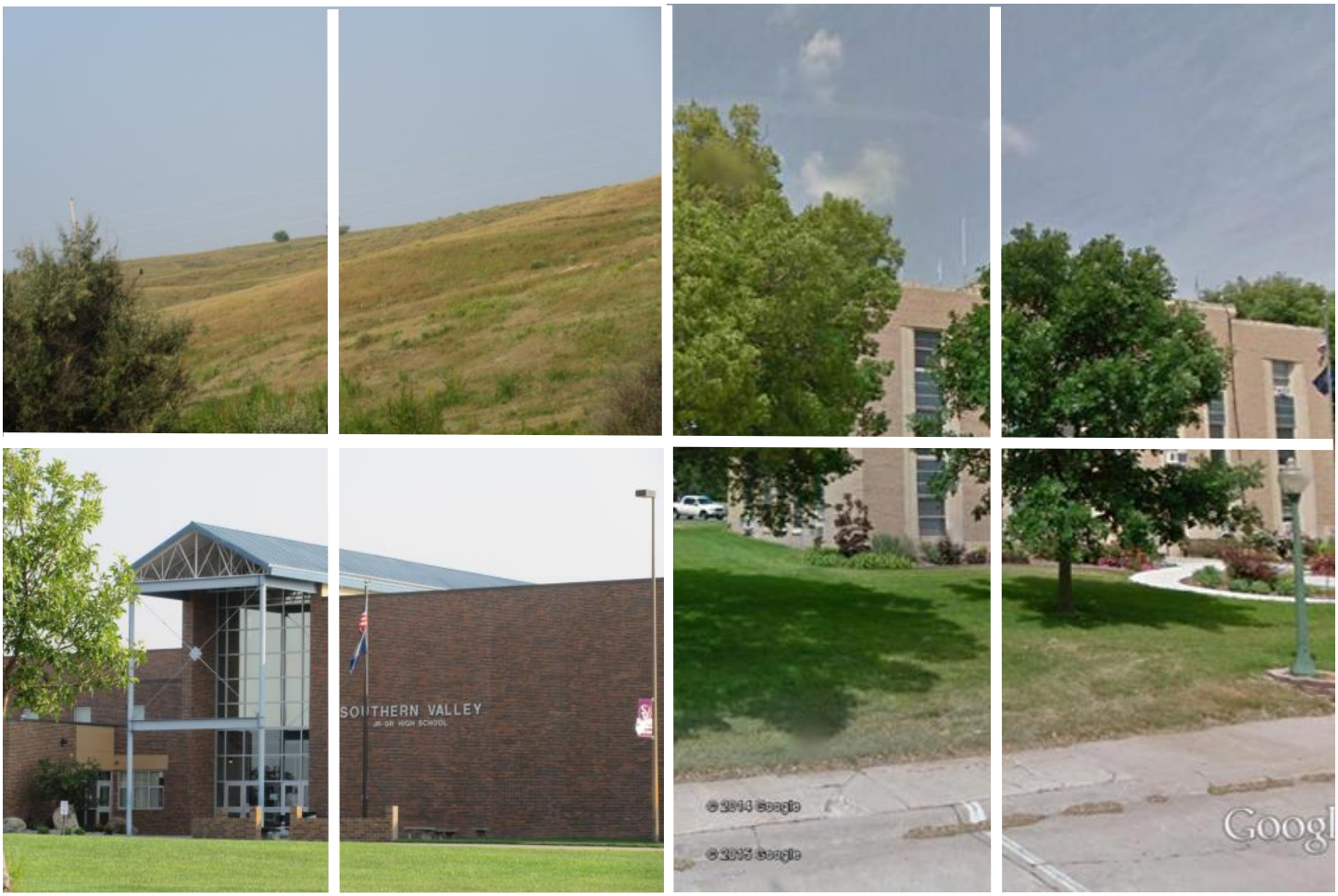

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Plan Participants

Board of Commissioners

Don Tegtman (Chairman)
Bill Lewis
Jerry Schroeder

County Personnel

Roger Powell	Zoning Administrator/ Emergency Manager
Kennis McClelland	Clerk/Election Commissioner/Register of Deeds
Melody L. Crawford	Assessor
Tom Patterson	County Attorney
Lance Harter	Highway Superintendent/Surveyor

Planning Commission

Bill Weaver
Randy Brown
Nick Brown
Dennis Tegtman
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In Association with

MARVIN PLANNING CONSULTANTS
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OLSSON ASSOCIATES

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Introduction

Location

Furnas County is located in far south central Nebraska. The county is bounded on the west by Red Willow County; on the north by Gosper County, Phelps County and Frontier County; on the east by Harlan County and on the south by Norton County in Kansas. The county has six highways located in and crossing the county including US Highways 34, 283 and 136, Nebraska Highways 47, 89 and 46. The county is home to the communities of Arapahoe, Beaver City (County seat), Cambridge, Edison, Hendley, Holbrook, Oxford, and Wilsonville.

