 821 in 2012, an increase of 18.6%.



Economy and Economic Development

**TABLE 5.2: AGRICULTURAL PROFILE
WASHINGTON COUNTY 1997 TO 2012**

Agricultural Characteristics	1997	2002	2007	2012	% Change 1997-2012
Number of Farms	692	760	762	821	18.6%
Land in Farms (acres)	219,165	242,419	217,306	248,088	13.2%
Average size of farms (acres)	317	319	285	869	174.1%
Total area for Washington County	396,224	396,224	396,224	396,224	0.0%
Percentage of land in farms	55.3%	61.2%	54.8%	62.6%	13.2%
Total cropland (acres)	195,823	211,493	188,129	209,813	7.1%
Harvested cropland (acres)	176,832	194,705	179,273	204,638	15.7%
Estimated Market Value of Land & Bldg (avg./farm)	\$634,879	\$726,531	\$875,349	\$1,820,339	186.7%
Estimated Market Value of Land & Bldg (avg./acre)	\$2,083	\$2,252	\$3,069	\$6,024	189.2%

Source: U.S. Census of Agriculture, 1992, 1997, 2002, 2007

Land in Farms/Average size of Farms/Cropland

Table 5.2 also shows the total land in farms within Washington County. From 1997 to 2012, Washington County actually had an increase in the total land considered to be in farms. The overall increase was 13.2% or an approximate increase of 30,000 acres. The total land in farms accounts for 62.6% of the total acres in Washington County, which is an increase from 55.3% in 1997. This specific increase seems to indicate a potential change in the definition of farm land by the USDA, considering the geography and topography of Washington County.

The average size of each farm increased from 317 acres in 1997 to 869 in 2012. This trend has been the norm across Nebraska and the United States for the last several decades. The overall increase was 174.1%.

The total cropland in Washington County increased from 195,823 acres in 1997 to 209,813 acres in 2012. A key to these data compared to total farm land is that in 1997 89.3% of the Land in Farms was considered cropland. By 2012 the percent of cropland to Total Land in Farm dropped to 84.6%.

The next term/data to review is harvested cropland. Harvested cropland is as it sounds cropland actually harvested and yielded a crop. In 1997 the Harvested Cropland in Washington County was 176,832 (90.3% of Total Cropland and only 80.7% of the Total Land in Farms). By 2012 the Harvested Cropland increased to 204,638 acres (97.5% of Total Cropland and only

82.5% of the Total Land in Farms).

Estimated Market Value

Table 5.2 also shows the Estimated Market Values of Land and Buildings, both by average per farm and average per acre. In 1997 the average value per farm acre was \$2,083. The average value increased in every Census of Agriculture until it reached an average per acre of \$6,024 in 2012; an increase of 189.2%. The CPI for this same period was approximately 45%; therefore the average value per acre increased at nearly four times the rate of inflation in Washington County.

The increase in the average per acre also translates into an increase in the average per farm. The average value per farm in 1997 was \$634,879 and increased to \$1,820,339 in 2012, an overall increase of 186.7%. Again, this increase exceeded the CPI and the rate of inflation for the period. The average per farm, statewide, was \$550,705 in 1997 and \$2,159,268 in 2012, an increase of 292.1%. Therefore, the average farm value in Washington County is less than the state average and the value has been growing at a slower rate than the state.

**TABLE 5.3: NUMBER OF FARMS BY SIZE
WASHINGTON COUNTY 1992 TO 2007**

Farm Size (acres)	1997	2002	2007	2012	% Change 1997-2012
1 to 9	43	44	71	85	97.7%
10 to 49	134	192	232	243	81.3%
50 to 179	190	185	175	158	-16.8%
180 to 499	181	168	138	159	-12.2%
500 to 999	96	115	93	116	20.8%
1,000 or more	48	56	53	60	25.0%
Total	692	760	762	821	18.6%

Source: U.S. Census of Agriculture, 1992, 1997, 2002, 2007

Table 5.3 indicates the number of farms by size from 1997 to 2012. The category with the greatest increases were in the farms averaging one to nine acres, increasing by 42 farms or 97.7%. However, the farms with 500 or more acres had a solid increase from 1997 to 2012 by adding a total 22 farms or a 22.2% increase.

**TABLE 5.4: NUMBER FARMS AND LIVESTOCK BY TYPE
WASHINGTON COUNTY 1992 TO 2007**

Type of Livestock	1997	2002	2007	2012	% Change 1997 to 2012
Cattle and Calves					
farms	262	237	177	230	-12.2%
animals	33,183	32,454	30,175	28,195	-15.0%
average per farm	127	137	170	123	-3.2%
Beef Cows					
farms	187	177	150	153	-18.2%
animals	5,010	5,532	4,523	5,392	7.6%
average per farm	27	31	30	35	31.5%
Milk cows					
farms	22	12	9	11	-50.0%
animals	1,559	1,529	1,224	1,013	-35.0%
average per farm	71	127	136	92	30.0%
Hogs and Pigs					
farms	107	65	43	24	-77.6%
animals	56,935	102,628	40,935	57,856	1.6%
average per farm	532	1,579	952	2,411	353.0%
Sheep and lambs					
farms	31	26	23	31	0.0%
animals	1,889	2,048	986	1,122	-40.6%
average per farm	61	79	43	36	-40.6%
Chickens (layers and pullets)					
farms	27	23	37	53	96.3%
animals	742	466	903	1,215	63.7%
average per farm	27	20	24	23	-16.6%

Source: U.S. Census of Agriculture, 1997, 2002, 2007, 2012

Table 5.4 indicates the number of farms and livestock by type for Washington County between 1997 and 2012. The predominant livestock raised in Washington County are hogs and pigs. Hogs and pigs are followed closely by cattle and calves. Both types of livestock production saw decreases in the total operations in place; however, hogs and pigs showed an overall increase in the number of animals and animals per farm.

All livestock production, except for hogs and pigs, sheep and lambs as well as chickens, showed a decline in the number of farms raising animals. Three livestock categories actually indicated increases in total animals from 1997 to 2012; which were beef cows, hogs and pigs, and chickens.

**TABLE 5.5: NUMBER OF FARMS AND CROPS BY TYPE
WASHINGTON COUNTY 1997 TO 2012**

Type of Crop	1997	2002	2007	2012	% Change 1997 to 2012
Corn for Grain					
farms	454	410	345	384	-15.4%
acres	81,311	87,038	84,075	96,416	18.6%
average per farm	179	212	244	251	40.2%
Corn for Silage					
farms	40	37	18	31	-22.5%
acres	1,575	1,736	1,045	1,878	19.2%
average per farm	39	47	58	61	53.9%
Sorghum					
farms	5	1	-	-	-
acres	421	(D)	-	-	-
average per farm	84	-	-	-	-
Wheat					
farms	24	8	13	7	-70.8%
acres	461	379	(D)	276	-40.1%
average per farm	19	47	-	39	105.3%
Oats					
farms	35	17	15	4	-
acres	822	479	374	99	-
average per farm	23	28	25	25	-
Soybeans					
farms	435	407	357	389	-10.6%
acres	78,599	87,154	77,867	91,769	16.8%
average per farm	181	214	218	236	30.6%

Source: U.S. Census of Agriculture, 1997, 2002, 2007, 2012

Table 5.5 indicates the number of farms and crop by type for the period from 1997 to 2012. The table shows the prominent crops grown in the county. In addition, the table indicates the total number of farms producing the specific crop and finally an average per farm.

Corn and soybeans have been the two most frequently raised crops in Washington County since 1997. Three of the six categories showed an increase

Economy and Economic Development

in acres farmed; these include Corn for grain, Corn for silage, and Soybeans. The crop with the largest percentage increase (acres) is Corn for Silage at 19.2%, while Corn for grain increased by 18.6%. In 2012, the total acres harvested of corn for grain was 96,416 which accounted for 47.1% of all harvested cropland. Soybeans accounted for 91,769 acres of cropland in Washington County during 2012, accounting for 44.8% of all harvested cropland.

Agriculture has historically been a major part of the Washington County economy. It appears that its importance will only grow during the planning period of this document. It will be critical to maintain a balance in the type of livestock and grains raised in order to minimize future economic downturns.

ECONOMIC DEVELOPMENT

Economic development in counties similar to Washington County is likely the most difficult of all entities. The primary reason for this difficulty is due to the fact counties similar to Washington County are still strongly agricultural and are being influenced greatly by a larger community, Omaha. The County needs to define what economic development means to them.

Interestingly, the new residential developments seen in Washington County are accommodating new residents, most of which are likely relocating from the Omaha boundaries for a slice of nature. However, nearly all of these new residents are still driving to Omaha for employment and to spend their wages. The biggest contribution this economic generator brings is an increased property tax base.

Looking at the older process of agriculture, it can be seen that these operations are still living in Washington County, in some cases they are also building new homes. However, the crops and livestock raised by this segment is actually importing new money from outside Washington County into the local economy. These funds are typically seen as basic economies which in turn support local individuals as the money roles over.

Considering both of these factors are at work in Washington County, the County must find a means to allow these to coexist during this planning period. The Land Use Chapter of this Plan and its Goals and Strategies are critical to this balancing act.

ECONOMIC DEVELOPMENT GOALS AND POLICIES

Economic Development Goal 1

Promote Washington County on a full-time basis

Economic Development Policies and Strategies

- ED-1.1 The county needs to continue supporting Gateway Development Corporation in Blair with promoting Washington County.
- ED-1.2 The county should recognize the fact economic development success in Blair, Arlington, Fort Calhoun, etc. means complete success for the county as a whole.

Economic Development Goal 2

Promote a balanced economic development program striving to add value to the agricultural base of the county.

Economic Development Policies and Strategies

- ED-2.1 Agriculture and agricultural employment, including value-added agricultural businesses, should be promoted throughout Washington County.
- ED-2.2 Washington County should encourage economic development projects, which do not conflict with the agricultural character of the County.
- ED-2.3 Work with businesses and agricultural operators to build new vertically integrated economic systems from the current agricultural uses in place.
- ED-2.4 Work to establish new or existing public and/or private research facilities in Washington County.

Economic Development Goal 3

Recruit or retain the youth of the county during or after college.

Economic Development Policies and Strategies

- ED-3.1 Develop programs and jobs to address the needs of the youth in order to attract them back to the area after completion of their post-secondary education.
- ED-3.2 The youth of Washington County should be involved in the identification and development of these projects.
- ED-3.3 The county should also attract the youth back to the county currently living in Omaha, Lincoln and elsewhere.

Economic Development Goal 4

Examine the potential and promote Washington County as a great place to work and telecommute.

Economic Development Policies and Strategies

- ED-4.1 Develop a promotional campaign to promote the quality of life issues of Washington County as a place to live and "Work from".
- ED-4.2 Economic Development activities should focus on growing local businesses, established by county residents, as opposed to pursuing the ultimate "smokestack(s). Homegrown businesses and industries will contribute more to the local communities and county and will be a part of the community.
- ED-4.3 Identify businesses and professions where telecommuting would be appropriate and functional.

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6

Washington County Facilities



County Facilities

COUNTY FACILITIES

State and local governments provide a number of services to their citizens and are referred to as public facilities. Public facilities represent a wide range of buildings and services built and maintained by the different levels of government. Such facilities are provided to insure the safety, wellbeing and enjoyment of the residents of Washington County. These facilities and services provide residents with social, cultural, educational, and recreational opportunities, as well as law enforcement and fire protection services designed to meet area needs.

It is important for all levels of government to anticipate the future demand for their services if they are to remain strong and vital. The analysis of existing facilities and future services are contained in the Facilities Chapter. Alternatively, in some instances, there are a number of services not provided by the local or state governmental body and are provided by non-governmental private or non-profit organizations for the community as a whole. These organizations are important providers of services and are in integral part of the community.

County Facilities Plan

The Facilities Plan component of a Comprehensive Development Plan reviews present capacities of all public and private facilities and services.

The Facilities Plan for Washington County is divided into the following categories:

- Recreation
- County Buildings
- Historic Sites and Places
- Education
- Fire/Law Enforcement
- Communication
- Health Care

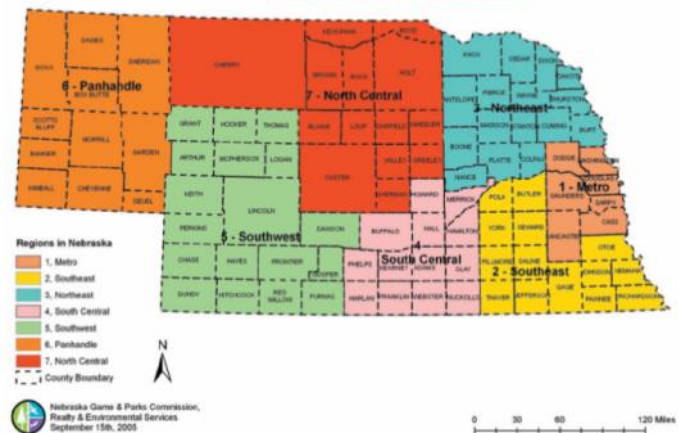
Recreation

Washington County is located in Nebraska's Southeast Recreation Planning, Region 1, and a region within the Nebraska Department of Game and Parks system. The Region includes seven counties in Eastern Nebraska.

COMMUNITY PARKS AND FACILITIES

The following facilities and programs can be found in the identified communities of Washington County.

FIGURE 6.1: NEBRASKA GAME AND PARKS REGIONS



Blair Parks

Blair has nine city park facilities throughout the community. The primary parks and recreation facilities include:

- Black Elk-Neihardt Park
- Lions Park
- Mini Park
- Optimist Park
- Rhoades Park
- Stemmermann Park
- Steyer Park
- Veteran's Tribute Plaza
- Hardy RV Park

Overall, the city of Blair has more than 150 acres of city owned and operated parks.



Photo 6.1 Black Elk-Neihardt Park in Blair
Source: Google Earth

Arlington Parks

Arlington has three city park facilities throughout the community. The primary parks and recreation facilities include:

- Village Park
- Arlington Veterans Park
- Bell Creek Park/Two Rivers Sports Complex



Photo 6.2 View of Bell Creek Park in Arlington
Source: City of Arlington website

Fort Calhoun Parks

Arlington has five city park facilities throughout the community. The primary parks and recreation facilities include:

- Baseball and softball complex
- Community building field
- West Market Square Park
- Pioneer Park
- Elementary School Park

Herman Park

The park in Herman is primarily a ballfield with some ancillary items

Washington Park

The Village of Washington has one smaller park located in the center of the community. The park consists of basic swings and playground equipment.

REGIONAL RECREATION

Regional recreational areas are a combination of state, federal, and major private facilities that attract people into the Washington County area.



Photo 6.3 Ballfields in Fort Calhoun
Source: Fort Calhoun website

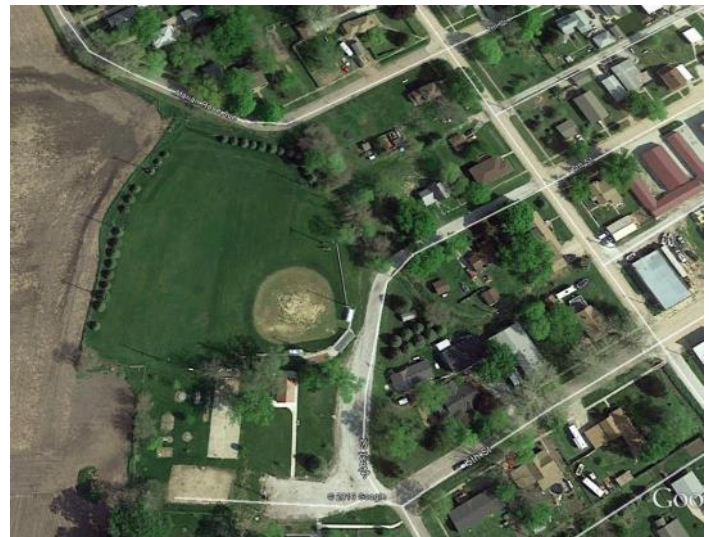


Photo 6.4 Aerial view of Herman Ballfield/Park
Source: Google Earth

Fort Atkinson State Historical Park is located on Madison Street in Fort Calhoun, 10 miles southeast of Blair. Fort Atkinson enjoys a prominent position in the history of the area, of Nebraska, and of the United States. Fort Atkinson was established as the first U.S. military post west of the Missouri River in 1819, and was an active post from 1820 until 1827. Over 1,000 soldiers were garrisoned at Fort Atkinson. This fort was charged with the often-impossible task of regulating the fur trade and enforcing peaceful relations between traders and Indian tribes.

County Facilities

There is a visitor center at the Park that is open daily from late May until early September 4, and weekends only from early September until late October. The park also offers a living history. One weekend per month, from May until October, volunteers portray what life was like for persons living at Fort Atkinson in the 1820s. This portrayal lasts from 11 a.m. until 5 p.m.



Photo 6.5 View of Fort Atkinson State Historical Park

Summit Lake State Recreation Area is located two miles west of Tekamah, in Burt County, which is approximately 22 miles north of Blair. There are 345 acres of pasture on which to hunt for pheasant, quail, rabbit, squirrel, and waterfowl. There is also 190 acres of water for boating, fishing, and swimming activities. The park also offers RV and tent camping, and picnic facilities.

Pelican Point State Recreation Area is located four miles north and 4 miles east of Tekamah, in Burt County, which is approximately 27 miles northeast of Blair. The area offers 36 acres of pasture for hunting quail, rabbit, squirrel, and waterfowl.

Middle Decatur Bend Wildlife Management Area is located four miles east of Decatur, in Burt County, which is approximately 40 miles north of Blair. This area is accessible only by boat from the Missouri River. It offers 25 acres of pasture, and 108 acres of timber. Hunting for deer and waterfowl is allowed.

Powder Horn Wildlife Management Area is located nine miles south of West Point, in Dodge County, which is approximately 38 miles northwest of Blair. The

area includes 83 acres of crop, 183 acres of timber, and 18 acres of water. Hunting is allowed for deer, dove, squirrel, quail, rabbit, turkey, and waterfowl.

Fremont State Recreation Area is located three miles west of Fremont, in Dodge County, which is approximately 27 miles southwest of Blair. This area is a popular destination for vacationers. The area offers 400 acres of pasture, but hunting is prohibited. Some of the amenities offered by the park include power boating, swimming, fishing, non-power boating, camping, and picnicking. The park also includes 269 acres of water divided among 20 sandpit lakes, each of which offers different amenities. Fishing is popular here, and there are many species to catch, including crappie, bluegill, catfish, northern pike, largemouth bass, rock bass, redear sunfish, green sunfish, and carp. There are limitations on boating at different times of the day. The stock of the lakes may be rotated from time to time in order to manage the various species of fish.

Wilson Island, named after former Governor George Wilson, came into existence as an island sandbar around 1900. Today, Wilson Island State Recreation Area encompasses 577 acres of dense cottonwood stands. Located approximately 12 miles to the east of Blair. Seclusion is one of the area's greatest assets and spacious shady campsites, hiking trails and picnic spots provide a welcome retreat.

Wildlife is abundant in the park and a visitor may see deer grazing in the park's fields or be awakened by a huge flock of snow geese flying low overhead in the fall. Bald eagles are often perched in the tall cottonwoods during the winter and mushroom hunters will find no better place in the spring.

En route to Wilson Island, visitors will see the unique wave-like loess hills which overlook the great Missouri River flood plain. These rugged hills are found along the Missouri River Valley in Nebraska and Missouri. Early history tells us that Lewis and Clark traveled and camped on this reach of the Missouri River in 1804 - 1806 on their historic trip to and from the Pacific Coast.

Other Regional Attractions, Parks, and Recreational Opportunities

- **Camp Fontanelle** - Fontanelle, NE
- **Jackson's Buffalo Farm** - Omaha, NE
- **Pheasant Bonanza** - Tekamah, NE
- **Riverview Park** - Blair, NE
- **Silvercreek Hill Vineyards & Winery** - Tekamah, NE

- **Skinny Bones: Pumpkin Patch & Corn Maze**-Blair, NE
- **Santa's Woods** - Blair, NE
- **Strohm Vineyards** - Fort Calhoun, NE
- **Too Far North** - Fort Calhoun, NE
- **Washington County Historical Museum**

FEDERAL FACILITIES

Boyer Chute National Wildlife Refuge is located three miles east of Fort Calhoun, along the Missouri River. The refuge includes a restored three-mile long river channel surrounded by 2,000 acres (approved to expand up to 10,000 acres) of grassland, woodland, and wetlands. This area is an example of a multi-jurisdictional cooperation (In addition to the U.S. Fish and Wildlife Service, the Army Corp of Engineers, and other local agencies were involved.) that successfully benefited the area by restoring important habitat as well as creating a recreation area. There are two short nature trails and a four-mile long hiking trail. The refuge is open daily during daylight hours, admission is free, and it is handicapped accessible. Activities include fishing, canoeing, and bird watching. Picnic areas are provided.



Photograph 6.6 Aerial view of Boyer Chute Wildlife Refuge
Source: Google Earth

De Soto Bend, a national wildlife refuge area located in the wide floodplain of the Missouri River, is widely known for its traditional waterfowl flyway every spring and fall. The refuge encompasses approximately 7,800 acres of which 2,000 are in agricultural production. Since 1965 1,500 acres of the refuge has

been transformed back into grasslands. This area is expanding every few years to incorporate more land into the wildlife management area.

A major attraction within the park is the Bertrand Steamboat excavation site and the various artifacts found within the hull of the 1860's era sternwheeler. Along with this site there are various other recreation-related activities including the De Soto Bend Visitor's Center, fishing, hunting, boating, and mushroom gathering.

The following trails are also developed within this area:

- Bertrand Trail
- Runs along the old river channel through grassland and marsh habitats.
- Cottonwood Trail
- Wood chip trail through the woods $\frac{3}{4}$ of a mile long.
- Wood Duck Pond Trail
- Crosses through Wood Duck Pond and lead through woods and along grasslands
- Missouri Meander Trail
- A handicapped accessible trail adjacent to the De Soto Visitor's Center with year round access.



Photograph 6.7 Aerial view of DeSoto Bend
Source: Google Earth

County Facilities

GOLF COURSES

The following is a brief description of the local golf courses in and around Washington County.

River Wilds Golf Club - Blair

Located on Highway 75, two miles North of Blair. This is an 18-hole, par 72, semi-private golf course. Non-members can play weekdays before 4 p.m. The course is generally flat and lush and well maintained. A clubhouse with bar and cooking facilities and cart space is available to members. The foothills located west of the course offer a scenic backdrop to the course, especially at dusk.

Other golf courses serving the Washington County area include:

<u>Course</u>	<u>Community</u>
Benson Golf Course	Omaha
The Champions Club	Omaha
Elkhorn Ridge Golf Course	Omaha
Happy Hollow County Club	Omaha
The Knolls Golf Course	Omaha
Indian Creek Golf Course	Omaha
Omaha County Club	Omaha
Pacific Springs Golf Course	Omaha
Shoreline Golf Course	Omaha

MUSEUMS

Washington County Museum

Located at 102 North 14th Street in Fort Calhoun opened in 1938 in the former Fort Calhoun Bank building. In 1968 the Edith L. Neale wing was added and then in 1989 the North gallery was added to the structure. The museum is open seasonally from March through mid December. In addition to regular exhibits the museum holds special exhibits throughout the year. The museum houses various records which include: biographies, histories, cemetery records, family and community photographs, federal census atlases, obituaries, old newspapers, school records, and vital statistics both on film and microfiche.

HISTORICAL SITES

Frank Parker Archeological Site

This archeological site contains adjacent areas located within the remnant of a terrace near a former channel of the Missouri River. The site contains previously excavated and newly discovered evidence of an earth lodge settlement from the Nebraska phase of the central plains tradition (A.D. 1000-1400). The site has already contributed to our understanding of Nebraska phase architecture,

feature organization and material culture and has the potential to yield important information with further archeological investigation. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)



Photograph 6.8
Washington County Historical Museum

Fort Atkinson State Historical Park

The Yellowstone Expedition, under the command of Colonel Henry Atkinson, traveled up the Missouri in 1819 with the intention of establishing military posts near Council Bluffs, the Mandan villages, and the Yellowstone River. Only the former was established and named Fort Atkinson. The post was constructed on a prominent Missouri River terrace near present Fort Calhoun in 1820 and occupied until 1827. Fort Atkinson was the only American military post west of the Missouri at that time. The fort was critical in forging political links between the U.S. government and local Indian tribes, as well as protecting American fur trade and frontier interests. The fort consisted of a 450-foot-square barracks quadrangle with two bastions enclosing the parade ground, magazine, and possibly other structures. A wide assortment of structures was built on the exterior including a council house, stables, carpentry and blacksmith shops, laundresses' quarters, and slaughterhouses. Based on over ten seasons of archeological fieldwork, most of the fort has been reconstructed and an interpretive center established. It is operated as a state historical park by the Nebraska Game and Parks Commission. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Bertrand Steamboat Site

Beginning in the early nineteenth century, steamboat traffic increased on the Missouri River. The *Bertrand*, owned by the Montana and Idaho Steamship Lines, was one of the largest steamboats to ply the Missouri

north of the Platte River. The 160 by 30 foot sternwheeler hit a snag on the Missouri River north of Omaha and sank in April 1865. The boat was discovered and excavated in the late 1960s. The artifacts recovered are displayed in the *Bertrand* museum at the DeSoto National Wildlife Refuge. The steamboat hull was reburied at the site of its discovery. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Long Creek School District 8

The Long Creek School District 8, located near Blair, is a one-story, one-room, frame building constructed in 1889. It is an excellent example of a property type that illustrates an historically significant pattern of rural education. This particular pattern persisted through the twentieth century despite many changes in educational policy and reform. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Old McDonald Farm

Located in Washington County, the farmhouse was constructed in 1896 with other buildings added in subsequent years. The farmstead is significant for its association with the broad pattern of agricultural development in Washington County. The collection of late-nineteenth and early-twentieth-century farm buildings retains a high degree of integrity. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Congregational Church of Blair

The Congregational Church of Blair is a good example of the Carpenter Gothic style. The board and batten structure was constructed in 1874 by George Sutherland, a local builder, to the designs of Charles F. Driscoll, an Omaha architect. Several additions were made in later years. Eight charter members organized the church on February 10, 1870, eleven months after Blair was platted. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

C.C. Crowell, Jr. House

The C. C. Crowell, Jr. House was built in 1901 by Christopher Columbus Crowell, Jr. and is transitional in style, exhibiting both Queen Anne and Neo-Classical Revival details. The Crowell family and their businesses, the Crowell Lumber and Grain Company and the Crowell Elevator Company, were associated with the development and commercial growth of the city of Blair for seventy years. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Abraham Castetter House

Located on what was known as "Silk Stocking Row" in Blair during the late nineteenth and early twentieth

centuries, the Abraham Castetter house is a product of Eclecticism. The original house was built in the French Second Empire style in 1876, with later additions following various architectural styles that were popular during the 1880s and 1890s. Castetter, a native of Ohio, moved to Blair in 1869 and entered the banking business. In 1898 he established "The Banking House of A. Castetter." In 1887 Castetter deeded to the city land which formed the nucleus of the city park. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Washington County Courthouse

Washington County was among the earliest organized in Nebraska, having been established in 1854. After residing in De Soto and Fort Calhoun, the county seat was assigned to Blair in 1869. In 1889 voters passed a bond issue to help finance the construction of a courthouse. Work began the same year, but because of some delays the Romanesque Revival-style courthouse was not finished until 1891. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)



Photograph 6.9
Washington County Courthouse

Blair High School

Located in Blair, the Blair High School was constructed in 1899. It is a two-story over raised basement brick structure designed in the Richardsonian Romanesque style. The original H-plan, sheltered by a series of hipped roofs, had two additions appended to the north. The first, a two-story gable roofed brick Colonial Revival annex was added in 1929. In 1967 a small, one-story, flat-roofed brick structure was appended to the west facade of the 1929 addition. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

County Facilities

Fontanelle Township Hall

The Fontanelle Township Hall is a well-preserved example of the township meeting hall. Fontanelle voters held their first annual meeting in April 1884, and in 1896 they approved the construction of a one-story brick hall. The building served as a meeting hall and polling place for the local rural residents.

(Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Alfred H. and Sarah Frahm House

Constructed in 1905 the Frahm House is located in Fort Calhoun. The house is significant because of its unique architecture. This eclectic residence is an irregularly shaped, two-story wood-frame structure. The asymmetrical massing and hipped portions of the roof with lower cross gables resemble the Queen Anne style. The architectural details of this house, however, are Colonial Revival. (Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

EDUCATION

PUBLIC SCHOOLS

The public schools in Nebraska are grouped into six classes, depending upon the type of educational services provided and the size of the school district. The six classes, as defined by the State of Nebraska, are:

Class 1 Dissolved by Legislative action

Class 2 Any school district with territory having a population of 1,000 inhabitants or less that maintains both elementary and high school grades under the direction of a single school board.

Class 3 Any school district with territory having a population of more than 1,000 and less than 100,000 that maintains both elementary and high school grades under the direction of a single school board.

Class 4 Any school district with territory having a population of 100,000 or more and less than 200,000 inhabitants that maintains both elementary and high school grades under the direction of a single school board.

Class 5 Any school district with territory having a population of 200,000 or more that maintains both elementary and high school grades under the direction of a single school board.

Class 6 Any school district that maintains only a high school under the direction of a single school board. The territory of Class 6 district is made up entirely of Class 1 districts (or portions thereof) that have joined the Class 6.

Blair Public Schools

The Blair Public School system consists of seven schools throughout the community. Facilities include one high school, two middle schools, and five primary schools. The district offices are located at 2232 Washington Street.

The district is well poised to serve population growth, with 2014-2015 enrollment at 77% of total design capacity for all facilities. Currently the middle school is the facility operating with the highest enrollment to capacity ratio. In the 2014-2015 school year, Otte Middle School was at 91% of designed capacity. The school system demonstrates the flexibility to shift enrollment grade levels at each facility to best-serve student population shifts.

(Source: Blair Comprehensive Plan 2015)

The Districts seven facilities include:

- Blair High School
- Gerald Otte Blair Intermediate School
- Blair Arbor Park School
- Blair North Primary School
- Blair South Primary School
- Blair West School
- Deerfield Primary School

Early Childhood Programs

Blair Public Schools offers the "Blair Community Schools Early Childhood Preschool Program". Located at 1653 Colfax, the program's goal is to provide a high quality early childhood experience to prepare children for Kindergarten.

(Source: Blair Comprehensive Plan)

Arlington Public Schools

Education in western Washington County is provided primarily by the Arlington Public Schools (APS). APS is accredited by the State of Nebraska. The district is a Class 3 school district. The District operates two facilities:

- Arlington Elementary
- Arlington Middle/High School

Fort Calhoun Public Schools

The public school district serving Fort Calhoun and surrounding areas is the Fort Calhoun Community School District. The District is considered a Class 3 District. The district operates four school facilities:

- Fort Calhoun Elementary School
- Fort Calhoun Jr./Sr. High School
- Pioneer Learning Center
- Community Building

County Facilities

FIGURE 6.2: SCHOOL DISTRICT MAP
WASHINGTON COUNTY PUBLIC SCHOOL DISTRICT

FIGURE 6.2: FIRE DISTRICT MAP

Other Public Schools serving Washington County

Besides the three primary public school districts serving Washington County, there are several additional public school districts with small territories in Washington County. These include:

- Logan View Public Schools
- Bennington Public Schools
- Tekamah-Herman Public Schools

Parochial Schools serving Washington County

Besides the public school districts serving Washington County, there is one parochial school serving residents in Washington County. The school system is Fremont Bergan Schools in Fremont.

Post-Secondary Education

There are no post-secondary educational facility located in Washington County.

The residents of Washington County and the surrounding area have a large selection of in-state post-secondary schools to select. Some of these include:

- University of Nebraska-Lincoln
- Nebraska Wesleyan
- Union College
- Southeast Community College
- Kaplan University
- University of Nebraska-Omaha
- Creighton University
- University of Nebraska Medical Center
- Clarkson College
- College of St. Mary
- Grace College of the Bible
- Metropolitan Community College
- Methodist College of Nursing and Allied Health
- Midland Lutheran College

FIRE AND POLICE PROTECTION

Fire and Rescue

Fire and rescue in Washington County is handled through 10 different volunteer departments. These departments are located in Arlington, Bennington, Blair, Craig, Fort Calhoun, Herman, Kennard, Nickerson, Uehling, and Winslow.

LAW ENFORCEMENT

Washington County Sheriff's Department

Law enforcement in Washington County is the responsibility of the Washington County Sheriff. The office of the Washington County Sheriff is located at

1535 Colfax Street in Blair, adjacent to the Washington County Courthouse. This facility also serves as the offices for the Blair police department. The communities of Herman and Washington do not have independent police departments; therefore, they rely solely on the Washington County Sheriff for protection.

Based upon data from the Nebraska Commission on Law Enforcement and Criminal Justice, Washington County had 27 full-time and 5 part-time sworn officers in 2015. The prior two years can be seen in Table 6.1. However, there were several years, beginning in 2013 and going back, where Washington County was not accounted for within the annual Crime Commission Report.

TABLE 6.1: SWORN OFFICER COMPARISON

County	2013		2014		2015	
	Sworn Officers FT/PT	Officers per 1,000 Population	Sworn Officers	Officers per 1,000 Population	Sworn Officers	Officers per 1,000 Population
Washington	NA	NA	24/3	2.2	27/5	2.2
Douglas	123/0	1.2	124/0	1.3	125/0	1.4
Dodge	21/0	2.2	21/0	2.2	20/0	2.1
Burt	4/2	0.9	4/1	1.3	5/0	1.3

Source: Nebraska Commission on Law Enforcement and Criminal Justice 2016

When examining the number of sworn officers per 1,000 people, the Washington County Sheriff's office had an average of 2.2 sworn officers per 1,000 people in 2015.

Table 6.1 also shows the number of sworn officers and officers per 1,000 persons in the surrounding counties. The county with the highest ratio in 2015 was Washington County at 2.2 officers per 1,000 people; followed closely by Dodge County with 2.1 sworn officers per 1,000 people.

The ratio of law enforcement officers per 1,000 persons in the population for any given area is influenced by many factors. The determination of law enforcement strength for a certain area is based on such factors as population density, size and character of the county, geographic location and other conditions existing in the area. The data indicate Washington County has been maintaining a ratio of 2.2 sworn officers per 1,000 people over a

County Facilities

period of time; apparently this is a good balance for Washington County.

COUNTY BUILDINGS

County Courthouse

Washington County was among the earliest organized in Nebraska, having been established in 1854. After residing in De Soto and Fort Calhoun, the county seat was assigned to Blair in 1869. In 1889 voters passed a bond issue to help finance the construction of a courthouse. Work began the same year, but because of some delays the Romanesque Revival-style courthouse was not finished until 1891.

(Source: <http://www.nebraskahistory.org/histpres/nebraska/Washing.htm>)

Washington County Fairgrounds

The Washington County Fairgrounds are located just off US Highway 30 in Arlington.



Photograph 6.10 Aerial of the Washington County Fairgrounds
Source: Google Earth

COMMUNICATION

Telephone Services

There are numerous telephone providers serving Washington County.

Radio Stations

There is one radio station based in Blair, as well as, several radio stations serving the Washington County area. Other stations are based and broadcast from Fremont and Omaha which are approximately 20 miles from Blair.

Television Stations

Presently there are no local television stations located in Washington County. The over the air stations that serve the area originate out of Omaha in Nebraska, as well as other points to the north and east.

Besides over the air television, there are a number of cable television suppliers as well as satellite providers.

Internet/World Wide Web Service Providers (ISP)

High speed Internet service is provided in Washington County by numerous companies.

Newspapers

The residents of Washington County are served locally by the Washington County Enterprise and Pilot Tribune. Listed below are newspapers with daily circulation within the Washington County area:

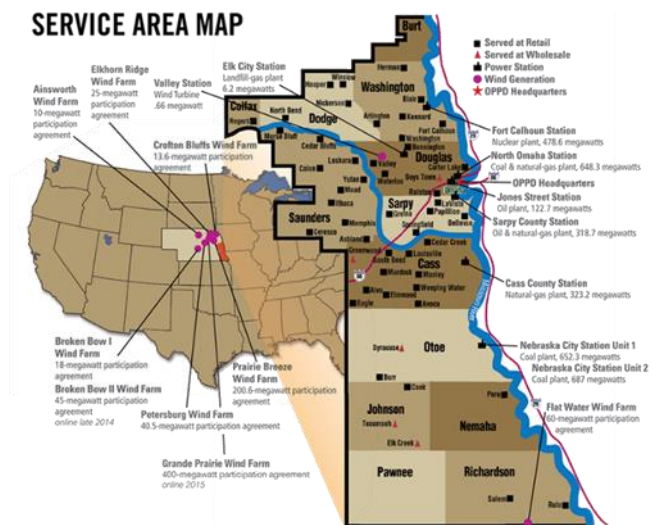
- Lincoln Journal Star
- Omaha World-Herald

PUBLIC UTILITIES

Electricity

Omaha Public Power District provides power to most of rural Washington County.

FIGURE 6.4: SERVICE AREA MAP - OPPD 2016



Source: <http://www.oppd.com/about/service-area/>

Natural Gas

Natural gas supplies in Washington County is handled by Black Hills Energy.

Solid Waste

Sanitation collection in Washington County is

provided by private haulers.

HEALTH CARE

Memorial Community Hospital and Health System

Located at 810 N. 22nd Street. The medical staff serves the residents of Washington and Burt counties by providing primary care services at the Blair Clinic, on the main campus, and through outreach clinics in surrounding communities. The Specialty Clinic hosts more than 30 physicians practicing in a wide range of specialties from allergies and asthma to urology and pulmonology. Surgical services are offered in orthopedics, ophthalmology, urology, podiatry, OB/GYN, ear nose and throat (ENT), and general surgery. (Source: Blair Comprehensive Plan)

FACILITIES GOALS AND POLICIES

Parks and Recreational Goals

Parks and Recreation Goal 1

Development of a county-wide trails system will aid in the long-term recreational and walkability needs as well as creating a tourism destination for the county.

Parks and Recreation Policies and Strategies

- PR-1.1 The County should complete a long-range trails Master Plan in order to identify specific locations, routes and amenities to connect.
- PR-1.2 The County should work with the NRD's to determine potential funding for the planning and construction of recreational trails within Washington County.
- PR-1.3 The County should, as the paved county roads are repaired, overlaid, etc. work to incorporate a standard trail width to the shoulder of the roadway.
- PR-1.4 A trail system should work to connect different entities within Washington County together as well as connect to other regional trails in the area.

Parks and Recreation Goal 2

Washington County will continue to work closely with different entities including the community's and NRD to maintain and enhance the existing parks, camps, riverfront, and lakes.

Parks and Recreation Policies and Strategies

- PR-2.1 The County should continue promoting the areas recreational destinations, especially along the Missouri River.
- PR-2.2 The should continue to promote local agri-tourism.

Educational Goals

Educational Goal 1

Quality education is a vital component of positive growth. Although the County's role is limited, objectives and policies need to be established with regard to locating development to insure cost effective use of existing facilities.

Educational Policies and Strategies

- EDU-1.1 Continue to cooperate with the school systems in expanding public uses of educational facilities.
- EDU-1.2 The school districts should review all new development proposed within the zoning jurisdiction of Washington County so they can accommodate future school populations.

Educational Goal 2

The county should coordinate with the school districts to insure adequate areas for future educational needs. Above all, the main goal is to encourage excellence in the school curriculum and facilities.

Educational Policies and Strategies

- EDU-2.1 Cooperate with school systems on any future expansion or the development of new joint facilities.
- EDU-2.2 Work with students to continually identify new facilities needed in the future.

Public Safety Goals

Public Safety Goal 1

The goal of Washington County (residents) is to maintain fire protection, rescue and ambulance programs by exploring programs and alternative services to insure optimum service levels and public costs.

Public Safety Policies and Strategies

- PS -1.1 The different fire and rescue organizations and the county should continue to work to maintain quality equipment levels.
- PS-1.2 The fire departments should continue to expand fire safety education and prevention throughout the county.

County Facilities

Public Safety Goal 2

The goal of Washington County is to maintain quality law enforcement throughout the county.

Public Safety Policies and Strategies

- PS-2.1 Continue to identify specific ways to work cooperatively with the County Sheriff regarding protection in Washington County.
- PS-2.2 Continue to support minimum standards regarding equipment used by law enforcement.

Public Safety Goal 3

The goal of Washington County is to maintain regulations to protect the general health and safety of all residents.

Public Safety Policies and Strategies

- PS-3.1 Establish regulations protecting the county residents from the secondary effects of adult entertainment.



7

Energy Element



Energy Element

ENERGY ELEMENT

Energy usage in the early 21st Century is becoming a critical issue throughout Nebraska as well as the entire United States. Our dependency on non-renewable energy sources has increased significantly over the past 100 years.

Energy consumption comes in several forms, such as:
Lighting our homes, businesses, and industries

- Cooling and heating our homes, businesses, and industries
- Heating our water for homes, businesses, and industries
- Food preparation
- Transportation – both personal and business related
- Agricultural equipment
- Recreation and Entertainment – vehicular, computers, music, etc.

The 21st Century ushered in an increased concern for energy usage and its impacts on the environment. This increased concern for the environment created a better understanding of the carbon footprint generated by any one individual as well as striving towards modifying our behavior patterns in order to lessen the footprint. In addition, the phrase and concept of sustainability has become more widely used, even in Nebraska.

Energy and the issues connected to the different sources are becoming more critical every year. The need for the Energy Element in the Washington County Comprehensive Development Plan should be something desired as opposed to required. However, during the 2010 Legislative Session of the Nebraska Unicameral, the State Senators passed LB 997 which required this section become a part of all community and county comprehensive plans, except for villages.

SUSTAINABILITY

Sustainability, in today's discussions, has a number of meanings. According to Webster's Third International Dictionary, the verb "sustain" is defined as "to cause to continue...to keep up especially without interruption, diminution or flagging". However, the American Planning Association has come up with the following definition:

"Planning for 'sustaining places' is a dynamic, democratic process through which communities plan to meet the needs of current and future generations without compromising the ecosystems upon which they depend by balancing social,

economic, and environmental resources, incorporating resilience and linking local actions to regional and global concerns".

In other words, sustainability is the ability of present day generations to live without jeopardizing the ability of future generations to sustain life as we know it today.

All of us living in today's world need to begin switching gradually to cleaner and more renewable resources. By doing so it will aid future generations with their quality of life. The more renewable energy sources become the norm for our generation, the more likely these sources will be second nature and common in the future.

Americans have grown to rely more heavily on electricity. However, state and federal policies have been more insistent on curbing the level of our reliance on electricity; especially, those sources produced by non-renewable fossil fuels such as oil and coal. Federal policy has set a goal for 20% of all electricity, by 2020, in the United States be from renewable sources such as solar and wind.

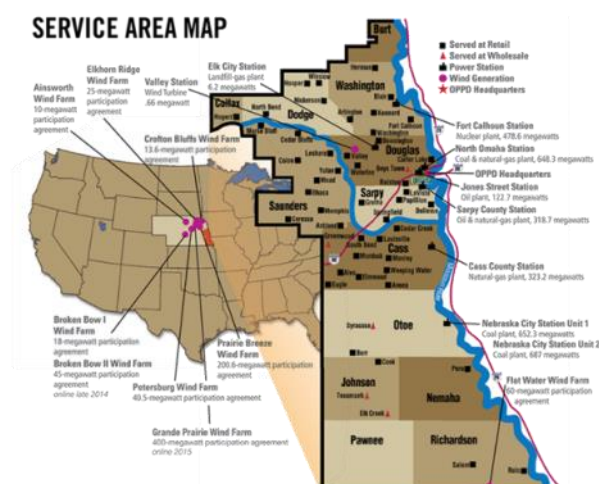
So, what can Washington County do to be more sustainable? There are a number of activities that can be undertaken and pursued to make an impact. The following information will meet at a minimum, the requirements of LB 997 but will also provide basic strategies Washington County can undertake to make a contribution to the overall energy solution.

ENERGY INFRASTRUCTURE

Electrical Power-OPPD

Electrical power in Washington County is predominately supplied by the Omaha Public Power District (OPPD). OPPD supplies electricity to a large portion of eastern Nebraska residents in the Omaha Metropolitan Area. The district is headquartered in Omaha. Currently, OPPD has a mixture of power generation including coal, wind, landfill-gas recovery and nuclear.

Figure 7.1: OPPD Service Area



In June 2014, OPPD announced a plan to decrease the district's dependence on non-renewable sources. After a survey of OPPD customers, the OPPD managers took the information and put together different options for meeting the desires of the consumers. There were initially three options **"...and recommended one that will cut emission levels on various chemicals and gases by up to 85 percent. After studying the options, the board told management to proceed on that recommendation at its June 19, 2014 public meeting."**

"Following the plan, OPPD will shut down three of the five units at its North Omaha Station in 2016 and put stronger emissions controls on the other two units. Then, in 2023, OPPD will quit burning coal altogether in Omaha. Also in 2016, stronger emissions controls will be installed on Nebraska City Station's older coal unit. It will also enact new energy-efficiency programs for customers and programs to reduce power usage. This reduction will cut OPPD's need to generate power at key times by 300 megawatts, or 300 million watts."

"It's a comprehensive plan that, combined with additional wind energy already contracted for in the next few years, means the electricity OPPD customers use will continue to get cleaner and cleaner."

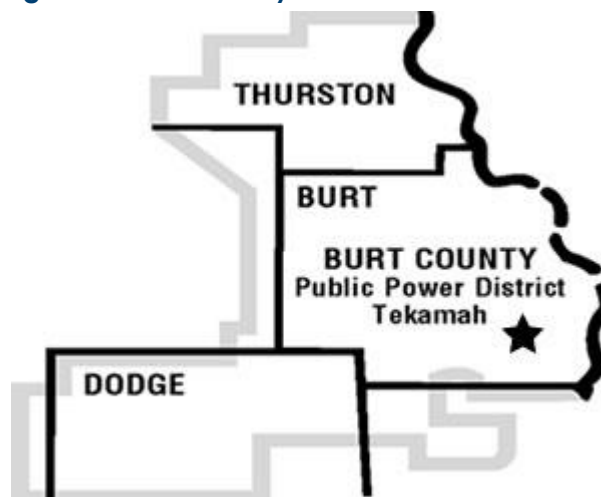
Source: OPPD News Release

Electrical Power-Burt County Public Power District

In addition, portions of northern Washington County are served by Burt County Rural Public Power based in Tekamah. Burt County Public Power provides electricity to all of Burt County and portions of

Cuming, Dodge, Thurston, and Washington County's including the cities of Uehling, Rosalie, and Macy. Burt county public power provides wholesale electricity to the Village of Decatur, NE.

Figure 7.2: Burt County PPD Service Area



Source: <http://www.burtcoppd.com/servicearea.asp>

BCPPD has a total of 4,096 customers and 2,086 miles of line.

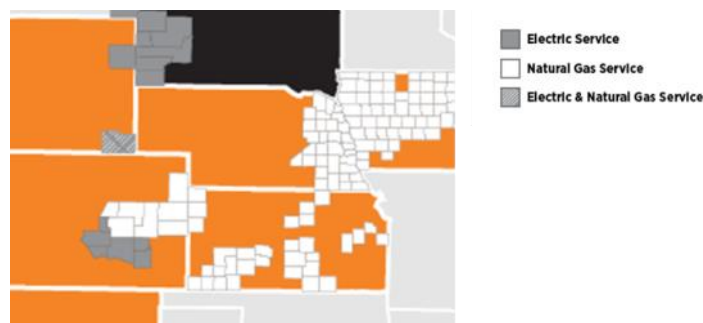
Electrical Distribution

The overall distribution system is in good condition. The systems are owned and operated by OPPD and BCPPD. The distribution systems not only supply power throughout Washington County but are the foundation for power transmitted to other customers in eastern Nebraska.

Natural Gas Service

Natural gas supplies in Washington County are controlled by Black Hills Energy.

Figure 7.3: Black Hills Energy Service Area



Source: <http://www.blackhillscorp.com/sites/default/files/2012-Map-svc-area.png>

Energy Element

Black Hills Energy provides electric and natural gas service to more than 600,000 customers in hundreds of communities throughout Colorado, Iowa, Kansas and Nebraska.

Source: <http://www.blackhillscorp.com/utilities-businesses/utility-services>

ENERGY USE BY SECTOR

This section analyzes the energy use by residential, commercial, industrial and other users and will examine the different types of energy sources that are utilized by these different sectors.

Residential Uses

Within Washington County, residential uses are provided a number of options for both power and heating and cooling. These include electrical power (both fossil fuel and renewable resources), natural gas, oil, propane, and wood. The most dominant of the energy sources available and used by the residents of Washington County is electricity produced from both fossil fuels and renewable resources.

The use of natural gas, oil, propane and wood will be found typically as heating sources during the winter months. The type of fuel used will depend a great deal on where a residence is located within the county. Residents located within the more urbanized parts of Washington County are more likely to have natural gas heating or electrical furnaces. Propane and wood stoves are most likely found in the rural parts of the county where natural gas infrastructure is not always available.

Commercial Uses

Washington County's commercial uses also have a number of options for both power and heating and cooling. These include electrical power (both fossil fuel and renewable resources), natural gas, propane, oil and wood. The type of energy source is very dependent upon the specific commercial use and the facilities employed to house the use. The most dominant of the energy sources available is electricity produced from both fossil fuels and renewable resources.

Similar to residential uses, the use of natural gas, oil, propane and wood will be found typically as heating sources during the winter months. The type of fuel used will depend a great deal on the type of commercial use and the construction of the building (s) involved. The location of the commercial uses will also dictate, similar to residential uses, what type of

heating fuels are used. However, in commercial uses such as repair garages and other uses in larger metal buildings, they may be dependent upon recycling used motor oils to heat their facilities.

Industrial Uses

Washington County's industrial uses will be very similar to those discussed within the commercial section. However, in some cases, diesel fuel can play a role in both power generation and heating and cooling.

SHORT-TERM AND LONG-TERM STRATEGIES

As the need and even regulatory requirements for energy conservation increases, residents of Washington County will need to:

1. Become even more conservative with energy usage
2. Make use of existing and future programs for retrofitting houses, businesses, and manufacturing plants
3. Increase their dependence on renewable energy sources.

RESIDENTIAL STRATEGIES

There many different strategies that can be undertaken to improve energy efficiency and usage in residences. These strategies range from simple (less costly) to complex (costly). Unfortunately, not all of the solutions will have an immediate return on investment. As individual property owners, residents will need to find strategies that fit their budgets to invest in the long-term savings.

There are several ways to make a residence more energy efficient. Some of the easiest include:

- Converting all incandescent light bulbs and Compact Florescent Lights (CFL) to Light Emitting Diodes (LED) or the most recent technology to conserve energy.
- Installing additional insulation in the attic.
- Converting standard thermostats to digital/programmable thermostats.
- Changing out older less efficient air conditioners and furnaces/boilers to newer high-efficiency units
- Changing out older appliances with new EnergyStar appliances.
- Exchanging less efficient water heaters with EnergyStar units or on demand systems.

Some of the costlier ways to make a residence more energy efficient include:

- New insulation in exterior walls.

- Addition of solar panels for either electrical conversion and/or water heater systems.
- Adding individual scale wind energy conversion systems.
- Installing a geothermal heating and cooling system.
- Installation of energy-efficient low-e windows.

COMMERCIAL/INDUSTRIAL STRATEGIES

Strategies for energy efficiency within commercial/industrial facilities are more difficult to achieve than those for residential uses. Typically, these improvements will require a greater amount of investment due to the size of most of these facilities.

There are a number of different strategies that can be undertaken to improve energy efficiency and usage in commercial and industrial facilities. Again, not all of the solutions will have an immediate return on investment. Businesses and industries will need to find strategies that will fit into their ability to pay for savings at the present time.

There are several ways to make businesses/industries more energy efficient. Some of the easiest include:

- Converting all incandescent light bulbs and CFL's to LED's or better on small fixtures.
- Converting all florescent lights to more efficient florescent systems.
- Converting standard thermostats to digital/programmable thermostats.
- Installing additional insulation in an attic space.
- Changing out older less efficient air conditioners and furnaces/boilers to newer high-efficiency units.
- Exchanging less efficient water heaters with EnergyStar units or on demand systems.

Some of the costlier ways to make a business more energy efficient include:

- Installation of energy-efficient low-e windows and/or storefronts.
- New insulation in exterior walls.
- Addition of solar panels for either electrical conversion and/or water heater systems.
- Adding individual scale wind energy conversion systems.
- Installing a geothermal heating and cooling system.
- New storefronts with insulated panels and insulated Low-E glazing.

PUBLIC STRATEGIES

Energy efficiency strategies for public facilities are similar to those of commercial and industrial users. Typically, these improvements will require a greater amount of investment due to the size of most of these facilities. However, in some cases there are grants available from time to time to assist public agencies with these improvements.

There are a number of different methods that can be undertaken to improve energy efficiency and usage in public facilities, including:

- Converting all incandescent light bulbs and CFL's to LED's or better on small fixtures.
- Converting all florescent lights to more efficient florescent systems.
- Converting standard thermostats to digital/programmable thermostats.
- Installing additional insulation in an attic space.
- Changing out older less efficient air conditioners and furnaces/boilers to newer high-efficiency units.
- Exchanging less efficient water heaters with EnergyStar units or on demand systems.

Some of the costlier ways to make public facilities more energy efficient include:

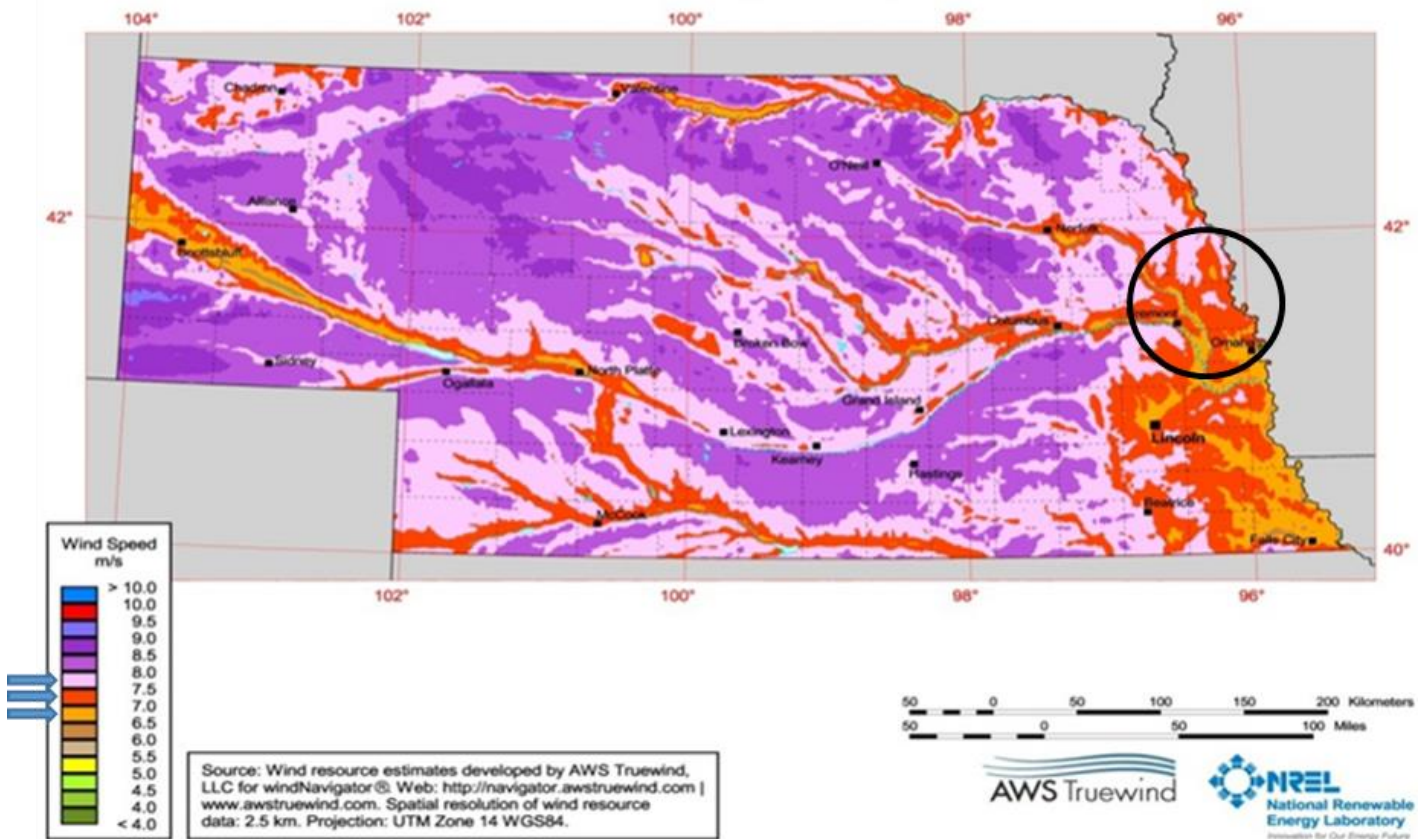
- Installation of energy-efficient low-e windows and/or storefronts
- New insulation in exterior walls
- Addition of solar panels for either electrical conversion and/or water heater systems
- Adding individual scale wind energy conversion systems
- Installing a geothermal heating and cooling system
- New storefronts with insulated panels and insulated Low-E glazing

RENEWABLE ENERGY SOURCES

Renewable energy sources, according to most definitions, include natural resources such as the wind, the sun, water, and the earth (geothermal) that can be used over and over again with minimal or no depletion, as well as tapping into sources of methane (from natural resources or man-made conditions). The most common sources of renewable energy used in Nebraska are the wind, the sun, water and earth. The following are examples of how these renewable resources can be used to reduce dependency on fossil fuels.

Energy Element

Figure 7.4: Annual Average Wind Speed at 80 Meters



WIND

The wind is one of those resources in abundance in Nebraska. Wind is not a new technology in Nebraska; the pioneers that settled in Nebraska used wind mills for power and to work the water wells on their farms and ranches.

Wind can be used to produce electricity through the construction of small-scale or utility/commercial grade wind conversion systems (wind turbines). However, not all areas of the state have the ideal levels needed to produce electricity on a utility or commercial level; but the use of small-scale wind turbines on homes and businesses will work in most parts of Nebraska.

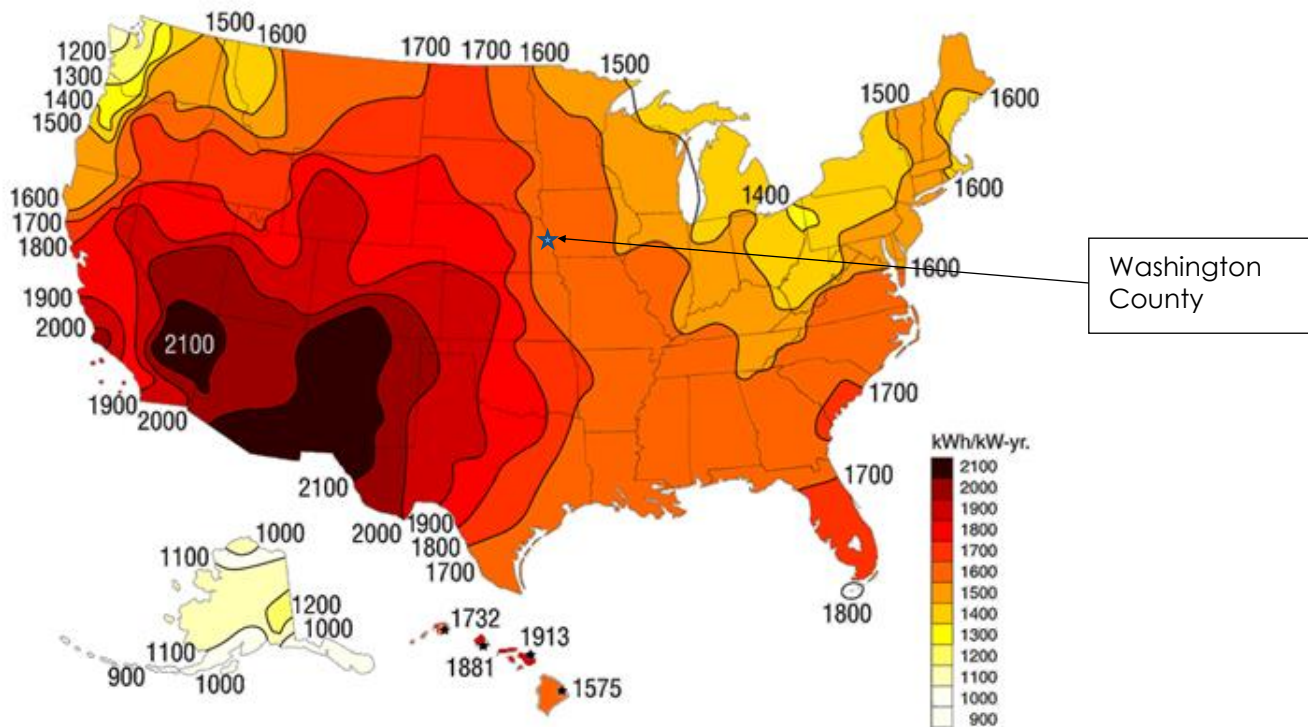
SOLAR

Solar energy has been around for decades and it last hit a high in popularity in the 1970's. However, today's solar energy design is much more efficient and aesthetically pleasing. Some of the aesthetic improvements have to do with the fact that today's systems are not as bulky as their ancestors. Today, solar is being used much like wind turbines, on a small-scale level (home or business) or a much grander level (solar farms).

Solar energy includes solar water and space heating as well as taking solar photovoltaic panels to convert the sun's rays into electricity. Solar panels can typically produce between 120 and 200 watts per square meter at an installed cost of \$11 to \$22 per watt, according to the American Solar Energy Society, but these costs are becoming less every year as more solar units are commissioned and new more cost effective technologies are developed.

Based upon the diagram below there is great solar potential in the state of Nebraska. A majority of the state lies within some of the better areas in the country for solar potential.

FIGURE 7.5: SOLAR CONTOURS



Source: Solar Energy Industries Association

In addition, special urbanized solar farms can be constructed as a dual purpose for generating shade and electricity, as seen on the right (the parking lot is located at 25th and Cuming Streets in downtown Omaha).



In the future, it may become desirable for new subdivisions/developments to incorporate renewable energy systems such as solar and wind. In order for this to occur, a standard subdivision regulation and zoning code would likely need to be modified in order to allow these systems. In addition, the state

regulations under the C-Bed program would likely need to be updated.

GEOTHERMAL ENERGY

Geothermal energy is typically utilized through a process where a series of pipes are lowered into vertical cores called heat-sink wells. The pipes carry a highly conductive fluid that either is heated or cooled by the constant temperature of the ground. The resulting heat exchange is then transferred back into the heating and cooling system of a home or other structure. This is called a geothermal heat exchange system or ground source heat pump. The California Energy Commission estimates the costs of a geothermal system can earn net savings immediately when financed as part of a 30-year mortgage (Source: American Planning Association, PAS Memo January/February 2009).

METHANE ENERGY

The use of methane to generate electricity is becoming more cost-effective to use in Nebraska. Methane electrical generation can be accomplished through the use of a methane digester which takes the raw gas, naturally generated from some form of decomposing material, and converts the gas into electrical power.

Energy Element

There have been some attempts to take the methane generated from animal manure and convert it into electricity; most have been successful but were costly to develop. Another approach to methane electrical generation is to tap into the methane being generated from a solid waste landfill; instead of burning off the methane, it can be piped into a methane convertor and generated into electricity for operating a manufacturing plant or placed on the overall grid for distribution.

Methane convertors make use of unwanted gases and are able to produce a viable product. As long as humans need to throw garbage into a landfill or the production of livestock is required, there will be a source of methane to tap for electrical generation.

STATE PROGRAMS

The following provides a basic history and description of some newer programs in Nebraska; interested parties should contact the State of Nebraska Energy Office or OPPD/BCPPD/Black Hills Energy.

C-BED PROGRAM

In May 2007, Nebraska established an exemption from the sales and use tax imposed on the gross receipts from the sale, lease, or rental of personal property for use in a community-based energy development (C-BED) project. The Tax Commissioner is required to establish filing requirements to claim the exemption. In April 2008 L.B. 916 made several amendments to this incentive, including: (1) clarified C-BED ownership criteria to recognize ownership by partnerships, cooperatives and other pass-through entities; (2) clarified that the restriction on power purchase agreement payments should be calculated according to gross and not net receipts; (3) added language detailing the review authority of the Tax Commissioner and recovery of exempted taxes; and (4) defined local payments to include lease payments, easement payments, and real and personal property tax receipts from a C-BED project.

A C-BED project is defined as a new wind energy project that meets one of the following ownership conditions:

- For a C-BED project that consists of more than two turbines, the project is owned by qualified owners with no single qualified owner owning more than 15% of the project and with at least 33% of the power purchase agreement payments flowing to the qualified owner or owners or local community; or

- For a C-BED project that consists of one or two turbines, the project is owned by one or more qualified owners with at least 33% of the power purchase agreement payments flowing to a qualified owner or local community.

In addition, a resolution of support for the project must be adopted by the county board of each county in which the C-BED project is to be located.

A qualified C-BED project owner means:

- a Nebraska resident;

- a limited liability company that is organized under the Limited Liability Company Act and that is entirely made up of members who are Nebraska residents;
- a Nebraska nonprofit corporation;
- An electric supplier(s), subject to certain limitations for a single C-BED project.

In separate legislation (LB 629), also enacted in May 2007, Nebraska established the Rural Community-Based Energy Development Act to authorize and encourage electric utilities to enter into power purchase agreements with C-BED project developers.

LOCAL GOVERNMENT AND RENEWABLE ENERGY POLICIES

Local governments can take steps to encourage greater participation in wind generation. Cities and counties can pursue strategies to make these projects more attractive, including:

- Develop or amend existing zoning regulations to allow small-scale wind turbines as an accessory use in all districts.
- Develop or amend existing zoning regulations to exempt small-scale turbines from maximum height requirements when attached to an existing or new structure; provided, they meet all building codes and manufacturers requirements for attachment.
- Work with the OPPD on ways to use wind turbines on small-scale individual projects or as a source of power for the community.

NET METERING IN NEBRASKA

LB 436, signed in May 2009, established statewide net metering rules for all electric utilities in Nebraska. The rules apply to electricity generating facilities which use solar, methane, wind, biomass, hydropower or geothermal energy, and have a rated capacity at or below 25 kilowatts (kW). Electricity produced by a qualified renewable energy system during a month shall be used to offset any kilowatt-hours (kWh) consumed at the premises during the month.

Any excess generation produced by the system during the month will be credited at the utility's avoided cost rate for that month and carried forward to the next billing period. Any excess remaining at the end of an annualized period will be paid out to the customer. Customers retain all renewable energy credits (RECs) associated with the electricity their system generates. Utilities are required to offer net metering until the aggregate generating capacity of all customer-generators equals one percent of the utility's average monthly peak demand for that year.

STATE LAW OF SOLAR AND WIND EASEMENTS

Nebraska's solar and wind easement provisions allow property owners to create binding solar and wind easements for the purpose of protecting and maintaining proper access to sunlight and wind. Originally designed only to apply to solar, the laws were revised in March 1997 (LB 140) to include wind. Counties and municipalities are permitted to develop regulations, or development plans protecting access to solar and wind energy resources if they choose to do so. Local governing bodies may also grant zoning variances to solar and wind energy systems that would be restricted under existing regulations, so long as the variance is not substantially detrimental to the public good.

LB 568, enacted in May 2009, made some revisions to the law and added additional provisions to govern the establishment and termination of wind agreements. Specifically, the bill provides that the initial term of a wind agreement may not exceed forty years. Additionally, a wind agreement will terminate if development has not commenced within ten years of the effective date of the wind agreement. If all parties involved agree to extend this period, however, the agreement may be extended.

CURRENT RENEWABLE ENERGY PROGRAMS/ FUNDING SOURCES

There are several programs available through OPPD to assist in purchasing and installing more energy efficient equipment in residences and businesses. In addition, there are funding opportunities through the Nebraska Energy Office.

ENERGY IN WASHINGTON COUNTY

Washington County will continue to encourage the development of energy-related goals, policies and strategies.

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Natural Resources and the Environment



Natural Resources and the Environment

INTRODUCTION

Formulating a truly valid and “comprehensive” plan for future development in Washington County, it is necessary to evaluate the environmental and man-made conditions currently existing in order to determine the impacts these factors may have on future land uses and development in the County. This component of the Washington County Comprehensive Plan provides a general summary of the environmental and man-made conditions, which are present in the County, and identifies and qualifies the characteristics of each which will directly or indirectly impact future land uses in the County.

NATURAL ENVIRONMENTAL CONDITIONS

- Climate
- Relief and Drainage
- Wetlands
- Soil Association
- Soil Limitations
- Prime Farmland
- Percent slope
- Permeability
- Water and the Impact on Washington County
- Hydric soils
- Groundwater
- Transmissivity
- Floodways and floodplains

NATURAL CONDITIONS

Climate

(This information was taken from the Washington County Soil Survey by the United States Department of Agriculture – Soil Conservation Service – 2004)

Washington County in winter, the average temperature is 23.5 degrees F and the average daily minimum temperature is 13.6 degrees. The lowest temperature on record, which occurred on February 2, 1996, is -24 degrees. In summer, the average temperature is 73.4 degrees and the average daily maximum temperature is 84.4 degrees. The highest recorded temperature, which occurred on July 13, 1995, is 108 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 29.90 inches. Of this total, 18.7 inches, or 63 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 5.92 inches on September 12, 1982. Thunderstorms occur on about 49 days each year, and most occur between May and September.

The average seasonal snowfall is 25.3 inches. The greatest snow depth at any one time during the period of record was 24 inches. On the average, 16 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 58 percent. Humidity is higher at night, and the average at dawn is about 78 percent. The sun shines 71 percent of the time possible in summer and 52 percent in winter. The prevailing wind is from the north from January through April and from the south during the rest of the year. Average windspeed is highest, more than 12 miles per hour, in March and April.

Physiography, Relief and Drainage

(This information was taken from the Washington County Soil Survey by the United States Department of Agriculture – Soil Conservation Service – 2004)

There are two major physiographic divisions in Washington County. These are the uplands, which formed in loess and glacial till, and the flood plains, which formed in alluvium, along the Elkhorn and Missouri Rivers.

The Missouri River flood plain has two levels. The first level consists of the channel belt and meander belt areas, which are near the river. These areas are made up of recently deposited material and are characterized by a series of old oxbows and meander scars. This level is occasionally flooded and is commonly known as the low bottom or first bottom. The second level is the flood basin, which is between the uplands and the low bottom. This very level area consists of older sediments deposited in backwaters and is characterized by soils that have a thick, dark surface layer. It is subject to rare flooding and is commonly known as the high bottom or second bottom.

The low bottom is poorly drained and was flooded

frequently before the large mainstream dams were built on the river. The high bottom is better drained and was seldom flooded. Recent channel work has stabilized the course of the river in places so that the present stream may go through some formerly high bottom areas.

The bottom land in the county is 100 to 300 feet below the uplands. The lowest elevation, approximately 1,000 feet above sea level, is along the Missouri River in the southeast corner of the county.

The uplands are part of a dissected plain that makes up eastern Nebraska. Bedrock of the Upper Pennsylvanian sediments underlies the extreme southeast corner of the county. Sandstone and shale of the Dakota Group (Lower Cretaceous) underlie the rest of the county. Over the bedrock is glacial till of Nebraskan and Kansan age. This till is dominantly clay loam. It is exposed along the most deeply entrenched streams. Brown to reddish brown, silty to clayey material of Illinoian age covers the till surface in places. This paleosol ranges from 1 to several feet in thickness. It is known as Loveland loess.

More recent loess deposits mantle all of the uplands and stream terraces and in places are as much as 100 feet thick. The gray, calcareous Peorian loess that covers all of the uplands and stream terraces averages 40 feet in thickness. A discontinuous covering of younger, yellowish brown, slightly calcareous loess, 20 feet thick or more, occurs on wide interfluvial terraces along the Missouri River. The thickness of this material decreases toward the west. These recent loess deposits are thickest on the southern and eastern sides of interfluvial terraces and on level terraces and uplands.

The uplands can be divided into three parts: (1) the level upland divides in the central and western parts of the county and the level, loess-covered stream terraces along the Missouri River and Bell Creek; (2) the gently sloping to rolling uplands in the central part of the county; and (3) the rolling to steeply rolling uplands and bluffs in the eastern part of the county.

The uplands in the northwest corner of the county are about 1,320 feet above sea level. The county generally slopes to the southeast. Bell Creek is about 120 feet below the uplands, and Papillion Creek is 150 to 200 feet below the uplands. The Missouri River is about 300 feet below the upland divide that lies

between it and Papillion Creek. Blair, on the Missouri River terrace, is 1,122 feet above sea level.

All of the drainage in the county flows directly or indirectly into the Missouri River. The Missouri River bottom land and the bluff area drain directly into the Missouri River. The central part of the county is drained by Papillion Creek, which flows into the Missouri River south of Omaha. The western part of the county is drained by the Elkhorn River and by Bell Creek, which flows into the Elkhorn River near the southwest corner of the county. The Elkhorn River flows into the Platte River, which flows into the Missouri River.

WETLANDS

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods during the year, including during the growing season. Water saturation (hydrology) largely determines the soil development and the types of plant and animal communities living in and on the soil. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils. Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors, including human disturbance. Two general categories of wetlands are recognized: coastal or tidal wetlands and inland or non-tidal wetlands.

Inland wetlands found in Washington County are most common on floodplains along rivers and streams (riparian wetlands), in isolated depressions surrounded by dry land (for example, playas, basins, and "potholes"), along the margins of lakes and ponds, and in other low-lying areas where the groundwater intercepts the soil surface or where precipitation sufficiently saturates the soil (vernal pools and bogs). Inland wetlands include marshes and wet meadows dominated by herbaceous plants, swamps dominated by shrubs, and wooded swamps dominated by trees.

Certain types of inland wetlands are common to particular regions of the country:

- wet meadows or wet prairies in the Midwest
- prairie potholes of Nebraska

Natural Resources and the Environment

Many of these wetlands are seasonal (dry one or more seasons every year). The quantity of water present and the timing of its presence in part determine the functions of a wetland and its role in the environment. Even wetlands that appear dry at times for significant parts of the year - such as vernal pools - often provide critical habitat for wildlife adapted to breeding exclusively in these areas.

The federal government protects wetlands through regulations (like Section 404 of the Clean Water Act), economic incentives and disincentives (for example, tax deductions for selling or donating wetlands to a qualified organization and the "Swampbuster" provisions of the Food Security Act), cooperative programs, and acquisition (for example, establishing national wildlife refuges). Beyond the federal level, a number of states have enacted laws to regulate activities in wetlands, and some counties and towns have adopted local wetlands protection ordinances or have changed the way development is permitted. Few states, however, have laws specifically regulating activities in inland wetlands, although some states and local governments have non-regulatory programs that help protect wetlands.

Partnerships to manage whole watersheds have developed among federal, state, tribal, and local governments; nonprofit organizations; and private landowners. The goal of these partnerships is to implement comprehensive, integrated watershed protection approaches. A watershed approach recognizes the inter-connection of water, land, and wetlands resources and results in more complete solutions that address more of the factors causing wetland degradation.

The government achieves the restoration of former or degraded wetlands under the Clean Water Act Section 404 program as well as through watershed protection initiatives. Together, partners can share limited resources to find the best solutions to protect and restore America's natural resources. While regulation, economic incentives, and acquisition programs are important, they alone cannot protect the majority of our remaining wetlands. Education of the public and efforts in conjunction with states, local governments, and private citizens are helping to protect wetlands and to increase appreciation of the functions and values of wetlands. The rate of wetlands loss has been slowing, but we still have work to do. You can be a part. Approximately 75 percent of wetlands are privately owned, so individual landowners are critical in protecting these national

treasures.

Wetlands play an important role in the ecology of Washington County. Wetlands are home to many species of wildlife, many of which live only in wetland areas. Wetlands also provide an important service to nearby areas by holding and retaining floodwaters. These waters are then slowly released as surface water, or are used to recharge groundwater supplies. Wetlands also help regulate stream flows during dry periods.

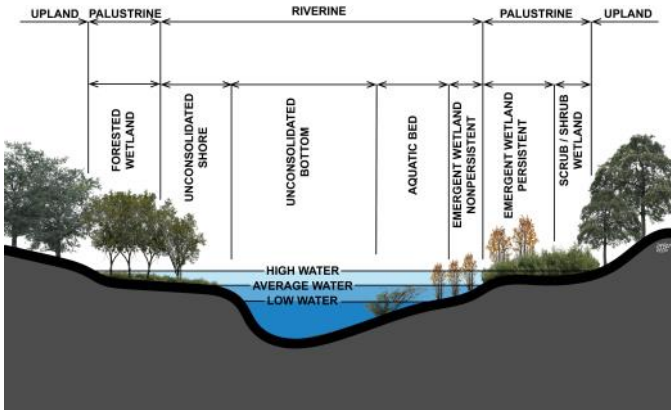
The U.S. Fish and Wildlife Service (FWS) produce information on the characteristics, extent, and status of the Nation's wetlands and deep-water habitats. This information has been compiled and organized into the National Wetlands Inventory (NWI).

Wetlands are categorized in several classifications, each more detailed and specific than the previous. The NWI uses five systems; marine, estuarine, riverine, lacustrine, and palustrine. Within each system, there are subsystems, classes, subclasses, and dominance types to describe different wetland characteristics. The system classification refers to wetlands sharing similar hydrologic, geomorphologic, chemical, or biological factors. The following are definitions and examples of three of the five systems used to describe wetlands. The Marine and Estuarine wetland systems are located in and near the open ocean; therefore, they do not occur in Nebraska. Further information, through NWI, on specific classifications is available.

Washington County experiences each of these three other wetland systems. The majority of the wetlands in the county occur, mostly along the Missouri River. However, there are smaller wetland pockets scattered around Washington County.

Figures 8.1, 8.2, and 8.3 depict common examples of the riverine, lacustrine, and palustrine wetlands, respectively. Figure 8.4 shows the occurrence of wetlands in Washington County. These figures were produced by the United States Fish and Wildlife Service, and are taken from their 1979 publication entitled "Classification of Wetlands and Deepwater Habitats of the United States", some enhancement was completed in order to place accents on key areas.

FIGURE 8.1: RIVERINE WETLAND SYSTEM

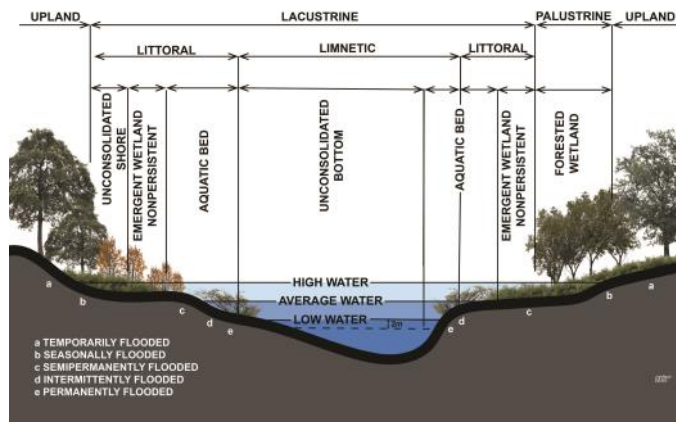


Source: National Wetlands Inventory

Figure 8.1 shows the riverine system includes all wetlands that occur in channels, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean derived salts in excess of 0.5%. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water. Therefore, water is usually, but not always, flowing in the riverine system.

Springs discharging into a channel are also part of the riverine system. Uplands and palustrine wetlands may occur in the channel, but are not included in the riverine system. Palustrine Moss-Lichen Wetlands, Emergent Wetlands, Scrub-Shrub Wetlands, and Forested Wetlands may occur adjacent to the riverine system, often in a floodplain.

FIGURE 8.2: LACUSTRINE WETLAND SYSTEM



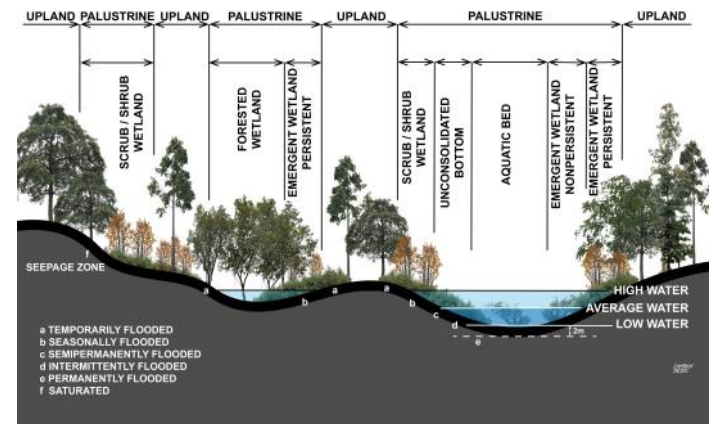
Source: National Wetlands Inventory

The Lacustrine System includes all wetlands with all of the following characteristics: (1) situated in a

topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents, emergent moss or lichens with greater than 30% area coverage; and (3) total area exceeds 20 acres. Similar wetland areas totaling less than 20 acres are also included in the Lacustrine System if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary, or if the water depth in the deepest part of the basin exceeds 6.6 feet (2 meters) at low water.

The Lacustrine System includes permanently flooded lakes and reservoirs (e.g. Lake Superior), intermittent lakes (e.g. playa lakes), and tidal lakes with ocean-derived salinities below 0.5% (e.g. Grand lake, Louisiana). Typically, there are extensive areas of deep water and there is considerable wave action. Islands of Palustrine wetlands may lie within the boundaries of the Lacustrine System.

FIGURE 8.3: PALUSTRINE WETLAND SYSTEM



Source: National Wetlands Inventory

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 20 acres; (2) lacking active wave-formed or bedrock shoreline features; (3) water depth in the deepest part of basin less than 6.6 feet (2 meters) at low water; and (4) salinity due to ocean-derived salts less than 0.5%.

The Palustrine System was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States. It also includes the small, shallow, permanent, or intermittent

Natural Resources and the Environment

water bodies often called ponds. These wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers.

SOIL FORMATION AND CLASSIFICATION

The general soil map shows broad areas having a distinctive pattern of soils, relief, and drainage. Each map unit, or soil association, on the general soil map is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. The associations are named for the major soils. The soils making up one association can occur in other associations but in a different pattern.

Because of its scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one soil association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

(The following information has been inserted directly from the Washington County Solis Survey dated September 1964)

SOIL ASSOCIATIONS

1. Cass-Leshara association

Sandy to silty soils of the bottom lands of the Elkhorn River

This association is in the bottom lands of the Elkhorn River, along the southwestern edge of the county. It makes up about 2 percent of the county. The level soils along the stream have developed in water-deposited material, or alluvium, and the soils along the gentle slopes into the valley have developed in slope wash, or alluvium and colluvium. Most of the soils in this association are nearly level; however, those next to the stream channel and along the entrenched drainageways are on short, steep slopes.

The Cass, Leshara, and Judson soils are dominant in this association. Minor soils are the Lamoure, McPaul, Sarpy, Rauville, and a few others. The soils of this association are mostly noncalcareous to a depth of 3 feet or more.

The Leshara and Judson are deep, dark silty soils that are commonly stratified. The Leshara soils are on im-

perfectly drained bottom lands. The Judson and McPaul soils are on better drained areas near the outer edge of the valley. The Cass soils are the most extensive in this association and occur with the Leshara soils. They have a dark, thick, loamy to sandy surface layer over a moderately sandy subsoil. The Sarpy soils are along the river channel and have a loamy to very sandy surface layer and a sandy subsoil.

The poorly drained, frequently flooded lowlands that are along the channel are not suitable for cultivation. They are loamy to clayey and are included with the Rauville soils. There are a few acres of alkali soils south of Arlington, across the Elkhorn River in the southwestern part of the county. More of those soils are in Dodge County to the south and west.

Most soils in this association are cultivated. They respond well to fertilizer and under good management produce high yields of corn, soybeans, sorghum, and alfalfa. Water management, which includes protection of the land from overflow and stabilization of the water table, is the main problem. In dry periods this excess water may be beneficial to crops. Water for irrigation is available in the alluvial gravel under the soils in this association and is used to stabilize production of nursery crops and other crops that have a high value per acre.

Farms that are on predominantly deep, level soils are of the cash-grain type; those that include wet or rough land are of the grain-livestock type. Roads parallel the river between farmsteads; they follow section lines in only a few places.

2. Moody-Belfore association

Clayey to silty soils of the rolling loess uplands west of Bell Creek.

The soils in this association make up about 17 percent of the county. They are along the west side of the county, west of Bell Creek. They have developed in loess in the uplands and on the Bell Creek terrace. The soils along the lower slopes and upland drainageways have developed in the alluvial and colluvial material brought down from the uplands.

The major soils in this association are the Belfore, Moody, and Judson. The Luton, Nora, Crofton, and Sharpsburg are important soils in the area where they occur.

Figure 7.4: Wetlands Map

Figure 7.5: Soils Association Map

The Belfore soils are deep, dark, moderately fine textured soils on the nearly level ridgetops. The surface layer is a dark, granular silty clay loam over a somewhat browner, finer textured, subangular blocky subsoil. The Belfore soils are noncalcareous to a depth below 5 feet.

The Moody soils are on gently rolling to rolling slopes that are no more than moderately eroded. They are similar to the Belfore soils but have less clay in the subsoil and are calcareous higher in the profile.

The deep, dark silty Judson soils are around the heads of drainageways and on the lower slopes.

The Nora are the dominant soils on the rolling to steep slopes that are moderately to severely eroded. They are lighter colored and less clayey than the Moody soils, and lime is usually within 18 inches of the surface.

The silty, calcareous Crofton soils are in the areas that slope into the Elkhorn River bottom and on the severely eroded points and banks along drainageways throughout the uplands. They have a thin, dark surface layer where they have remained in grass or trees. In cultivated areas the dark surface layer has usually been removed.

The deep, dark, moderately fine textured Lamoure and Colo soils are along the drainageways of the nearly level uplands. The Sharpsburg soils are on the terraces along Bell Creek. These soils, in color and structure, are similar to the Belfore but are less clayey throughout the profile. The deep, dark clayey soils of the Luton series are on the bottom lands along Bell Creek. In places they are calcareous and slowly permeable.

Most of this association is cultivated, and yields of all the crops commonly grown in the area are good. In years of subnormal rainfall, a small acreage of nursery crops on the Bell Creek terrace is irrigated.

Occasional flooding and slow permeability are problems on the Luton soils along Bell Creek. Runoff and erosion are the major problems on the rolling uplands where the Moody and Nora soils occur. Water conservation in dry periods and water disposal in periods of excess moisture are the major problems on the Belfore soils.

Most farms in this area are of the cash-grain type; some are of the livestock type. Good gravel roads are on most section lines.

3. Sharpsburg-Marshall association

Silty to Clayey soils of the nearly level to rolling loess uplands east of Bell Creek.

This association is in the center of the county east of Bell Creek; it includes the Papillion Creek drainage area, as well as a narrow band of sloping land that drains toward the Elkhorn River and Bell Creek. It makes up about 35 percent of the county.

The soils have developed in loess on the nearly level uplands and upland slopes. Along the lower slopes and along the drainageways from the uplands, the soils have developed in alluvial-colluvial deposits brought down from the slopes.

The main soils are the Sharpsburg of the nearly level uplands, the Sharpsburg and Marshall soils on the gently rolling to rolling slopes, and the Nora soils of the steep or eroded slopes of the uplands. These soils have developed in loess. Other soils included are the Crofton on the steep, severely eroded points and shoulders of slopes, the Judson on the lower slopes and along small upland drainageways, and the Lamoure and Colo along larger drainageways. Figure 8.6 shows the pattern of the soils in the Sharpsburg-Marshall association.

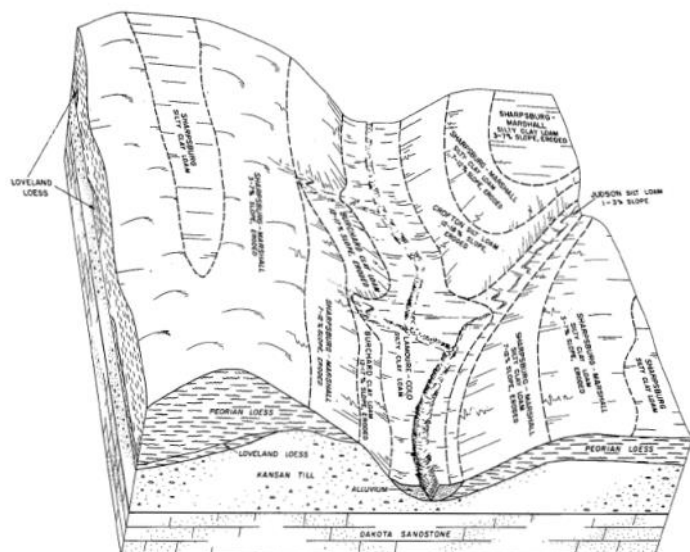
The Sharpsburg soils are deep, dark, moderately fine textured soils. They are well drained and noncalcareous. The Sharpsburg and Marshall soils have similar profiles. The Nora soils have lime within 2 feet of the surface and have lost much of the surface soil.

Small, scattered areas of Crofton soils occur on the steepest slopes. Their dark surface layer is thin or absent, and lime is usually at or near the surface. The nearly level to gently sloping Judson soils are deep, dark, and medium to moderately fine textured. They show little profile development and have little or no lime within the profile. The Lamoure and Colo are alluvial soils along the larger streams. They are deep, dark, and nearly level. They have a moderately fine textured subsoil that commonly is finer textured with depth. In some areas lime is present in the subsoil and substratum.

Most of this association is cultivated, and the areas on nearly level to moderate slopes are among the most productive in the county. Most farms are of the

Natural Resources and the Environment

cash-grain type; some are of the livestock type.



Good gravel roads are on most section lines.

FIGURE 8.6: SHARPSBURG-MARSHALL ASSOCIATIONS

4. Monona-Crofton association

Silty soils of the rolling hills and bluffs west of the Missouri River bottom lands.

This association consists of deep silty soils that have developed in loess on the eastern edge of the uplands. About 30 percent of the county is in this association. This association comprises a rolling to hilly area that is dissected by numerous streams that drain to the east into the Missouri River (Figure 8.7). The streams in this area have a grade that is much steeper than that of the streams in other areas of the uplands. All start at about the same elevation in the uplands; those in this part of the county empty in the Missouri River in 10 to 15 miles, and those in the rest of the county lose the same elevation in two to three times this distance. Because of the steep grade, the stream channels in this area are 20 to 50 feet deeper than they were before channels on the bottom lands were straightened.

Limestone and shale are exposed and quarried in the southeastern corner of the county at the base of the Missouri River bluffs. Soils developed in weathered products of these rocks are not in large enough areas to be mapped separately.

Moderately fine textured soils that have developed from glacial till of Kansan age occur in some places on the lower slopes along the larger streams. Some of the largest areas are along New York Creek. Soils that have developed in loess cover the ridgetops, high

terraces, and most of the slopes. Along the streams and drainageways are soils that have developed in alluvial and colluvial materials.

The deep, medium-textured Monona and Crofton soils are the most extensive and important ones in this association. Both of these soils have developed in loess and are well drained and permeable. The surface layer is neutral to alkaline in reaction and becomes more alkaline with depth. These soils commonly are calcareous below 5 feet; in places on steep or eroded slopes, they are calcareous at the surface.

The Burchard and Steinauer are less extensive soils that have developed in glacial till. They are on the lower slopes that are rolling to steep. They are moderately fine textured, have moderate profile development, and are calcareous in the lower profile. The Judson and Kennebec soils occur on the colluvial slopes and along the upland drainageways. They are deep, dark, and medium textured and are usually neutral throughout the profile.

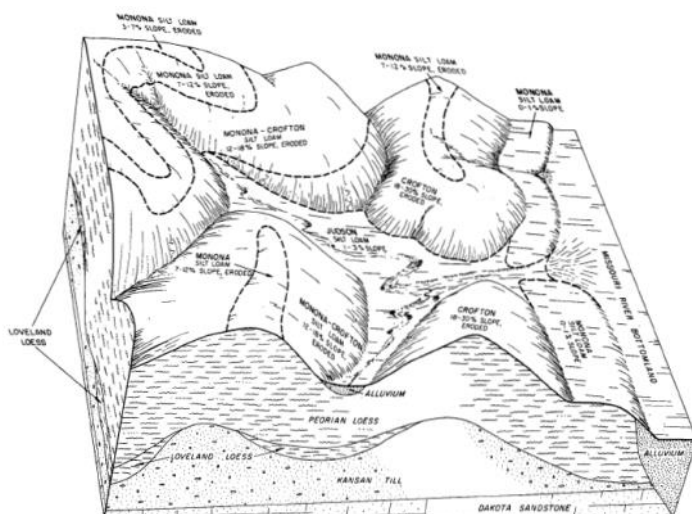


FIGURE 8.7: MONONA-CROFTON ASSOCIATIONS

Most of this association is cultivated, but it has more land in grass and trees than any other soil association in the county. The more rolling areas have lower yields than other parts of the county and have more of the acreage in alfalfa, rotation hay, and pasture.

5. Lutin-Volin association

Clayey to silty soils of the high bottom lands of the Missouri River.

The soils in this association are part of a band of alluvial soils that extend along the eastern edge of the county. These soils are nearly level and have developed in older clayey and silty alluvium next to the terrace. They are about 10 to 30 feet above the frequently flooded, low bottom lands that are along the river channel. This association makes up about 8 percent of the county. The relationship of the soils of the high bottom lands to those of the low bottom lands is shown in Figure 8.8.

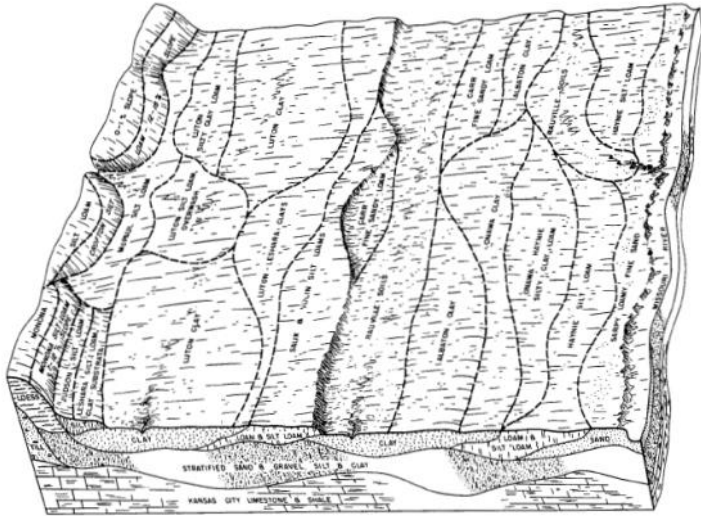


FIGURE 8.8: LUTON-VOLIN & ALBATON-HAYNIE ASSOCIATIONS

Because of the nearly level slopes, all the soils in this association have slow surface drainage. The Luton soils have a fine-textured subsoil and substratum and a medium-to fine-textured surface layer. They are slowly permeable and neutral in reaction. The Vonn soils are deep, Clark, medium textured, and well drained to moderately well drained. They are more immature than the Salix soils, with which they are associated. The Salix soils occur where a natural levee of silty material was built up adjacent to the low bottom lands. These are deep, dark, well-drained silty soils; lime has been leached from their surface soil into the subsoil or below it. The Leshara and McPaul are less extensive soils in this area. They are deep, medium textured, and somewhat immature.

Almost all of the soils in this association are cultivated. Corn, soybeans, sorghum, and alfalfa produce well under good management. Cash-grain farming is the most common type. A few farmers irrigate some of the clay soils planted to seed corn or other special crops to offset the effects of midsummer drought. Gravel roads extend north and south on most section lines, but

only a few roads near towns extend west out of the valley.

6. Albaton-Haynie association

Clayey to sandy soils of the bottom lands of the Missouri River.

This association consists of a band of soils, $\frac{1}{2}$ to 2 miles wide, that developed in recent alluvium along the eastern edge of the county. The soils are nearly level, except for those on the short slopes along old channels and drainage-ways and on a few ridges in the sandy areas. They make up 8 percent of the county.

The Missouri River bottom lands have always been considered two separate areas by the people of the county. Areas of the Luton-Volin association were called the high bottom, and those of the Albaton-Haynie association were called the land below the high bank. The low-lying land has always been subject to seasonal flooding and rapid channel changes. Old pile dikes at a considerable distance from the channel show attempts to stabilize the channel in the 1930's. Then the land was used on a temporary basis. Small fields, 10 to 40 acres in size, were cleared and farmed between floods. The farmsteads were small and frequently were makeshift. A boat for quick exit was a common sight.

From 1940 to 1952, floods caused losses of crops, equipment, and livestock so frequently that people stopped trying to keep the fields cleared, and trees and brush soon covered most of the low bottom lands. The flood of April 1952 was the most extensive in recent years. All of the low bottom lands and most of the high bottom lands were under water. Local deposits of sediment ranged from 1 to several feet thick. After the Fort Randall Dam and other dams in the Dakotas were completed, the probability of flooding was reduced, and the low bottom lands are again being cleared and conditioned for cropping. Large machines are being used to clear the land that a short time ago was covered by trees more than a foot in diameter.

This association is similar in size to the Luton-Volin association. The Albaton, Haynie, and Onawa are the most extensive soils; smaller areas of Rauville, Sarpy, and Carr soils occur. All of these soils are stratified, relatively light

Natural Resources and the Environment

colored, immature, imperfectly drained, and calcareous. The Albaton and Onawa soils have developed in the fine-textured sediment. The Haynie, Carr, and Sarpy soils have developed in the coarse-textured sediment. The Rauville soils are in the low, poorly drained areas not suitable for cultivation.

Much of the land in this association is cultivated and produces satisfactory yields if fertilized and well managed. Wet and irregular areas along channels are in trees and brush. These areas are being developed for pasture.

There are fewer farmsteads here than in the rest of the county. Livestock and some cash-grain farming are the most common. Most roads are on section lines, but only those needed to reach the farmsteads and fields have been regraded.

SOIL SUITABILITY

The characteristics of soils play a major role in determining the potential compatibility of certain uses on the land. The ability to absorb certain liquids such as water and wastewater are different for certain types of soils. In addition, how sensitive an area is to erosion or how shallow the soils are in an area can have a major impact on the ability to develop a specific area of Washington County. These conditions and how they factor into a soil's ability to support certain types of uses is referred to as limitations.

Finally, if a soil has some level of limitation, it does not mean that different uses cannot be constructed in those soils. However, the key focus needs to be on the type of special engineering solutions needing to be implemented in order to overcome these specific soil limitations.

SOIL LIMITATIONS

The interpretations are based on the engineering properties of soils, on test data for soils in the survey area and others nearby or adjoining, and on the experience of engineers and soil scientists familiar with the soils of Washington County.

Soil limitations are indicated by the ratings Not Limited, Somewhat Limited, and Very Limited.

Not Limited means soil properties are generally favorable for the stated use, or in other words, that limitations are minor and easily overcome.

Somewhat Limited means some soil properties are unfavorable but can be overcome or modified by special planning and design.

Very Limited means soil properties may be so unfavorable and difficult to correct or overcome as to require various degrees of soil reclamation, special designs, or intensive maintenance.

Dwellings without Basements

Figure 8.9 shows the soil suitability conditions for constructing dwellings without a basement (slab on-grade construction). In addition Table 8.1 provides the suitability by soil types and the specific conditions impacting the soil.

Very Limited Conditions

Based upon the Table 8.1, a majority of the soils in Washington County are considered Very Limited for a Dwelling Unit without a Basement. There are five major conditions impacting the soils (not all four are present in any one soil type). The conditions present in the different soils are:

- Flooding
- Depth to saturation zone
- Slope
- Depth to Rock
- Shrink-Swell

Again, these conditions may or may not eliminate the ability of a land owner to build a slab-on-grade dwelling unit, but specific conditions will need to be engineered to overcome to eliminate potential problems in the future.

Somewhat Limited Conditions

Besides the Severe soils, there are some soils considered Somewhat Limited which is less of an issue when developing. The conditions that are creating the Somewhat Limited classification are:

- Shrink-swell
- Slope

Dwellings with Basements

Figure 7.11 shows the soil suitability conditions for constructing Dwellings with basements. In addition Table 7.1 provides the suitability by soil types and the specific conditions impacting the soil.

Very Limited Conditions

Based upon the Table 7.1, the Very Limited conditions are very similar to Dwellings without Basements. As noted above, a majority of the

soils in Washington County are considered Very Limited for a Dwelling Unit with a Basement. There are five major conditions impacting the soils (not all five are present in any one soil type). The conditions present in the different soils are:

- Flooding
- Depth to saturated zone
- Slope
- Shrink-Swell
- Depth to Rock

Again, these conditions may or may not eliminate the ability of a land owner to build a dwelling unit, but specific conditions will need to be engineered to overcome to eliminate potential problems in the future.

Somewhat Limited Conditions

There are fewer Somewhat Limited rated soils having fewer issues when developing. The conditions creating the Somewhat Limited classification are:

- Shrink-swell
- Slope
- Depth to Rock

Septic Tank and Absorption Fields

Figure 7.13 shows the soil suitability conditions for placement of a septic tank and absorption field in Washington County. Table 7.1 provides the suitability by soil types and the specific conditions impacting the soil.

Very Limited Conditions

Based upon the Table 7.1, there are seven conditions impacting the use of septic tanks and absorption fields in Washington County. The major conditions impacting the soils are:

- Flooding
- Depth to saturated zone
- Poor Filter
- Slow water movement
- Depth to Rock
- Slope
- Seepage

Again, these conditions may are may not eliminate the ability of a land owner to use a septic tank and absorption field but specific conditions will need to be engineered to overcome to eliminate potential problems in the future.

Somewhat Limited Conditions

The issues present creating Somewhat problems for

septic tanks are:

- Slow water movement
- Depth to saturated zone
- Flooding
- Slope
- Depth to Rock

Sewage Lagoons

Figure 7.14 shows the soil suitability conditions for placement of Sewage Lagoons in Washington County. Table 7.1 provides the suitability by soil types and the specific conditions impacting the soil.

Very Limited Conditions

Based upon the Table 7.1, there are six conditions impacting the use of sewage lagoons in Washington County. The major conditions impacting the soils are:

- Flooding
- Depth to saturated zone
- Seepage
- Ponding
- Slope
- Depth to rock

Again, these conditions may are may not eliminate the ability of a land owner to use a sewage lagoon but specific conditions will need to be engineered to overcome to eliminate potential problems in the future.

Somewhat Limited Conditions

Besides the Very Limited soils, there are some soils considered Somewhat Limited which is less of an issue when developing. The conditions that are creating the Somewhat Limited classification are:

- Seepage
- Slope
- Depth to saturated zone
- Flooding

Again, these conditions may need special engineering to overcome to eliminate potential problems in the future.

Natural Resources and the Environment

TABLE 8.1: SOIL PROPERTIES BY TYPE AND USE

Soil Symbol/Soil Name	Dwellings without Basements		Dwellings with Basements		Septic tank and absorption fields		Sewage Lagoons	
	Suitability	Conditions	Suitability	Conditions	Suitability	Conditions	Suitability	Conditions
7710 Albaton	2	1,2,7	2	1,2,7	2	1,2,4,6	2	1,2,6
7711 Albaton	2	8,1,2,7	2	8,1,2,7	2	1,8,2,4,6	2	8,1,2,6
6603 Alcestor	1	7,8,5	1	7,5	2	4,5,2,3	1	5
6505 Belfore	2	7,8,2	1	7	2	4,8,2	0	-
6628 Belfore	2	7,8,2	1	7	2	4,8,2	0	-
7210 Burchard-Contrary-Steinauer	1	5,7	1	5,7	2	4,5	2	5
7228 Burchard	1	5,7	1	7,5	2	4,5	2	5
7266 Burchard-Steinauer	2	1	2	5,7	2	4,5	2	5,6
7767 Blyburg	2	1,2,7	2	1,2,7	2	6,1,2,4	2	6,2,1
3521 Cass	2	1	2	1,2	2	1,6,3,2	2	1,6,2
8436 Cass	2	1	2	1	2	1,6,4	2	1,6
6324 Coleridge	2	1,7,2	2	1,2,7	2	2,4,1,6	2	1,2,6
8153 Contrary-Marshall	1	7,5	1	7,5	2	4,5	2	5,6
8155 Contrary-Monona	1	7,5	1	7,5	2	4,5	2	5,6
8157 Contrary-Monona-Ida	1	5,7	1	5,7	2	4,5,6	2	5,6
7779 Cooper	2	1,7,2	2	1,2,7	2	2,4,1	2	2,1,6
6681 Crofton	2	5,7	2	5	2	5,4,6,3	2	5,6
6686 Crofton	2	5,7	2	5	2	5,4,6,3	2	5,6
6860 Crofton	1	5,1,2	2	5	1	5,4	2	5,6
9903 Fluvaguents	2	8,1,2	2	8,1,2	2	1,8,2,3,6	2	8,1,6,2
9906 Fluvaguents	2	5,8	2	8,1,2	2	1,8,2,4	2	8,1,2
6327 Fontanelle	2	8,1,2	2	1,2	2	1,2,4,3,6	2	8,1,2,6
7780 Fomey	2	1,2,7	2	1,2,7	2	2,4,1	2	2,6,1
8485 Gilliam-Eudora	2	1,7,2	2	1,2,7	2	1,2,4,6,3	2	1,2,6
7703 Grable	2	1,7,2	2	1,2,7	2	1,3,6,2,4	2	1,6,2
7741 Haynie	2	1,7,2	2	1,2,7	2	1,4,3,6,2	2	1,6,2
8008 Ida	2	5,7	2	5,7	2	5,4	2	5,6
8010 Ida	1	5,7	1	5	2	4,5	2	5,6
8012 Ida-Pohocco-Monona	2	5	1	5	2	5,4	2	5,6
6456 Inglewood	2	1,2	2	1,2	2	1,3,6,4	2	1,6,2
7234 Judson	1	7	1	7	2	4,1,2	1	5
7235 Judson-Nodaway	1	7,5	1	7,5	2	4,1,2,5	2	1,6,2
7050 Kennebec	2	1,2	2	1,2	2	1,2,4	2	1,6,2
3642 Kezan	2	1,2,7	2	1,2,7	2	1,2,4	2	1,2,6
3643 Kezan-Kennebec	2	1,2,7	2	1,2,7	2	1,2,4	2	1,2,6
7787 Luton	2	1,7,2	2	1,2,7	2	1,2,4	2	1,2
7791 Luton	2	1,2,7	2	1,2,7	2	2,4,1	2	2,1
8016 Marshall	1	7	1	7	2	4,8,2	0	-
8019 Marshall	1	7	1	7	2	4	1	5
8032 Marshall-Pohocco	1	7,5	1	7,5	2	4	2	5,6
8035 Marshall-Contrary	1	7	1	7	2	4	1	5,6
8076 Monona	0	-	0	-	1	4	1	6,5
8083 Monona	0	-	0	-	1	4	1	6
8084 Monona	0	-	0	-	1	4	1	6,5

Legend for Table 7.1

Suitability	Conditions
0 = Not Limited	1 = Flooding
1 = Somewhat Limited	2 = Depth to saturated zone
2 = Very Limited	3 = Filtering Capacity
	4 = Slow water movement
	5 = Slope
	6 = Seepage
	7 = Shrink-swell
	8 = Ponding

Natural Resources and the Environment

Soil Symbol/Soil Name	Dwellings without Basements		Dwellings with Basements		Septic tank and absorption fields		Sewage Lagoons	
	Suitability	Conditions	Suitability	Conditions	Suitability	Conditions	Suitability	Conditions
8093 Monona-Ida	2	5	2	5	2	5,4	2	5,6
8097 Monona -Pohocco	0	-	0	-	1	4	2	5,6
8100 Monona-Pohocco-Ida	2	5	2	1,2	2	5,4	2	5,6
6811 Moody	1	7	1	7	2	4,8,1,2	1	6,5
7796 Merville	2	1,7	2	1,7,2	2	4,2,1	1	6,1,2
8108 Napier-Nodaway-Gullied	1	7	0	-	1	4	2	5,6,1,2
6756 Nora	1	5,7	1	5,7	1	4,5	2	5,6
6774 Nora-Crofton	1	5,7	1	5,7	1	5,4	2	5,6
7874 Omadi	2	1,7	2	1,2,7	1	2,4,1	1	6,1,2
7763 Onawa	2	1,7,2	2	1,2,7	2	1,2,4,3,6	2	1,2,6
7880 Onawa	2	1,7,2	2	1,2,7	2	1,2,4,6	2	1,2,6
7885 Onawa-Haynie	2	1,7,2	2	1,2,7	2	1,2,4,6,3	2	1,2,6
7888 Onawet	2	1,2,7,8	2	8,1,2,7	2	1,8,2,4,6	2	8,1,6,2
7802 Percival	2	1,7,2	2	1,2,7	2	1,2,4,6	2	1,6,2
8563 Platte	2	1,2	2	1,2	2	1,2,3,6	2	1,6,2
8566 Platte-Inglewood-Barney	2	1,2,7	2	1,2	2	1,2,3,6	2	1,6,2
8136 Pohocco-Ida	1	5,7	1	5,7	1	5,4	2	5,6
8138 Pohocco-Ida-Monona	1	5,7	1	5	1	5,4	2	5,6
8142 Pohocco-Monona	1	5,7	1	5	1	5,4	2	5,6
7808 Salix	2	1,7	2	1,2	2	4,2,1,6	1	6,1,2
7080 Sarpy	2	1	2	1,2	2	1,6,3,2	2	1,6,2
7083 Sarpy	2	1	2	1,2	2	1,6,3,2	2	1,6,2
6385 Shell	2	1	2	1	2	1,4	2	1,6
7820 Wathena	2	1	2	1,2	2	1,2,4,3	2	1,6,2
7821 Wathena	2	1	2	1,2	2	2,4,1	2	6,1,2
7099 Zook	2	1,2,7	2	1,2,7	2	1,2,4,6	2	1,2,6

Legend for Table 7.1

Suitability	Conditions
0 = Not Limited	1 = Flooding
1 = Somewhat Limited	2 = Depth to saturated zone
2 = Very Limited	3 = Filtering Capacity
	4 = Slow water movement
	5 = Slope
	6 = Seepage
	7 = Shrink-swell
	8 = Ponding

Flooding is defined as soils located in areas which are prone to flooding.

Depth to saturated zone refers to soils which do not drain well or have a low permeability. This conditions creates an above average existence of wet soils.

Poor Filter means soils with rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Slow water movement means soils that do not allow reasonable downward movement of water.

Slope means the inclination of the land surface from the horizontal. Within Washington County the class of slopes are:

Nearly level	0 to 1 percent
	0 to 2 percent

Very gently sloping
Gently sloping

Strongly sloping

Moderately sloping

Steep

1 to 3 percent
2 to 6 percent
3 to 6 percent
6 to 9 percent
6 to 11 percent
9 to 20 percent
11 to 15 percent
15 to 30 percent

Ponding means standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Seepage means the movement of water through the soil. Seepage adversely affects the specified use.

Shrink-swell means the shrinking of soil when dry and swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Natural Resources and the Environment

OTHER FACTORS IMPACTING LAND USES

The previously discussed uses are typical to counties similar to Washington County. Earlier in this Chapter, the issue of wetlands was covered in some detail and is very closely associated with surface and groundwater. The following topics are greatly influenced by the type of soil and its location in an area. The following paragraphs will focus on Prime Farmland and Percent of Slope.

Prime Farmland

Prime farmland is directly tied to the specific soils and their composition. The map in Figure 7.15 identifies Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, and Not Prime Farmland.

According to the USDA, Prime farmland

“...is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It must also be available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.”

Soils determined to be prime farmland need to be protected throughout the rural areas of Nebraska. These soils are typically the best crop producing lands.

Percent of Slope

The slope of an area is critical to the ability of the area to be used for agricultural purposes to constructing homes and septic systems. Typically the steeper the slope the more difficult these issues become. However, lands with little to no slope can also create problems regarding the inability of water

to drain away from a site.

TABLE 7.2: DEFINITION OF SOIL SLOPES

Classes Simple Slopes	Complex Slopes	Slope Gradient Limits	
		Lower Percent	Upper Percent
Nearly level	Nearly level	0	3
Gently sloping	Undulating	1	8
Strongly sloping	Rolling	4	16
Moderately sloping	Hilly	10	30
Steep	Steep	20	60
Very steep	Very steep	>45	

Figure 7.16 shows the percent slope for Washington County. Based upon the map, the only areas with steep slopes is on the eastern edge near the Missouri River. There are small pockets of steep slopes scattered throughout the county.

Based upon Table 7.1 slope is factor in a few soils/locations in the county. In a number of situations, any soil conditions based upon slope could likely be engineered to become more compatible. However, it is important to involve an engineer, geologist, or soil scientist in the issue in order to make the correct modifications.



FIGURE 7.10: SOIL SUITABILITY MAP - DWELLINGS WITHOUT BASEMENT

FIGURE 7.11: SOIL SUITABILITY MAP - DWELLINGS WITH BASEMENT

FIGURE 7.12: SOIL SUITABILITY MAP - SEPTIC TANK ABSORPTION FIELDS

FIGURE 7.13: SOIL SUITABILITY MAP - SEWAGE LAGOONS

FIGURE 7.14 PRIME FARMLAND

FIGURE 7.15 SLOPES

TABLE 7.3: PERMEABILITY BY SOIL TYPE

Soil Symbol/Soil Name	Depth (inches)	Permeability (inches/hour)
7710 Albaton	0-7	0.06-0.2
	7-47	0.06-0.2
	47-65	0.06-0.2
	65-80	0.06-0.2
7711 Albaton	0-7	0.06-0.2
6603 Alceator	0-8	0.2-0.6
	8-16	0.2-0.6
	16-23	0.2-0.6
	23-47	0.2-0.6
	47-67	0.2-0.6
	67-79	0.2-0.6
6505 Belfore	0-7	0.2-0.6
	7-15	0.2-0.6
	15-32	0.2-0.6
	32-47	0.2-0.6
6628 Belfore	0-7	0.2-0.6
	7-15	0.2-0.6
	15-32	0.06-0.6
	32-47	0.2-0.6
7210 Burchard-Contrary-Steinauer	0-6	0.2-0.6
	6-11	0.2-0.6
	11-25	0.2-0.6
	25-35	0.06-0.6
	35-47	0.2-0.6
	47-60	0.001-0.06
7228 Burchard	0-11	0.2-0.6
	11-42	0.2-0.6
	42-78	0.2-0.6
	78-93	0.2-0.6
7266 Burchard-Steinauer	0-11	0.2-0.6
	11-42	0.2-0.6
	42-78	0.2-0.6
	78-93	0.2-0.6
7767 Blyburg	0-11	0.2-0.6
	11-15	0.2-0.6
3521 Cass	0-12	0.2-0.6
	12-47	0.2-0.6
	47-60	0.2-0.6
8436 Cass	0-12	0.2-0.6
	12-38	0.2-0.6
	38-60	0.2-0.6
6324 Coleridge	0-7	0.2-2.0
	7-31	0.2-2.0
	31-47	0.2-2.0
	47-79	0.2-2.0
8153 Contrary-Marshall	0-7	0.2-2.0
	7-55	0.2-0.6
	55-80	0.2-2.0
8155 Contrary-Monona	0-7	0.2-2.0
	7-55	0.2-0.6
	55-80	0.2-2.0
8157 Contrary-Monona-Ida	0-7	0.2-2.0
	7-55	0.2-2.0
	55-80	0.2-2.0

Soil Symbol/Soil Name	Depth (inches)	Permeability (inches/hour)
7779 Cooper	0-16	0.2-0.6
	16-24	0.2-0.6
	24-33	0.06-0.2
	33-60	0.06-0.2
6681 Crofton	0-5	0.6-2.0
	5-11	0.6-2.0
	11-80	0.6-2.0
6686 Crofton	0-6	0.6-2.0
	6-12	0.6-2.0
	12-80	0.6-2.0
6860 Crofton	0-6	0.6-2.0
	6-12	0.6-2.0
	12-80	0.6-2.0
9903 Fluvaquents	0-5	0.6-2.0
	5-60	0.6-2.0
	60-80	0.6-2.0
	80-100	0.6-2.0
9906 Fluvaquents	0-5	0.2-2.0
	5-60	0.2-2.0
	60-80	0.2-2.0
	80-100	0.2-2.0
6327 Fontanelle	0-7	0.2-2.0
	7-13	0.2-2.0
	13-22	0.6-6.0
	22-41	0.6-6.0
	41-48	0.6-6.0
	48-60	0.2-0.6
6456 Inglewood	0-5	0.6-2.0
	5-40	0.6-2.0
	40-50	0.6-2.0
	50-80	0.6-2.0
7234 Judson	0-9	0.14-1.5
	9-22	0.14-1.5
	22-28	0.14-1.5
	28-35	0.14-1.5
	35-52	0.14-1.5
	52-79	0.14-1.5
7235 Judson-Nodaway Judson	0-30	0.2-0.6
	30-38	0.2-0.6
	38-60	0.2-0.6
	60-80	0.2-0.6
Nodaway	0-7	0.6-2.0
	7-100	0.6-2.0
7050 Kennebec	0-18	0.6-2.0
	18-41	0.6-2.0
	41-60	0.6-2.0
3642 Kezan	0-6	0.6-2.0
	6-13	0.2-2.0
	13-32	0.2-2.0
	32-60	0.2-2.0
3643 Kezan-Kennebec Kezan	0-6	0.2-2.0
	6-13	0.2-2.0
	13-32	0.2-2.0
	32-60	0.2-2.0
Kennebec	0-18	0.6-2.0
	18-41	0.6-2.0
	41-60	0.6-2.0
	60-100	0.6-2.0
7787 Luton	0-22	0.001-0.06

Soil Symbol/Soil Name	Depth (inches)	Permeability (inches/hour)
7791 Luton	0-12	0.06-0.2
	12-24	0.06-0.2
	24-33	0.06-0.2
	33-43	0.06-0.2
	43-50	0.06-0.2
	50-60	0.06-0.2
8016 Marshall	0-7	0.14-1.5
	7-22	0.14-1.5
	22-27	0.14-1.5
	27-59	0.14-1.5
	59-71	0.14-1.5
	71-79	0.14-1.5
8019 Marshall	0-7	0.14-1.5
	7-22	0.14-1.5
	22-27	0.14-1.5
	27-59	0.14-1.5
	59-71	0.14-1.5
	71-79	0.14-1.5
8032 Marshall-Pohocco Marshall	0-7	0.2-0.6
	7-18	0.2-0.6
	18-47	0.2-0.6
	47-68	0.2-0.6
Pohocco	0-6	0.6-2.0
	6-15	0.6-2.0
	15-28	0.6-2.0
	28-80	0.6-2.0
8035 Marshall-Contrary Marshall	0-7	0.2-0.6
	7-18	0.2-0.6
	18-47	0.2-0.6
	47-80	0.2-0.6
Contrary	0-7	0.2-2.0
	7-55	0.2-0.6
	55-80	0.4-2.0
8100 Monona-Pohocco-Ida Monona	0-7	0.6-2.0
	7-15	0.6-2.0
	15-30	0.6-2.0
	30-80	0.6-2.0
Pohoco	0-6	0.6-2.0
	6-15	0.6-2.0
	15-28	0.6-2.0
	28-80	0.6-2.0
Ida	0-6	0.6-2.0
	6-12	0.6-2.0
	12-80	0.6-2.0
6811 Moody	0-7	0.2-0.6
	7-12	0.2-0.6
	12-37	0.2-0.6
	37-46	0.2-0.6
7796 Merville	0-6	0.6-2.0
	6-27	0.6-2.0
	27-45	0.06-0.2
	45-60	0.06-0.2
8108 Napier-Nodaway Napier	0-8	0.14-1.5
	8-29	0.14-1.5
	29-48	0.14-1.5
	48-79	0.14-1.5
Nodaway	0-7	0.14-1.5

Natural Resources and the Environment

TABLE 7.3: PERMEABILITY BY SOIL TYPE

Soil Symbol/Soil Name	Depth	Permeability
6756 Nora	0-7	0.6-2.0
	7-17	0.6-2.0
	17-29	0.6-2.0
	29-79	0.6-2.0
6774 Nora-Crofton Nora	0-7	0.6-2.0
	7-17	0.2-0.6
	17-29	0.2-0.6
	29-79	0.2-0.6
Crofton	0-6	0.2-0.6
	6-13	0.2-0.6
	13-79	0.2-0.6
7874 Omadi	0-12	0.6-2.0
	12-20	0.6-2.0
	20-80	0.2-0.6
7763 Onawa	0-7	0.06-0.2
	7-22	0.06-0.2
	22-60	0.06-0.2
7880 Onawa	0-7	0.06-0.2
	7-22	0.06-0.2
	22-60	0.6-2.0
7885 Onawa-Haynie Onawa	0-7	0.06-0.2
	7-22	0.06-0.2
	22-60	0.6-2.0
Haynie	0-7	0.6-2.0
	7-60	0.6-2.0
7888 Onawet	0-7	0.06-0.2
	7-24	0.06-0.2
	24-39	0.6-2.0
	39-56	0.6-2.0
	56-80	6.0-20.0
7802 Percival	0-8	0.06-0.2
	8-24	0.06-0.2
	24-60	6.0-20.0
8563 Platte	0-5	0.6-2.0
	5-8	0.6-2.0
	8-16	0.6-2.0
	16-80	20.0-100.0
8566 Platte-Inglewood- Barney Platte	0-5	0.6-2.0
	5-8	0.6-2.0
	8-16	0.6-2.0
	16-80	20.0-100.0
Inglewood	0-5	0.6-2.0
	5-40	6.0-20.0
	40-50	6.0-20.0
	50-80	6.0-20.0
Barney	0-7	0.2-0.6
	7-10	0.6-2.0
	10-30	6.0-20.0
	30-80	20.0-100.0
8136 Pohocco-Ida Pohocco	0-6	0.6-2.0
	6-15	0.6-2.0
	15-28	0.6-2.0
	28-80	0.6-2.0
Ida	0-6	0.6-2.0
	6-12	0.6-2.0
	12-80	0.6-2.0

Soil Symbol/Soil Name	Depth	Permeability
8138 Pohocco-Ida-Monona Pohocco	0-6	0.6-2.0
	6-15	0.6-2.0
	15-28	0.6-2.0
	28-80	0.6-2.0
Ida	0-6	0.6-2.0
	6-12	0.6-2.0
	12-80	0.6-2.0
Monona	0-7	0.6-2.0
	7-15	0.6-2.0
	15-30	0.6-2.0
	30-80	0.6-2.0
8142 Pohocco-Monona Pohocco	0-6	0.6-2.0
	6-15	0.6-2.0
	15-28	0.6-2.0
	28-80	0.6-2.0
Monona	0-7	0.6-2.0
	7-15	0.6-2.0
	15-30	0.6-2.0
	30-60	0.6-2.0
7808 Salix	0-15	0.2-0.6
	15-25	0.2-0.6
	25-33	0.6-2.0
	33-60	0.6-2.0
7820 Wathena	0-6	2.0-20.0
	6-14	6.0-20.0
	14-21	6.0-20.0
	21-36	0.6-2.0
	36-58	6.0-20.0
	58-69	0.6-2.0
7821 Wathena	0-6	2.0-6.0
	6-14	6.0-20.0
	14-21	6.0-20.0
	21-36	0.6-2.0
	36-58	6.0-20.0
	58-69	0.6-2.0
7099 Zook	0-7	0.06-0.6
	7-41	0.06-0.6
	41-65	0.06-0.6
	65-79	0.06-0.6

Permeability

Permeability is defined in the Washington County Soil Survey as..."The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through saturated soils." Permeability is rated as:

Very slow	less than 0.06 inches
Slow	0.06 to 0.20 inches
Moderately slow	0.2 to 0.6 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Table 7.3 indicates the various permeability rates for each soil and at what depth the rating was taken. The Table indicates those considered to moderately rapid or higher in red. There are a number of soils in Washington County that can see a permeability of twenty inches per hour or more.

There are a number of specific uses that are not compatible for soils rated as Moderately rapid or higher. Soils rated at these levels will move contaminated materials much faster through the profile and into the regional water tables and aquifers. These uses will typically include anything dealing with animal or human sanitary waste systems.

Permeability, as with other soil factors, can be overcome with the proper engineering and construction techniques. Caution is a must when dealing with these conditions since the potential for contaminating an aquifer that feeds an entire area with water is a risk.

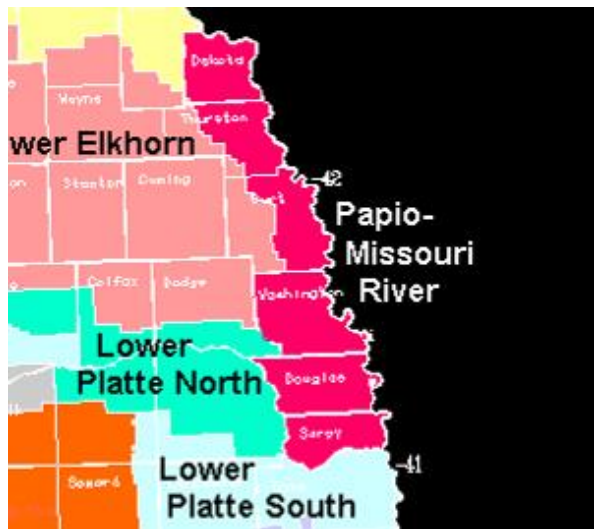
WATER AND THE IMPACT ON WASHINGTON COUNTY

Water, along with the soils are the two most restricting environmental conditions faced by Washington County. Damaging either one of these two elements will impact the residents of the county for years to come. As with the soil descriptions and conditions, it is important to discuss the water factors impacting Washington County during the present and coming planning period. Water in this section will apply to two topics, surface water and ground water.

Surface water applies to any water running across a surface and eventually runs into a minor drainage area, eventually ending up in a major waterway such as the Missouri River. However, a certain portion of surface water can and is absorbed by the soil in order to support plant life including corn, soybeans, and grass lawns.

Washington County lies in two distinct watersheds, these are defined and drainage areas controlled by the respective Natural Resource District. The two districts covering Washington County are the Lower Platte South Natural Resource District and the Nemaha Natural Resource District. The Lower Platte South is based in Lincoln, Nebraska, while the Nemaha is in Tecumseh, Nebraska.

FIGURE 7.16: WATERSHEDS AND THE NATURAL RESOURCE DISTRICTS



Source: www.lancaster.unl.edu

HYDRIC SOILS

Hydric soils are formed under conditions of saturation, flooding, or ponding. The process has to occur long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils along with hydrophytic vegetation and wetland hydrology are used to define wetlands. (USDA/NRCS, Fall 1996)

Figure 7.17 indicates where the hydric soils are located in Washington County. The soils are classified as the following:

- All Hydric,
- Not Hydric

Natural Resources and the Environment

The majority of the soils in Washington County are considered All Hydric or Partially Hydric.

GROUNDWATER

Groundwater refers to water found beneath the surface and includes smaller pockets of water as well as aquifers. This water source is where the residents of Washington County both city and rural, get their potable water for everyday living as well as the irrigation water for crops. The ability to find water meeting these specific needs is critical to the placement of certain uses. These specific needs include water quantity, water quality, and water pressure.

Use of Groundwater

Groundwater use in Washington County is in three forms; domestic and livestock supply, public water supplies, and irrigation. Each use is important to the overall viability of Washington County.

Domestic and Livestock supplies

Typically domestic and most livestock water supplies are obtained through the use of small diameter wells. Most of these wells are drilled only a few feet below the top of the water table, are low production wells, and equipped with electric powered jet or submersible pumps. The water yield of this type of well is usually no more than five gallons of water per minute.

Public water supplies

The public water supply is one of the most critical uses of groundwater resources. These supplies are used by the municipalities supplying water to its residents. In Washington County, all of the incorporated communities have a publicly owned water supply system. In addition, Washington County has three rural water districts located in the county.

The State of Nebraska places a great deal of value on these systems across the state. The value is so high that a Wellhead Protection Program is available to municipalities through Nebraska Department of Environmental Quality. This program allows the municipalities, after a series of prescribed steps are completed, to designate special areas around their wells and well fields in order to protect the quality and quantity of the water within the underlying aquifers. Development of a community wellhead protection plan can help communities receive financial assistance to protect and secure the source

of drinking water for the community.

Wellhead Protection

A Wellhead Protection Area is an delineated area indicating where a water source is located, as well as the area of travel for a specific well or well field. A wellhead protection area is important from the aspect that correctly implemented, the area will aid in protecting the water supply of a domestic well providing potable water to a community.

In Nebraska, the goal of the Nebraska Department of Environmental Quality's Wellhead Protection Program "...is to protect the land and groundwater surrounding public drinking water supply wells from Contamination". Within the NDEQ's program there are five steps to developing a wellhead protection area, which are:

1. Delineation
2. Contamination Source Inventory
3. Contaminant Source Management
4. Emergency, Contingency, and Long-term Planning
5. Public Education

The mapping process includes the use of computer modeling and other data. From this the NDEQ can generate a map indicating the wellhead Protection Area. However, delineating an area is not sufficient for protecting the groundwater around a public supply well, the governmental entity must adopt an ordinance in order to enforce the area and the regulations used to protect this water supply. Another way to officially regulate a wellhead protection area is for the community to create an interlocal agreement with the County to regulate these areas as part of the county comprehensive plan and zoning regulations.

Figure 7.18 shows the documented wellhead protection areas impacting Washington County. These are only the mapped areas, it is not clear if these communities have actually adopted the proper ordinances to fully protect the water supply.

Irrigation

Irrigation wells in Washington County has been a long standing practice. This process has become increasingly important to the production of crops within Washington County and Nebraska. The water demand for irrigation varies greatly from year to year and is dependent upon the amount

FIGURE 7.17: HYDRIC SOILS

FIGURE 7.18: WELLHEAD PROTECTION AREAS

FIGURE 7.19 FLOODPLAIN AND FLOODWAY MAP

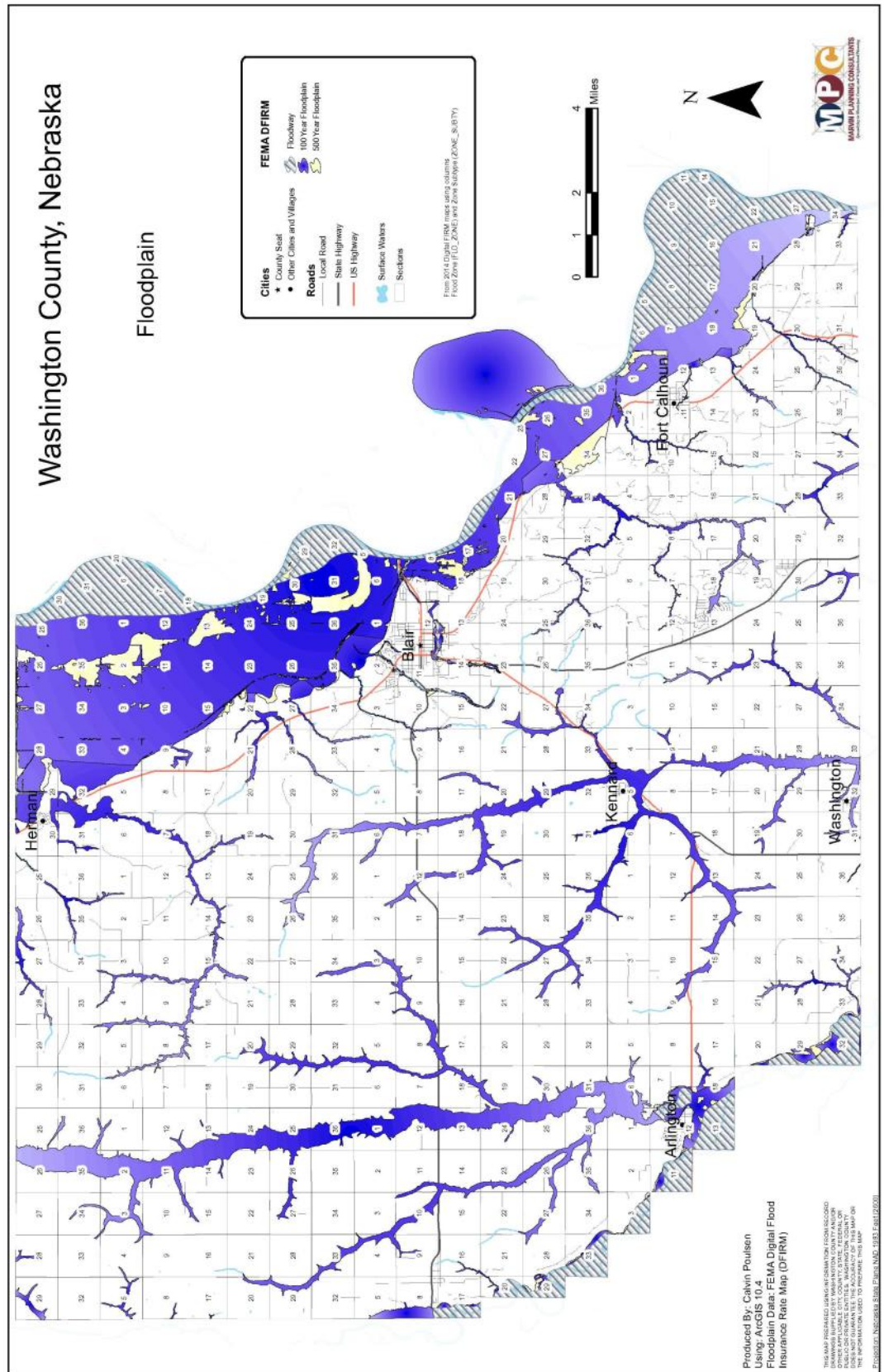
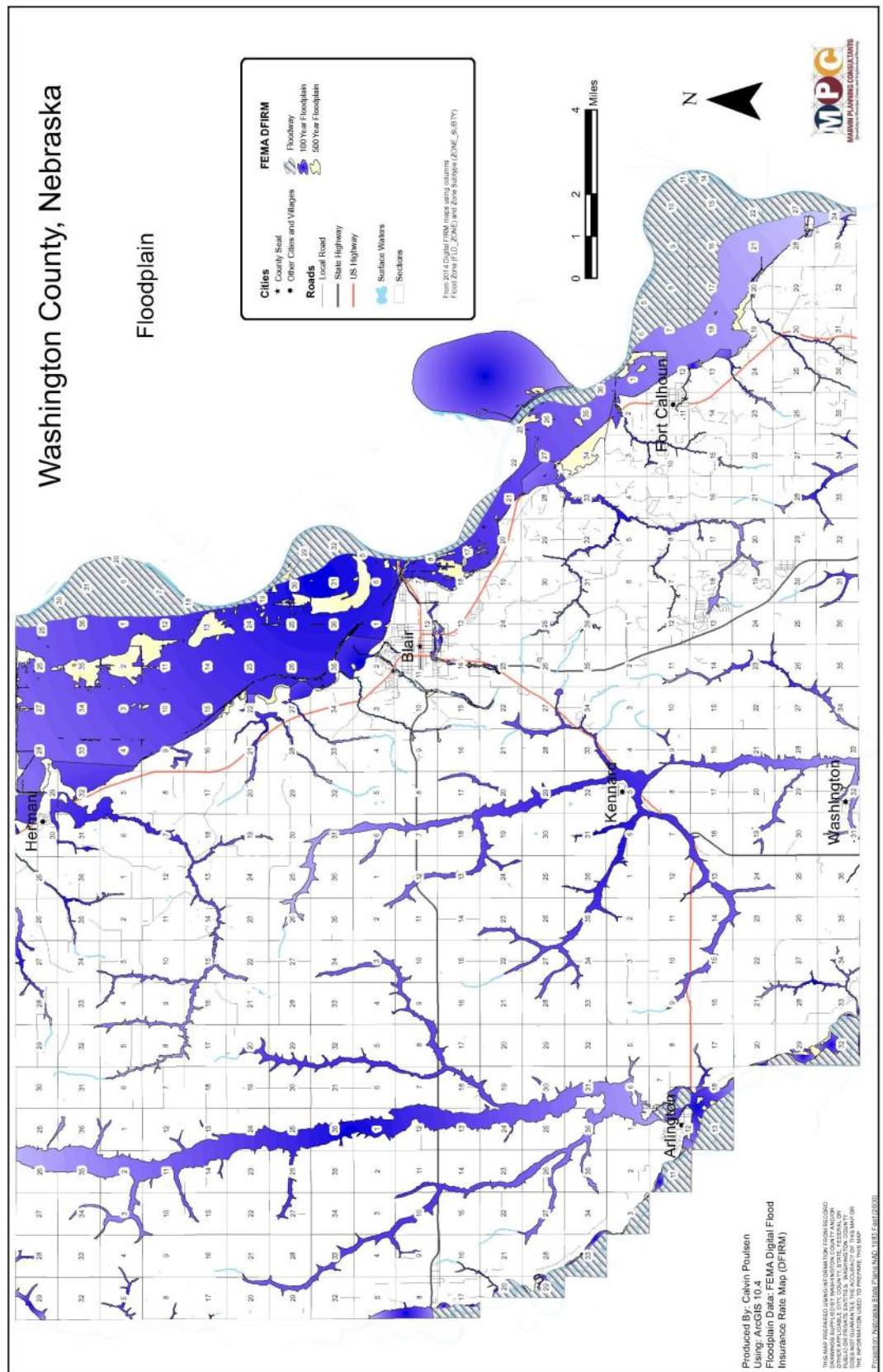


FIGURE 7.19 FLOODPLAIN AND FLOODWAY MAP



Natural Resources and the Environment

of natural precipitation received in the area.

The use of irrigation is critical during the growing and finishing periods of the crop lifecycle. The demand for irrigation can have major impacts on the draw down of the aquifer and the aquifers ability to recharge itself in an appropriate time period.

Irrigation in Washington County does have some limitations based upon the topography/percentage slope of agricultural grounds. However, if an area can be irrigated in a cost-effective manner then it has a high probability of occurring.

Transmissivity

Transmissivity is the term used to describe the ability of water to move below groundwater through the different soils. The data are described in terms of "1000 gallons/day/foot". The higher the numbers the more water that is transmitted through the soils. Therefore, if an area indicates a Transmissivity of 50 to 100, it means there is between 50,000 to 100,000 gallons/day/foot being transmitted through these soils.

Transmissivity is a critical component to determining the wellhead protection areas. Since the rate of flow below the surface is critical to identifying how much time is required for water to travel from one spot to the wellhead.

FLOODWAYS AND FLOODPLAINS

Flooding is the temporary covering of the soil surface by flowing water from any source, such as streams and rivers overflowing their banks, runoff from adjacent or surrounding slopes, or a combination of different sources. During a flooding event there are a number of components that make up the flooded area. These areas include:

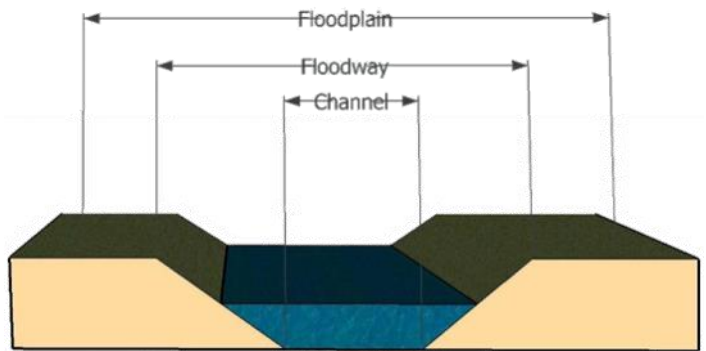
Floodway which is the channel of a watercourse and those portions of the adjoining floodplains which are required to carry and discharge the 100-year flood with no significant increase in the base flood elevation.

Floodplain which is the low land near a watercourse which has been or may be covered by water from flood of 100-year frequency, as established by engineering

practices of the U.S. Army Corps of Engineers. It shall also mean that a flood of this magnitude may have a 1 percent chance of occurring in any given year.

Floodway Fringe which is that portion of a floodplain that is inundated by floodwaters but is not within a defined floodway. Floodway fringes serve as temporary storage for floodwaters.

The floodplain also includes the floodway and the flood fringe, which are areas covered by the flood, but which do not experience a strong current.



The floodplain area of greatest significance in terms of state and federal regulation is the 100 year floodplain. This area is defined by the ground elevation in relation to the water elevation experienced during a 100 year flood event. The 100 year floodplain is calculated to be the elevation level of flood water expected to be equaled or exceeded every 100 years on average. In other and more accurate words, the 100 year flood is a 1% flood, meaning it defines a flood that has a 1% chance of being equaled or exceeded in any single year.

Preserving the floodplain and floodway are critical to limiting the level of property damage that can occur as well as the level of damage to life of the occupants of the area. Land when not flooded seems to be harmless, but it is those rare times that threaten life and property that need to be controlled.

In recent years there have been numerous flooding occurrences in Nebraska and the Midwest. These events have included the Platte River, the Missouri River, and the Mississippi River, as well as their tributaries. Each of these events have caused significant damage to life and

Natural Resources and the Environment



A home north of Quincy, Illinois within the 100 year floodplain - river is between 1 and 2-miles away



Same home during the 2008 Mississippi River floods

property. In order to protect an individuals property there are specific rules and guidelines that need to be followed. On some occasions these guidelines work and others they may not; most guidelines are developed for 100 year flooding events. The times that the guidelines do not work are typically referred to a 500 year event for lack of a better term. However, in some cases, due to mother nature and increases in development runoff, the area needed to handle the floodway and floodplain (100 year event) have increased due to the amount and speed that the water is reaching the streams and rivers.

Additionally, in 2011, the state of Nebraska and Iowa saw similar destruction when the Missouri River flooded. That flooding destroyed large sections of Interstates 680 and twenty-nine in Iowa, which were laying flat on the ground. In

themed 2000's, Cedar Rapids. Iowa saw numerous structures swept off their foundations and sent downstream creating huge losses and large amounts of recovery dollars to be spent.

NATURAL RESOURCES/ENVIRONMENT GOALS AND POLICIES

Soils

Soil Goal 1

Washington County needs to protect specific soils regarding the suitability of certain uses.

Soil Policies and Strategies

- Soil-1.1 The County should require the use of the Planned Unit Development technique for larger developments in highly sensitive areas.
- Soil-1.2 Discourage conversion of designated prime agricultural land and soils to non-agricultural uses by targeting less productive agricultural soils (crops) for urban or non-farm uses.

Water (surface water and groundwater)

Water Goal 1

Protect both the surface water and groundwater that runs through and is under the county.

Water Policies and Strategies

- W-1.1 Encourage the preservation of environmentally sensitive areas such as wetlands, wooded areas, waterways (streams, ponds, lakes, rivers, etc.).
- W-1.2 Protect all water supplies and aquifers from development activities that may affect the quality of water; development must demonstrate a positive or, at least, a neutral impact on groundwater.
- W-1.3 Continue participation in the FEMA National Flood Insurance Program to prevent flood-caused loss of life and property.
- W-1.4 Washington County should discourage land use development within the floodplains of the county.
- W-1.5 Washington County should support soil and water conservation efforts to aid in erosion, sediment, and run-off control.
- W-1.6 Washington County should coordinate with and support city, regional, state and federal water-quality plans and programs so that high water quality will be achieved in the cities and villages of the County.

Natural Resources and the Environment

- W-1.7 Washington County should require the protection of riparian vegetation from damage that may result from development.
- W-1.8 Water erosion control structures, including riprap and fill, should be reviewed by the appropriate authorities to insure they are necessary and are designed to minimize adverse impacts on water currents, erosion, and accretion patterns.
- W-1.9 Washington County should consider the following in any public or private land use determination subject to county review:
- 1) the impact of filling or drainage of swamps or marshes;
 - 2) the damming of rivers and streams;
 - 3) the location and construction of highways and utility transmission lines; and
 - 4) any other land development activities which significantly interfere with the vegetation or soil cover or drainage patterns in critical habitat areas.



9

Land Use



Land Use

INTRODUCTION

The Washington County Land Use Chapter is to provide a general guide to land use which directs future uses and zoning criteria. The resulting land uses are intended to be a guide without creating multiple incompatibilities with what currently exists within Washington County. This Chapter reflects the existing conditions and should be flexible in order to meet the needs of its citizens as well as the vision of the county.

The Washington County Land Use Chapter provides the basis for the formulation of land use and the zoning regulations. For this reason, it is imperative to formulate a plan tailored to the needs, desires and environmental limitations of the planning area. The Chapter should promote improvements in all the components of the local economy.

WASHINGTON COUNTY LAND USE ELEMENTS

The elements of the Washington County Land Use Chapter include:

- Existing Land Use,
- Residential Density,
- County Land Use Management Policy (CLUMP), and
- Future Land Use Plan

Both of these elements are integrated in some manner. Effective evaluations and decisions regarding development decisions require a substantial amount of information to be utilized.

EXISTING LAND USE

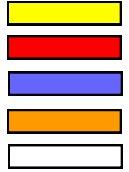
The term "Existing Land Use" refers to the current uses in place within a building or on a specific parcel of land. The number and type of uses can constantly change within a county, and produce a number of impacts either benefiting or detracting from the county. Because of this, the short and long-term success and sustainability of the county is directly contingent upon available resources utilized in the best manner given the constraints the county faces during the course of the planning period.

Overall, development patterns in and around Washington County have been influenced by topography, water, soils and manmade features such as four Nebraska highways, one U.S. Highway and several hard-surfaced county roads. These items will likely continue to influence development patterns throughout the course of the planning period.

Existing Land Use Categories

The utilization of land is best described in specific categories that provide broad descriptions where numerous businesses, institutions, and structures can be grouped. For the purposes of the Comprehensive Plan, the following land use classifications are used:

- Farmsteads/Acreages
- Urban Density Residential
- Commercial uses
- Quasi-Public/Public
- Agriculture



The above land use categories may be generally defined in the following manner:

Agriculture- Row crop, alfalfa, pastureland and all grain crops are considered agriculture land uses. Washington County is an agricultural based county and the existing land use map verifies these uses.

Livestock facilities- These are specific confinement buildings including chicken and swine houses, dairies, and open lots for cattle. Washington County desires to become a Livestock friendly county once this plan and the new regulations are completed.



Residential- This category includes residential dwellings either as a farmstead, acreage or residential developments located within the county. Acreages are distributed throughout the County; while more dense residential development can be found along US Highway 75 between Blair and the Douglas County line.

Commercial- Uses in this category consist of convenient stores; feed, seed, automobile and machinery sales; petroleum sales, etc. Commercial uses tend to be located near or in the urban areas, as well as in close proximity to major highways for accessibility.

Land Use

Figure 9.1
Existing Land Use Map



Land Use

Figure 9.2
Existing Land Use—Density Map

Land Use

Industrial/Railroad Right-of-Way - Land uses of this nature include power plants, communication plants, light and heavy manufacturing, commercial storage, industrial parks, large salvage yards, etc. These uses tend to be located near municipalities and major transportation routes for accessibility purposes.

Physical Character of Washington County

One of the most critical factors, concerning land use development in any area is the physical characteristics of the area. The physical character of Washington County has a variety of different environmentally sensitive landscapes. The county has a variety of environments including:

- Missouri River valley including its floodplain
- Quality soils for crop production
- Rolling hills
- Limestone subgrades and on the surface

RESIDENTIAL DENSITY

Figure 9.2 identifies the existing residential densities per 1/4 section of ground at the time the plan was developed. Measuring the density per 1/4 section allows the existing land use analysis to identify specific development trends and where high demand is for residential developments. Specific densities examined include:

- 1 dwelling per 1/4 section
- 2 dwellings per 1/4 section
- 3 dwelling units per 1/4 section
- 4 to 6 dwelling units per 1/4 section
- 7 or more dwelling units per 1/4 section

The existing density will be critical in determining specific land use policies for the future of Washington County.

The existing density of Washington County was analyzed only within the county's jurisdiction. Currently, Washington County has 251,822 acres or 393.5 square miles within its boundaries. Of these 251,822 acres, the municipalities have land use and zoning jurisdiction over 38,890 acres (60.7 square miles) or 15.4% of the land area in Washington County.

The breakdown of the existing density is as follows:

- 1 dwelling per 1/4 section = 155 1/4 sections or 38.75 square miles
- 2 dwellings per 1/4 section = 442 1/4 sections or 110.5 square miles
- 3 dwelling units per 1/4 section = 57 1/4 section or 14.25 square miles
- 4 to 6 dwelling units per 1/4 section = 72 1/4 sections or 18 square miles

- 7 or more dwelling units per 1/4 section = 77 1/4 section or 19.25 square miles

These are approximations since this includes 1/4 sections split by the extraterritorial jurisdiction lines of the municipalities.

The majority of the 1/4 sections with 3 or dwelling units are located between the Nebraska Highway 133 environs and the US Highway 75 environs; basically south of Blair to the county line with Douglas County. The area contains rolling hills as well as steeper hills. The corridor of Highways 133 and 75 provide fast and easy access to points within Omaha.

COUNTY LAND USE MANAGEMENT POLICY (CLUMP)

Purpose of CLUMP

The purpose of the CLUMP system is to develop a broad policy acknowledging existing land use patterns, existing and future market demands, and manages these factors in relation to one another. CLUMP establishes a long-range management policy which in turn provides guidance for future land use development.

CLUMP Process

CLUMP was devised to identify and examine existing development trends for counties. The CLUMP process includes a review of two critical elements of the existing land use fabric within the County; which are:

- Existing Land Use patterns and locations (see Figure 9.1),
- Existing density of residential development per 1/4 section of ground, county-wide (see Figure 9.2), and
- Areas where development will likely move towards during the planning period.

CLUMP balances the demand for urban and non-urban development with the preservation and conservation of agriculture and the fiscal responsibilities to provide services either at the County or the municipal level. CLUMP utilizes principles found within the "Smart Growth" movement. According to the Urban Land Institute's publication *Smart Growth: Myth or Fact*, a major myth is "Smart growth is a code word for no growth". However, as the ULI points out, a major fact is "Smart growth recognizes growth and development are both inevitable and beneficial".

Land Use

“The goal of smart growth is not “no growth” or even slow growth. Rather, the goal is sensible growth that balances our need for jobs and economic development with our desire to save our natural environment”

-Parris Glendening,
former Governor State of Maryland

The development of CLUMP was premised on the belief that development pressures and demands exist and the best approach is to acknowledge and accommodate these pressures through diligent planning. However, these pressures must be managed and channeled to areas in the process of developing, or areas capable of accommodating this development over the long term.

CLUMP Concept

The CLUMP concept centers on four policy areas. These areas are:

- Urbanized Growth Area
- Agricultural
- Transitional,
- Urban Reserve

These three policy areas are indicated on Figure 9.3 of this document. These areas generally identify different levels of development based upon proximity to existing urban centers or smaller developments; proximity to major transportation routes; existing land use densities; and potential land uses to be allowed in the future. The intent is to concentrate each of the different policy considerations into areas based upon these factors.

Intense development (major commercial centers, densely populated subdivisions, etc.) should be encouraged to locate within or adjacent to the existing communities of Washington County. Ultimately, the CLUMP concept is to encourage growth and development within the unincorporated areas of Washington County only when land management approach proves to be satisfactory.

Policy Areas

Urbanized Growth Area

The Urbanized Growth Area is the preferred location for dense development and larger commercial and industrial land uses. Urbanized Growth Area is intended to accommodate the following policies:

- Planned and contiguous growth extending out from the cities and villages of Washington County,

- These areas would be likely be connected to existing or extended city services, such as: Water, Sanitary Sewer, electrical power, etc.
- Development in these areas would likely see the extension of the municipal street systems.

The Urbanized Growth Area covers the extraterritorial jurisdictions of the municipalities. The proposed land uses for the this policy area should follow the uses laid out within each community's future land use plan.

Agriculture Policy Area

The Agriculture policy area is intended to accommodate the following policies:

- The preservation of agricultural uses,
- Low density residential development, primarily farmsteads and residences connected to an existing farming operation.

• The Agriculture policy area covers the majority of Washington County. The proposed land uses for the Agriculture policy areas are:

- General Agriculture,
- Transitional Agriculture,
- Mixture of Agriculture and agri-businesses,
- Public
- Parks / Recreation

When making future land use and zoning decisions, the policy allows only these use types to be located within an Agriculture policy area. These areas have been identified based upon their lack of development and the ability to preserve the agricultural base of Washington County. All future development of this type should be located in the designated areas in order to minimize future sprawl and haphazard development.

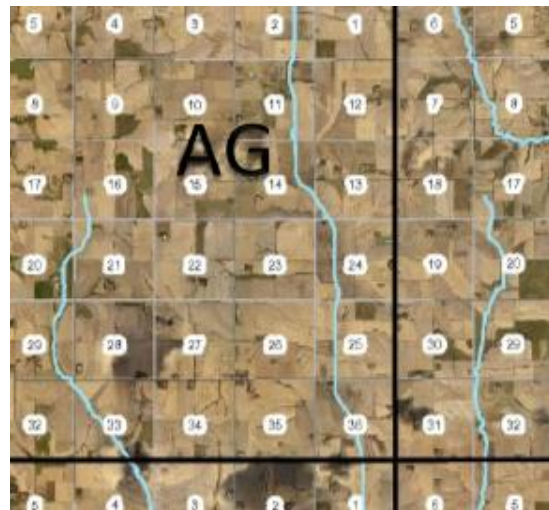


Figure 9.3
CLUMP MAP

Land Use

Figure 9.4
Future Land Use Map

Transitional Policy Area

The Transitional Policy Area is intended to accommodate the following policies:

- Higher density development than allowed in the Agricultural areas. Typically, residential acreages,
- Located along major transportation routes within the county,
- Location of higher intensity uses,
- Potential growth areas adjacent to the smaller communities.



The Transitional Policy Areas are generally located throughout Washington County. The locations are as follows:

- West side of the Blair Extraterritorial Jurisdiction
- East of US Highway 75, south of Blair
- South of Kennard to Washington
- Southeast of Arlington
- West of Herman

The proposed land uses for the Transitional policy areas are:

- General Agriculture,
- Transitional Agriculture,
- Rural Residential
- Mixture of Agriculture and agri-businesses,
- Public, and
- Parks / Recreation

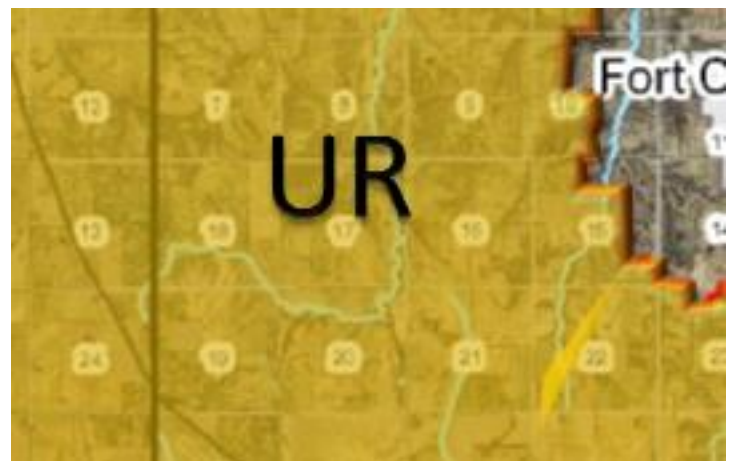
When making future land use and zoning decisions, the policy allows any of these use types to be located within an Transitional policy area. These areas, as well as the area within the extraterritorial jurisdictions of the communities should allow for ample development opportunities while allowing for a controlled growth policy. All future development of this type should be located in the designated areas

in order to minimize future sprawl and haphazard development.

Urban Reserve Policy Area

The Urban Reserve policy area is intended to accommodate the following policies:

- More dense development including residential and commercial,
- Residential development could reach densities typically seen in urban areas provided some level of centralized water and sewerage is in the development,
- Major areas along the highways are intended to aid in strengthening the economic base of Washington County.



The Urban Reserve policy areas are located:

- South of Blair and extends in places from Washington to US Highway 75, southeast of Fort Calhoun. This area is the second largest area behind the AG policy area.
- North and West of Arlington along the Elkhorn River environs.

Both of these areas are based upon the number and locations of the higher density residential areas.

The proposed land uses for the Urban Reserve policy areas are:

- Rural Residential,
- Urban Residential,
- Commercial,
- Industrial,
- Transitional Agriculture,
- Agri-businesses,
- Public
- Parks / Recreation.

Land Use



When making future land use and zoning decisions, the policy allows any of these use types to be located within a Urban Reserve policy area unless

overlap uses are allowed in another policy area.

Future development, especially the commercial and industrial uses, urban residential, and rural residential should be designed in ways to minimize impact on surrounding uses (i.e. cluster development, development away from environmentally sensitive conditions). One key factor determining the Urban Reserve locations was based upon the density of existing residential development. Due to the sensitivity of the soils regarding percolation, and flooding hazard and slopes, any land use and zoning changes to the maps must consider the potential impacts on the soils and other natural resources and the impact on adjacent properties. All future development of this type should be located in the designated areas in order to minimize future sprawl and haphazard development.

FUTURE LAND USES

The Future Land Use Plan provides the basis for the formulation of land use policy and zoning regulations. Therefore, it is imperative to formulate a plan tailored to the needs, desires and environmental limitations of the planning area. The following principles and land use concepts have been formed to guide future development activities within Washington County.

The plan is based upon existing conditions and projected future conditions for the county. The criteria used in this Plan reflect several elements, including:

- the current use of land within and around the county
- the desired types of growth, including location
- future development activities
- physical characteristics, opportunities and constraints of future growth areas
- current population and economic trends affecting the county

Efficient allocation of land recognizes the forces of the private market and the limitations of the capital. This Plan acknowledges these factors and their role in the development of Washington County. A Future Land Use Plan is intended to be a general guide to future land uses; while, balancing private sector development (the critical growth element in any county) with the concerns, interests, and demands of the overall local economy.

The land uses for Washington County are becoming

Land Use

more and more critical as the county continues to feel growth pressures around Blair and along the Douglas County line and Omaha. The future policies within this plan will be critical to directing growth in Washington County for the next 10 to 20 years.

Land Use Categories

The future land uses for Washington County are separated into seven categories. The following list shows the land uses within this plan:

- Primary Agricultural
- Transitional Agricultural
- River Protection Corridor
- Rural Residential
- Urban Residential
- Commercial
- Industrial
- Parks and Recreation

PRIMARY AGRICULTURE

General Purpose

This land use district provides for all agriculture practices. In this "agriculture first" land use district, agricultural activities should be given primary consideration where conditions prove favorable. This category is where livestock production and feeding operations are allowed and non-farm residential development are discouraged.

Compatible Uses

1. Crop production, including grazing lands
2. Livestock operations for all types of animals
3. Private grain storage
4. Commercial grain storage
5. Commercial uses related to agriculture such as: fertilizer processing and storage, grain elevators, etc.
6. Manure/fertilizer applications
7. Single acreage developments
8. Public recreational, wildlife and historical areas
9. Renewable energy equipment
10. Agri-Tourism activities such as: hunting preserves, fishing, vineyards etc.
11. Religious uses and structures
12. Educational uses and structures

Incompatible Uses

1. Residential/Acreage developments not associated with a farming operation
2. Mobile homes as a single-family dwelling
3. Large commercial developments

Potential issues to consider

1. Rural Water availability and connections
2. Slopes
3. Topography
4. Natural amenities such as trees, ponds, and streams
5. Site drainage
6. Flooding hazards.
7. Groundwater availability
8. Groundwater contamination
9. Minimum lot sizes and residential densities
10. Wetlands
11. Existing and/or proposed sanitary system
12. Potable well locations
13. Wellhead protection areas
14. Proximity to conflicting uses such as new acreages near livestock confinements

Special Policies

1. Minimum residential lot sizes should be kept at the lowest possible size accommodating both private water and sanitary sewer.
2. Residential densities within this land use category should be no more than 1 dwelling units per 80 contiguous acres. However, provisions should be put into place to allow further splits under specific conditions.
3. Cluster developments should be considered and used whenever soils, topography, natural amenities warrant.
4. Separation distances should be applied only to the livestock facility.
5. Smaller livestock facilities, up to 1,000 animal units should be a permitted use; while larger livestock feeding operations be regulated through the conditional use process in order to help minimize environmental impacts and the health, safety and general welfare of the public.





TRANSITIONAL AGRICULTURE

General Purpose

The Transitional Agriculture represents an area in the County where agriculture is protected, but limited. The Transitional Agriculture land use is intended to provide a location where agriculture can continue to thrive but may at some point in the future be influenced by growth in the adjacent communities.

Compatible uses

1. Crop production, including grazing lands
2. Livestock operations for all types of animals
3. Agri-Tourism activities such as: hunting preserves, fishing, vineyards etc.
4. Private and commercial grain storage
5. Manure/fertilizer applications
6. Single acreage developments
7. Public recreational, wildlife and historical areas
8. Renewable energy equipment
9. Religious uses and structures
10. Educational uses and structures

Incompatible Uses

1. Large scale residential developments including mobile homes as a single-family dwelling unless located within a mobile home park
2. Livestock operations over 1,000 animal units
3. Large commercial developments

Potential issues to consider

1. Rural Water availability and connections
2. Slopes
3. Proximity to existing livestock facilities
4. Topography
5. Natural amenities such as trees, ponds, and streams
6. Site drainage
7. Flooding hazards.
8. Groundwater availability
9. Groundwater contamination
10. Wetlands
11. Existing and/or proposed sanitary system
12. Potable well locations
13. Wellhead protection areas

Special policies

1. Residential lot sizes may vary depending upon the types of sanitary system installed and the source of potable water.
2. Residential densities within this land use category should be no more than 4 dwelling units per 1/4 section.
3. Cluster developments should be considered and used whenever soils, topography, natural amenities warrant.

RIVER PROTECTION CORRIDOR

General Purpose

This land use district is shown along the Missouri River and Elkhorn River. The River Protection Corridor has the environmental objective of protecting water supplies through a limited number of permitted uses. Preserving water quality and minimizing flood hazards are the leading priorities in considering any type of land use. Development meeting the floodplain regulations may construct in identified floodplains. However, no new construction will be allowed in the designated floodway unless a Letter of Map Amendment (LOMA) can be obtained from FEMA.

Compatible uses

1. Crop production, including grazing lands
2. Private grain storage
3. Manure/fertilizer applications
4. Single acreage developments
5. Public recreational, wildlife and historical areas
6. Tourism activities such as: parks, hunting preserves, fishing etc.
7. Religious uses and structures
8. Educational uses and structures
9. Community/Recreational Center
10. Larger park and recreation areas
11. Mining operations
12. Marinas

Incompatible Uses

1. Livestock operations
2. Large commercial developments
3. Large industrial developments
4. RV Storage located in the floodplain and/or floodway
5. Mobile homes as a single-family dwelling unless located within a mobile home park

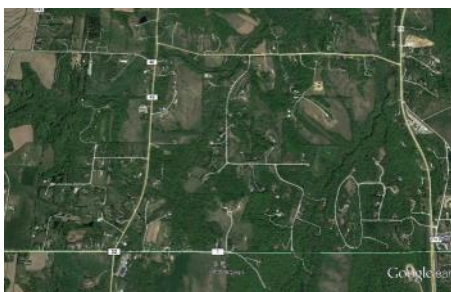
Potential issues to consider

1. Floodway
2. Floodplain and flooding hazard
3. Rural Water availability and connections
4. Proximity to existing livestock facilities
5. Wetlands
6. Depth to groundwater
7. Topography
8. Natural amenities such as trees, ponds, and streams
9. Site drainage
10. Groundwater contamination
11. Existing and/or proposed sanitary system
12. Potable well locations
13. Wellhead protection areas

Special policies

1. Residential lot sizes may vary depending upon the types of sanitary system installed and the source of potable water.
2. Residential densities within this land use category should be no more than 1 dwelling units per 80 contiguous acres. However, provisions should be put into place to allow further splits under specific conditions.
3. When a sandpit development or mining operation is proposed and the development is the proposed reclamation solution, the density should be greater.
4. Cluster developments should be considered and used whenever soils, topography, natural amenities warrant.





RURAL RESIDENTIAL

General Purpose

This land use is intended to provide for residential development adjacent to and in close to proximity to the municipalities and highways where conditions prove favorable. Industrial, commercial or livestock operations of any size should not be permitted and buffers in the residential land use area would be critical. Lot size requirements would be based upon the capacity of the area to provide potable water and to properly handle sanitary waste systems. However, it is intended that more densely developed areas would be connected to a rural water district.

Compatible uses

1. Residential uses
2. Low density residential developments
3. Acreages and associated accessory uses
4. Religious uses and structures
5. Educational uses and structures
6. Crop production, including grazing lands
7. Community/Recreational Center/Recreational facilities
8. Renewable energy sources at a residential scale

Incompatible Uses

1. Livestock operations
2. Large commercial developments
3. Mobile homes as a single-family dwelling unless located within a mobile home park

Potential issues to consider

1. Rural Water availability and connections
2. Floodplain and flooding hazard
3. Slopes
4. Proximity to existing livestock facilities
5. Wetlands
6. Depth to groundwater
7. Topography
8. Natural amenities such as trees, ponds, and streams
9. Site drainage
10. Existing and/or proposed sanitary system
11. Potable well locations
12. Wellhead protection areas.

Special policies

1. Residential lot sizes may vary depending upon the types of sanitary system installed and the source of potable water.
2. Residential densities within this land use category should be between 8 and 16 dwelling units per 1/4 section.
3. Cluster developments should be considered and used whenever soils, topography, natural amenities warrant.
4. The development should incorporate the natural environment, including existing slopes, existing trees, existing waterways, etc. into the overall design.
5. Where possible all roads should be paved.

URBAN RESIDENTIAL

General Purpose

This land use is intended to provide for residential development with densities similar to those found in incorporated communities. These areas will need to be connected to either a community water and/or sanitary system or rural water district. The location of these developments should be located within the more urbanizing area of Washington County and not within the Agricultural Preservation areas. This type of development should have immediate access to major highways or paved county roads.

Compatible uses

1. Residential uses
2. Religious uses and structures
3. Educational uses and structures
4. Community/Recreational Center/Recreational facilities

Incompatible Uses

1. Livestock operations
2. Large commercial developments
3. Mobile homes as a single-family dwelling unless located within a mobile home park

Potential issues to consider

1. Rural Water availability and connections
2. Floodplain and flooding hazard
3. Slopes
4. Proximity to existing livestock facilities
5. Wetlands
6. Depth to groundwater
7. Topography
8. Natural amenities such as trees, ponds, and streams
9. Site drainage
10. Existing and/or proposed sanitary system
11. Potable well locations
12. Wellhead protection areas.

Special policies

1. Residential lot sizes may vary depending upon the types of sanitary system installed and the source of potable water.
2. Density of lots could be similar to an adjacent community unless the development is on individual septic and water, then the minimum sanitary standards would apply.
3. Cluster developments should be considered and required in this land use area.
4. The development should incorporate the natural environment, including existing slopes, existing trees, existing waterways, etc. into the overall design.
5. Where possible all roads should be paved.



Land Use



COMMERCIAL LAND USE

General Purpose

The Commercial land use provides for larger commercial development where transportation routes and other conditions prove favorable. This land use is to promote commercial and any value added agricultural industry in Washington County and to provide services and development opportunities at key locations within the County.

Compatible uses

1. Agricultural/commercial uses including implement stores
2. Commercial grain facilities
3. Uses serving the motoring public (truck stops, convenient stores, etc.)
4. Religious uses and structures
5. Educational uses and structures
6. Self-storage facilities including recreational vehicles, boats, etc.
7. Community/Recreational Center
8. Adult entertainment where appropriate

Incompatible Uses

1. Livestock operations
2. Residential developments
3. Mobile homes as a single-family dwelling unless located within a mobile home park

Potential issues to consider

1. Rural Water availability and connections
2. Floodplain and flooding hazard
3. Slopes
4. Erosion controls
5. Wetlands
6. Depth to groundwater
7. Topography
8. Natural amenities such as trees, ponds, and streams
9. Site drainage
10. Existing and/or proposed sanitary system
11. Potable well locations
12. Wellhead protection areas

Special policies

1. No minimum lot size other than adequate space for vehicular movement, parking and septic and water systems.
2. Developments of 1 acre or more may be required to meet the standards of NPDES permitting.
3. Developments that create more than a 5% increase in runoff may be required to construct a detention basin to control runoff.

INDUSTRIAL LAND USE

General Purpose

This land use provides for industrial development to continue where transportation routes and other conditions prove favorable, including rail access. These industrial land use areas are to promote general industrial development, the ag-industry of Washington County and to provide services and development opportunities at key locations within the County. These areas will also provide the necessary opportunities needed under the Washington County Enterprise Zone criteria.

Compatible uses

1. Light manufacturing and assembly
2. Meat packing
3. Storage and warehousing
4. Trucking terminals
5. Commercial grain facilities
6. Post-Secondary Educational uses and structures (including Technical Training Centers)
7. Renewable energy facilities including Ethanol and Bio-Diesel
8. Adult Entertainment where appropriate
9. Agricultural/commercial uses including implement stores
10. Construction yards
11. Salvage yards with specific screening guidelines
12. Agricultural uses

Incompatible Uses

1. Livestock operations
2. Residential developments
3. Mobile homes as a single-family dwelling unless located within a mobile home park

Potential issues to consider

1. Rural Water availability and connections
2. Floodplain and flooding hazard
3. Slopes
4. Erosion controls
5. Wetlands
6. Depth to groundwater
7. Topography
8. Natural amenities such as trees, ponds, and streams
9. Site drainage
10. Existing and/or proposed sanitary system
11. Potable well locations
12. Wellhead protection areas

Buildable Lot Policies

1. No minimum other than adequate space for vehicular movement, parking and septic and water systems.

Special policies

1. No minimum lot area required.
2. Developments of 1 acre or more may be required to meet the standards of NPDES permitting.
3. Developments that create more than a 5% increase in runoff may be required to construct a detention basin to control runoff.





PAKS AND RECREATION LAND USE

General Purpose

The Parks and Recreation land use district is established in order to specifically acknowledge those areas within Washington County providing special services for the residents, the region, and the state.

Compatible uses

1. Crop production, including grazing lands
2. Manure/fertilizer applications
3. Public recreational, wildlife and historical areas
4. Agri-Tourism activities such as: hunting preserves, fishing, vineyards etc.
5. Educational uses and structures

Incompatible Uses

1. Livestock operations
2. Residential developments
3. Commercial developments
4. Industrial developments
5. Mobile homes as a single-family dwelling unless located within a mobile home park

Potential issues to consider

1. Rural Water availability and connections
2. Floodplain and flooding hazard
3. Slopes
4. Erosion controls
5. Wetlands
6. Depth to groundwater
7. Topography
8. Natural amenities such as trees, ponds, and streams
9. Site drainage
10. Existing and/or proposed sanitary system
11. Potable well locations
12. Wellhead protection areas

Special policies

1. No minimum lot size other than adequate space for vehicular movement, parking and septic and water systems.

CONSERVATION SUBDIVISIONS

The graphic to the right represents a standard subdivision and how it can be redrawn into a conservation subdivision. The primary usage of this technique in Washington County is so a developer can maintain a specific density of building lots while protecting key environmental elements on the property. Some of these environmental elements include:

- Wetlands
- Steep slopes
- Floodplains
- Streams
- Drainage ways
- Natural prairie
- Crop land

The concept allows the developer and county to negotiate the lot sizes through a plan unit development (PUD) concept. In most cases the sensitive areas are placed in some type of conservation easement or trust. The protected areas, in a majority of cases, are placed into a common area to be shared by all the residents; this in turn increases the overall value of the lots. These developments are sometimes referred to as golf course developments without the golf course.

The other form of a conservation subdivision focuses on similar principles of the previously discussed development style but allows for larger lots and requires building lots to incorporate key environmental amenities; trees, waterways, rock outcroppings, etc. into the layout and positioning of the homes and businesses in a manner requiring less removing of dirt and tress.

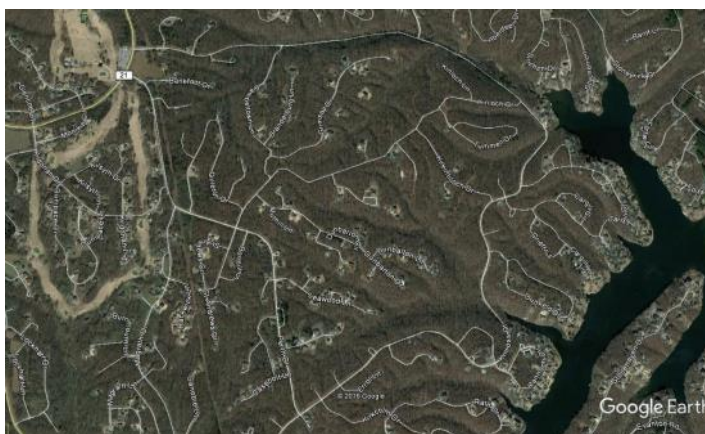
One final addition to the concept of conservation subdivisions deals with the use of rain gardens. Rain gardens are growing in interest. These are garden/flower/grass beds planted in a mixture filtering ground materials and have native species included in order to place flora in an environment where it will thrive. These rain gardens do a couple of key things, they help filter toxic chemicals found in rainwater runoff during a storm event, and finally aid in filtering water back into the areas groundwater system.

Conservation subdivisions can:

- Preserve environmental amenities such as; mature trees, native grass, wetlands, waterways, slopes, floodplains, etc.
- Preserve valuable vistas and view sheds
- Generate more income from more valuable lots
- Become the desired location to live



Example of a conservation subdivision on the west edge of Lincoln, Nebraska



Example of a conservation subdivision near Bella Vista, Arkansas

Land Use

FUTURE LAND USE GOALS

Land Use Goal and Objectives

Guiding future growth and development in Washington County in order to insure compatible uses locate together is essential during this planning period.

General Land Use Policies and Strategies

GENLU-1.1 Future land uses in the county should carefully consider the existing natural resources of the area, including soils, wetlands, slopes, rivers, and groundwater.

GENLU-1.2 Future growth and development in Washington County should work toward compact patterns of land uses.

GENLU-1.3 The County should confine denser development to the areas identified as Urban Reserve on the CLUMP Map.

GENLU-1.4 Washington County should consider limited future development to identified areas of the county.

GENLU-1.5 The Washington County Land Use Plan and Zoning Regulations should be designed to expedite the review and approval process where possible.

GENLU-1.6 All land uses and structures should be carefully reviewed for compliance with the duly adopted floodplain and floodway regulations in Washington County.

Agricultural Land Use Policies and Strategies

AGLU-1.1 Washington County should continue to develop policies enhancing their ability to become "Livestock Friendly".

AGLU-1.2 Washington County should continue to encourage uses referred to as "Agri-tourism" (Wineries and orchards).

AGLU-1.3 Livestock production should be encouraged within the primary agricultural areas of Washington County provided environmental conditions are appropriate.

AGLU-1.4 Livestock production should be protected within the primary agricultural area from the establishment of conflicting uses such as acreages.

AGLU-1.5 New livestock operations should be located in areas where their impact on neighboring land uses will be minimal.

AGLU-1.6 Washington County should allow agricultural production throughout the county; except where there may be potential conflicts with other policies of

this plan.

AGLU-1.7 Livestock operations should be encouraged to utilize odor reducing technologies such as methane digestion and composting .

AGLU-1.8 Regulations should be established and implemented creating setback and buffer requirements to minimize the impacts of solid, liquid, and gas emissions from livestock facilities.

AGLU-1.9 Appropriate separation distances between livestock facilities and residential uses, within the primary agricultural areas should be established but said distances should favor the producers in this district.

AGLU-1.10 Establish adequate separation distances between residences and livestock operations, within the primary agricultural district, allowing for potential expansion of livestock operations.

AGLU-1.11 Washington County should minimize encroachment of non-agricultural uses into areas designated as "Prime Farmland".

AGLU-1.12 Encourage low to zero non-farm densities in prime farmland areas and other agricultural districts by providing residential lot size requirements, densities and separation distances between residential and agricultural uses.

AGLU-1.13 Protect the quality of groundwater in agricultural areas of Washington County.

AGLU-1.14 Work with livestock producers on a continual basis in evaluating protections and regulations.

AGLU-1.15 Work with livestock producers on better methods for treating and disposal of waste in Washington County.

River Protection Corridor Land Use Policies and Strategies

RPCLU-1.1 The Missouri River Corridor should be protected due to the nature of the soils in the area and the flooding occurring in the area.

RPCLU-1.2 The County should not allow the introduction of new livestock operations into the Missouri River Corridor, especially in any designated floodway.

RPCLU-1.3 The establishment of chemical storage facilities including the manufacturing of chemicals should not be allowed in this area.

- RPCLU-1.4 Existing uses within the Missouri River Corridor having a high contaminate potential should be relocated to a more suitable location when possible.
- RPCLU-1.5 The County should continue to promote the recreational potential of the area and work with existing property owners to establish specific eco-tourism opportunities.
- RPCLU-1.6 The County should work diligently to eliminate any permanent structures within any floodway area of the county.
- 3) environmental controls; and
 - 3) An adequate demonstration of the financial capacity (escrows, performance bonds, etc.) and responsibility of the applicants to complete the development and provide for operation and maintenance services.
 - 4) Should be appropriately, if not uniquely, suited to the area or site proposed for development;
 - 5) Should not be located in any natural hazard area, such as a floodplain or floodway or area of geologic hazard, steep slope, severe drainage problems or soil limitations for building or sub-surface sewage disposal, if relevant
 - 6) Should be furnished with adequate access – when possible a minimum of two entrances and exits.

Residential Land Use Policies and Strategies

- RESLU-1.1 Residential developments should be separated from more intensive uses, such as agriculture, industrial, and commercial development, by the use of setbacks, buffer zones, or impact easements.
- RESLU-1.2 Encourage low to zero non-farm densities in prime farmland areas and other agricultural districts by providing residential lot size requirements and proper separation distances between residential and agricultural uses.
- RESLU-1.3 Develop subdivision regulations to provide a quality living environment while avoiding inefficient and expensive public infrastructure expansions.
- RESLU-1.4 New residential developments should include a subdivision agreement, which provides for the maintenance of common areas, easements, groundwater, use of plant materials and drainage.
- RESLU-1.5 Establish zoning and subdivision design standards requiring buffers, and screening standards and functional usable green space, for new developments.
- RESLU-1.6 All proposed rural area developments should be based on reasonable expectations and no large-scale development should be approved without:
- 1) The submission and approval of a layout and design concept, with provision for the staging and servicing of all phases of the development;
 - 2) The approval of all federal and state agencies relative in any applicable health, safety and
- RESLU-1.7 Examine implementation of a planned unit development (PUD)/Clustered Development/Conservation Subdivision concept which provides a viable alternative to conventional urban development patterns, while providing a means to encourage creative yet responsible/sensitive developments.
- RESLU-1.8 Washington County should review and accommodate, wherever possible, any new or alternative development concepts or proposals, provided such concepts or proposals are consistent with and do not compromise in any way the established disposition of land uses on the Land Use Map or the goals and policies of the Plan.
- RESLU-1.9 All new residential developments or acreage should demonstrate their ability to hook onto a rural water district or their ability to provide potable water without damaging neighboring properties.
- RESLU-1.10 New residential construction or relocations should not be allowed along any minimum maintenance road unless the road is upgraded to county specifications and paid for by the property owner, prior to construction.

Land Use

Commercial Land Use Policies and Strategies

- COMLU-1.1 Encourage the location of commercial uses to locate within the communities of Washington County or along the major highways.
- COMLU-1.2 Utilize frontage roads within clustered commercial centers when locating along major roads/highways.
- COMLU-1.3 Commercial uses should be required to provide their own adequate water supply without negatively impacting existing neighboring properties.
- COMLU-1.4 Landscaping standards for all new commercial construction and expansion to existing operations should be implemented.
- COMLU-1.5 Discourage the construction of “strip” commercial developments in rural areas of the county.

INDLU-1.9

The County should encourage industrial development that bases its products on renewable and indigenous raw materials. The County should recognize and encourage small-scale industries as viable alternatives to larger, conventional enterprises.

INDLU-1.10

Industrial Land Use Policies and Strategies

- INDLU-1.1 Encourage the location of industrial uses to locate within the communities of Washington County.
- INDLU-1.2 Where industrial uses need to locate in the rural areas of the county and need rail access, the county should work with Union Pacific Railroad to identify strategies for spur lines/sidetracks.
- INDLU-1.3 Industrial development not utilizing rail transport should be discouraged from locating next to a railroad right-of-way.
- INDLU-1.4 Heavy industrial uses with a high water and/or waste disposal requirement should be encouraged to locate or relocate only in or immediately adjacent to urban areas where all required services are available.
- INDLU-1.5 Industrial areas located outside a community's extraterritorial jurisdiction should have adequate services, including major utility lines, electric power substations and transmission lines, rail, sanitary sewer and water can be provided, and where appropriate, gas lines are available.
- INDLU-1.7 Industrial uses should be located so an adequate buffer space is provided between incompatible land uses.
- INDLU-1.8 The County should develop appropriate performance, design and specification standards and requirements for all existing and future industrial uses to guide their location or relocation in the County.



10

Transportation



Transportation

INTRODUCTION

Transportation networks tie communities together as well as providing a link to the outside world. Adequate circulation systems are essential for the safe and efficient flow of vehicles and pedestrians, and accessibility to all parts of the community. The Transportation Plan will identify existing systems and any major improvements planned for the future and those necessary to provide safe and efficient circulation of vehicles within Washington County, including major projects that ensure implementation of the Land Use Plan.

EXISTING TRANSPORTATION SYSTEM AND FACILITIES

Residents within a county have specific transportation needs. These include rail service, bus service, air transportation, as well as vehicular transportation. All of the transportation facilities present are not available within the county and require residents to travel to the nearest location. This portion of the Comprehensive Development Plan examines those services with regard to the closest proximity for residents of Washington County.

Railroad Service

The closest rail freight service to Washington County is in Omaha. However, the Union Pacific Railroad has one of the mainline routes running east to west through Washington County. The nearest passenger service is located in Omaha through Amtrak.



Photo 10.1

The UPRR Mainline at Kennard

Bus Service

The nearest commercial bus service with ticketing services is available in Omaha via Burlington Trailways and Greyhound.

Commercial Airport Service

Eppley Airfield in Omaha is one of the closest commercial facility to residents in Washington County. Currently, the airports have commercial service connections throughout the United States.

Small craft Public Airports

The Blair Municipal Airport is the nearest small aircraft facility. Runway #13/31 is 4200 feet by 100 feet with concrete surfacing. Elevation is listed at 1325 feet.



Photo 10.2

Aerial of Blair Municipal Airport

State and Federal Highways

Washington County has five major highways running through the county. The major north-south highways are Nebraska Highways 133, and 31; while US Highway 75 also crosses the county. The east-west connections are Nebraska Highways 91 and US Highway 30.

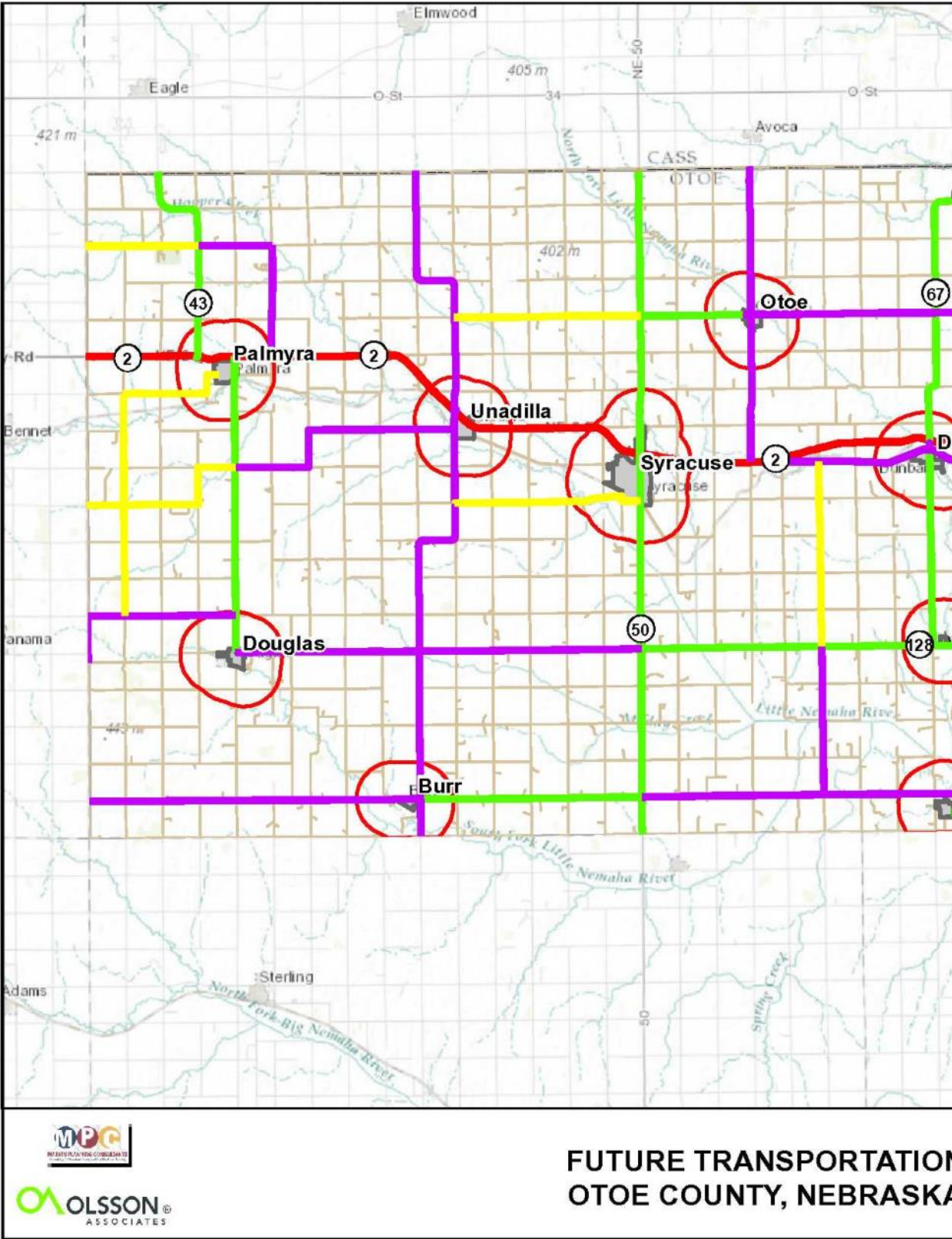
TRANSPORTATION PLANNING AND LAND USE

Land use and transportation create the pattern for future development and are extremely interdependent upon one another in order to effectively shape the community. An improved or new transportation route generates a greater level of accessibility and will likely determine how adjacent land will be utilized in the future.

In the short term, land use shapes the demand for transportation and vice versa; one key to good land use planning is to balance land use and transportation. However, new or improved roads, as

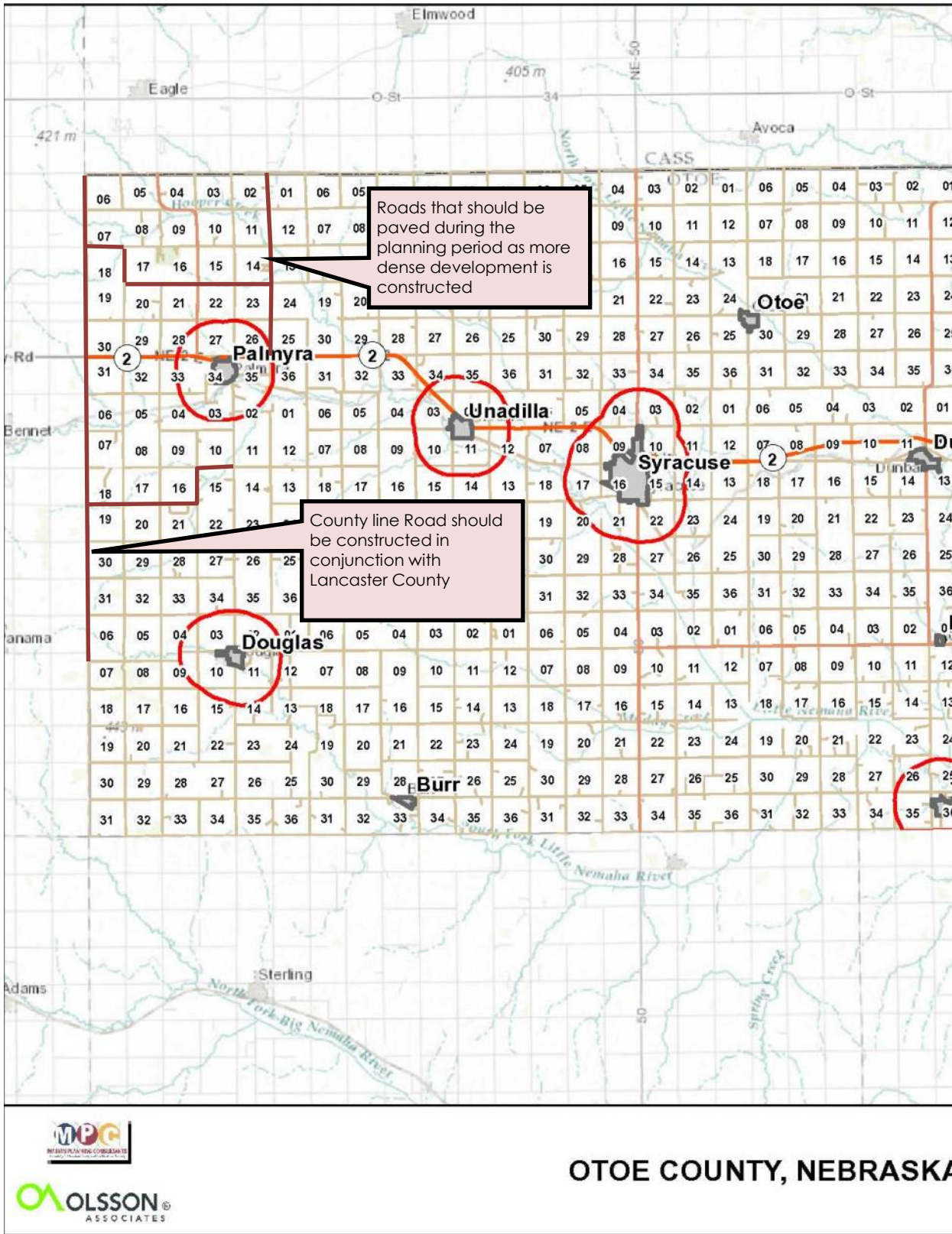
Transportation

Figure 10.1
Transportation System Map



Transportation

Figure 10.2
Transportation Improvements - Eastern Washington County



well as, county and state highways may change land values, thus altering the intensity of which land is utilized.

In general, the greater the transportation needs of a particular land use, the greater its preference for a site near major transportation facilities. Commercial activities are most sensitive to accessibility since their survival often depends upon how easy a consumer can get to the business. Thus, commercial land uses are generally located near the center of their market area and along highways or at the intersection of arterial streets.

Industrial uses are also highly dependent on transportation access, but in a different way. For example, visibility is not as critical for an industry as it is for a retail store. Industrial uses often need access to more specialized transportation facilities, which is why industrial sites tend to be located near railroad lines or highways to suit individual industrial uses.

Street and Road Classification System

All of the public highways, roads, and streets in Nebraska are divided into two broad categories, and each category is divided into multiple functional classifications. The two broad categories are Rural Highways and Municipal Streets. State statute defines Rural Highways as "all public highways and roads outside the limits of any incorporated municipality," and Municipal Streets as "all public streets within the limits of any incorporated municipality." Neb. Rev. Stat. § 39-2102 (RRS 1998)

Nebraska Highway Law (Chapter 39, Article 21, Revised Reissue Statutes of Nebraska 1943) proposes the functional classification of both rural and municipal roads and streets and public highways. Chapter 39, Article 21.03 lists rural highway classifications as:

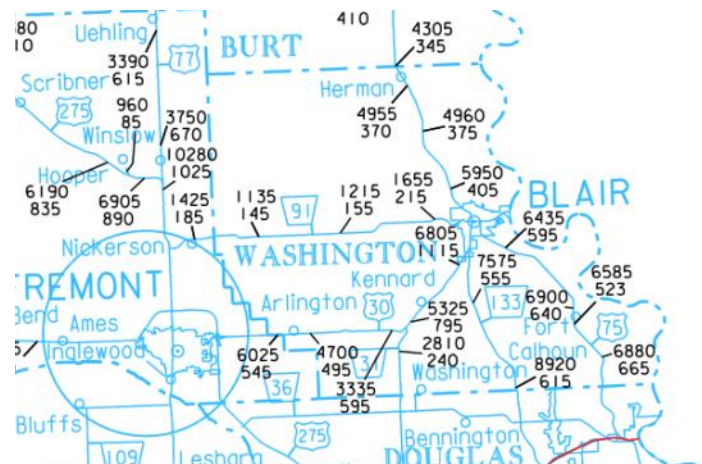
1. Interstate: federally-designed National System of Interstate and defense highways;
2. Expressway: second in importance to Interstate. Consists of a group of highways following major traffic desires in Nebraska and ultimately should be developed to multiple divided highway standards;
3. Major Arterial: consists of the balance of routes that serve major statewide interests for highway transportation in Nebraska. Characterized by high speed, relatively long distances, travel patterns;
4. Other Arterial: consists of a group of highways of less importance as through-travel routes.

5. Collector: consists of a group of highways that pick up traffic from the local or land-service roads and transport community centers or to the arterial systems. Main school bus routes, mail routes, and farm-to-market routes;
6. Local: consists of all remaining rural roads, generally described as land-access roads providing service to adjacent land and dwellings; and
7. Bridges: structures crossing a stream three hundred feet or more in width or channels of such a stream having a combined width of three hundred feet or more.

Traffic Counts in Washington County

Traffic flow within the county on the five highways varies considerably.

Figure 10.3:
Traffic Flow Map - 2014



Source: Nebraska Department of Roads

Figure 10.1 indicates the greatest traffic flows are at the county line with Douglas County along Nebraska Highway 133 with nearly 9,000 cars and 615 trucks per day; these numbers drop off slightly closer to Blair. The second greatest traffic flow is north of Fort Calhoun along US Highway 75 with 6,900 cars and 640 trucks per day. The highest semi volume id near the intersection of US Highway 30 and Nebraska Highway 133, 1,115 trucks at the roundabout. Other highways in the county have high traffic figures and are seen throughout Washington County.

Nebraska Department of Roads' Improvements

The Nebraska Department of Roads publishes an annual list of proposed projects for the current fiscal year, for fiscal years one to five years from the

Transportation

present, and six years and beyond. Washington County is in the Department of Road's District 1. Between Fiscal Years 2017 and 2022, there are five projects budgeted for the Washington County area. These projects include:

- US Highway 75 Blair to Herman - 10.1 miles surfacing, grading, shoulder work (2018-2022)
- US Highway 75 & 30 - 2.9 miles resurfacing (2017)
- US Highway 75 - Fort Calhoun to Blair - 7.91 miles resurfacing and bridge work (2018-2022)
- US Highway 75 - Fort Calhoun South - 4.65 miles milling and resurfacing (2018-2022)
- US Highway 30 - Blair Southwest - 5.78 miles resurfacing and bridge Fremont to Arlington - 3.59 miles milling, resurfacing and bridge work (2018-2022)

Overall the Nebraska Department of Roads is expecting to spend nearly \$40,000,000 in repairs and upgrades in the Washington County over the next six years.

FIGURE 10.4:
NDOR SIX-YEAR HIGHWAY PROGRAM
WASHINGTON COUNTY



Source: Nebraska Department of Roads

FUTURE TRANSPORTATION UPGRADES

Future transportation needs within Washington County will include a number of items including some paving of existing roads and repairing/replacing bridges throughout the county.

Figure 10.3 indicates key roads needing to be placed on the 1 and 6-year plan for paving. The goal for these areas was to minimize the amount of gravel needed with the higher density developments. One road is a shared county road with Lancaster County and coordination will need to be undertaken with

their Highway Department regarding future paving activities.

Transportation Policies and Strategies

- TRAN-1.1 Development in Washington County should be guided to safely utilize existing and future investment.
- TRAN-1.2 Development should be discouraged from occurring in areas where the road system is insufficient to handle any additional traffic load.
- TRAN-1.3 Improve, develop, and maintain well-traveled roads with hard surfacing, when possible.
- TRAN-1.4 Washington County should require new development to:
1. Limit access points on highways designated as arterials when alternative access points are feasible.
 2. Minimize direct access points onto arterial right-of-ways by encouraging the utilization of common driveways.
 3. New development should not be located along roads officially designated as "Minimum Maintenance"



11

Implementation



Implementation

ACHIEVING WASHINGTON COUNTY'S FUTURE

Successful plans have the same key ingredients: "2% inspiration and 98% perspiration." This section of the plan contains the inspiration of the many county officials and residents who have participated in the planning process. However, the ultimate success of this plan remains in the dedication offered by each and every resident.

There are numerous goals and objectives in this plan. We recommend reviewing the relevant goals during planning and budget setting sessions to determine what projects may need to be undertaken during the course of the fiscal year.

ACTION AGENDA

The Action Agenda is a combination of the following:

- Goals and Objectives
- Land Use Policies
- Support programs for the above items

It will be critical to earmark the specific funds to be used and the individuals primarily responsible for implementing the goals and objectives in Washington County.

Support Programs for the Action Agenda

Five programs will play a vital role in the success of Washington County's plan. These programs are:

1. **Zoning Regulations**--updated land use districts can allow the county to provide direction for future growth.
2. **Subdivision Regulations**--establish criteria for dividing land into building areas, utility easements, and streets. Implementing the Transportation Plan is a primary function of subdivision regulations.
3. **Plan Maintenance**--an annual and five-year review program will allow the county flexibility in responding to growth and a continuous program of maintaining the plan's viability.
4. **Housing Study** -- A Housing Study will be critical to use in direct relationship to the Comprehensive Plan due to the need for housing issues in the county. The study will help guide the county in the redevelopment and future development of housing throughout the county and all of the communities in Washington County.
5. **Strategic Plan** -- A Strategic Plan will assist in identifying future economic development strategies that will tie into the overall planning effort of the county. It will be critical to work with this document and the Plan in unison.

COMPREHENSIVE PLAN MAINTENANCE

ANNUAL REVIEW OF THE PLAN

A relevant, up to date plan is critical to the on-going planning success. To maintain both public and private sector confidence; evaluate the effectiveness of planning activities; and, most importantly, make mid-plan corrections on the use of county resources, the plan must be current. The annual review should occur during the month of January.

After adoption of the comprehensive plan, opportunities should be provided to identify any changes in conditions that would impact elements or policies of the plan. At the beginning of each year a report should be prepared by the Planning Commission, which provides information and recommendations on:

- whether the plan is current in respect to population and economic changes; and
- The recommended goals, objectives, and/or policies are still valid for the County and its long-term growth.

The Planning Commission should hold a meeting on this report in order to:

1. Provide citizens or developers with an opportunity to present possible changes to the plan,
2. Identify any changes in the status of projects called for in the plan, and
3. Bring forth any issues, or identify any changes in conditions, which may impact the validity of the plan.

If the Planning Commission finds major policy issues or major changes in basic assumptions or conditions have arisen which could necessitate revisions to the Comprehensive Plan, they should recommend changes or further study of those changes. This process may lead to identification of amendments to the Comprehensive Plan and would be processed as per the procedures in the next section.

UNANTICIPATED OPPORTUNITIES

If major new, innovative development and/or redevelopment opportunities arise which impact any number of elements of the plan and which are determined to be of importance, a plan amendment may be proposed and considered separate from the Annual Review and other proposed Comprehensive Plan amendments. The Comprehensive Plan amendment process should

adhere to the adoption process specified by Nebraska law and provide for the organized participation and involvement of citizens.

METHODS FOR EVALUATING DEVELOPMENT PROPOSALS

The interpretation of the Comprehensive Plan should be composed of a continuous and related series of analyses, with references to the goals and policies, the land use plan, and specific land use policies. Moreover, when considering specific proposed developments, interpretation of the Comprehensive Plan should include a thorough review of all sections of the Comprehensive Plan.

If a development proposal is not in conformance or consistent with the policies developed in the Comprehensive Plan, serious consideration should be given to making modifications to the proposal or the following criteria should be used to determine if a Comprehensive Plan amendment would be justified:

- How does the proposal fit within the overall County Land Use Management Policy (CLUMP)
- the character of the adjacent area
- the zoning and uses on nearby properties
- the suitability of the property for the uses allowed under the current zoning designation
- the type and extent of positive or detrimental impact that may affect adjacent properties, or the county at large, if the request is approved
- the impact of the proposal on public utilities and facilities
- the length of time the subject and adjacent properties have been utilized for their current uses
- the benefits of the proposal to the public health, safety, and welfare compared to
- the hardship imposed on the applicant if the request is not approved
- comparison between the existing land use plan and the proposed change regarding the relative conformance to the goals and policies
- consideration of County staff recommendations