History of Furnas County

The following information is a mixture of the community histories found at http://www.furnascounty.ne.gov/index_html?page=content/history.html and

The pride and enthusiasm that early settlers placed in locating the seat of local government was possibly nowhere more evident than in Furnas County. Events there showed just how strong the emotions could become.

When Robert W. Furnas became governor in 1873, the Legislature adopted an act to organize an area along the Kansas border and name this latest county in his honor. The influx of settlers that had preceded the Legislature's action had already resulted in the settlements of Arapahoe and Beaver City being established. So when the county's first organization election was held on April 8, 1873, ballots were cast at both sites.

Election results from Arapahoe were filed with the Secretary of State's office within the appointed time limit. The returns from Beaver City, however, were delayed en route to Lincoln because of a heavy snowstorm. As a result, Beaver City's ballots did not arrive until after the day on which the ballots were counted. The Secretary of State issued certificates of election of officials in Arapahoe and ruled that settlement to be the county seat. What followed was a series of court orders and bitter political fights between the settlers in the north and south parts of the county.

A court quickly ordered the Secretary of State to canvass the Beaver City votes and issue certificates of election to the candidates who received the highest vote from the combined

Table 1.1: Location Map
Furnas County

Source: Microsoft Street and Trips

returns of Arapahoe and Beaver City, and to designate as the county seat the site that received the greatest vote.

A second election was held the following October. This time, Beaver City was declared the victor. Inhabitants of Arapahoe continued to claim victory based on the April election. It took three years of legal challenges before the Supreme Court ruled that Beaver City was indeed the county seat. Continued dissention delayed the building of a courthouse until 1888.

The first courthouse stood for 60 years before being declared unsafe for occupancy in 1948. The courthouse was dismantled the following year and after the county offices were housed in various downtown buildings for two years, the current courthouse was dedicated on May 4, 1951.

Arapahoe

Arapahoe, population 1,140, is known as "the town where the hi-ways meet." Located in south central Nebraska, it is at the intersection of Highways 6-34 and Highway 283.

The Arapahoe Indians were honored when their tribal name was given to the first town in Furnas (formerly James) County. The town site was surveyed in 1871 on a tract of land between Elk and Muddy Creeks in the beautiful and productive Republican River Valley.

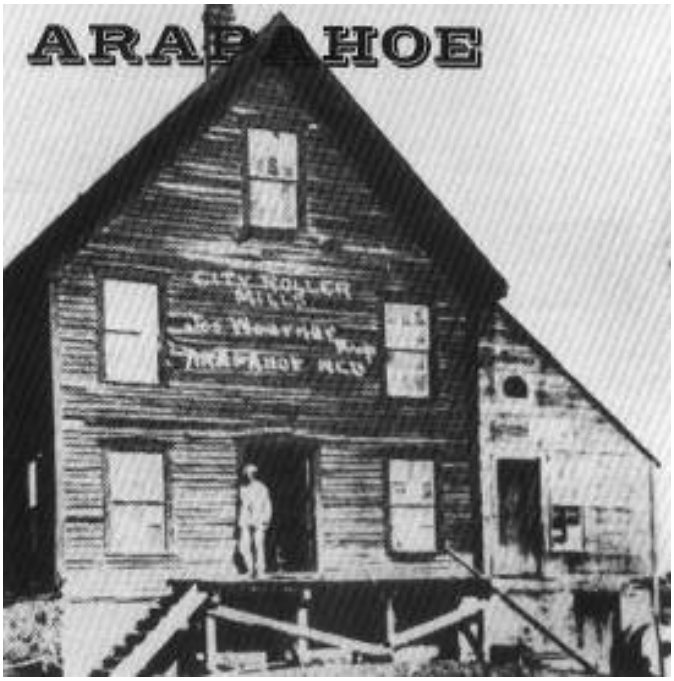
Introduction

George Love was named postmaster in the spring of 1872.

The town was laid out with a park at its center for activities such as band concerts, Chautauquas and picnics. A swimming pool and solarium were built with WPA (Works Progress Administration) labor during the depression in the 1930's. The tree-shaded park is still the center of activities with swimming, picnics and an occasional band concert enjoyed by many in the good old summertime.

Julia Love was the first teacher in a log structure with crude backless benches. Other buildings later housed the educational facility, with the present brick structures, manicured lawn, and new hard-surfaced track a beehive of activity during the school year.

In 1879 the newspaper "Arapahoe Pioneer" was established, and from 1895 to 1911, two papers were published weekly. One of them, "The Arapahoe Public Mirror," has continued and now has absorbed the newspapers of neighboring Edison and Holbrook.



An early-day fight with Beaver City for the county seat was settled by vote. (Some people suspected arson in a fire north of Arapahoe that kept many voters from the polls.) A more recent try was made to move the courthouse to the middle of Furnas County, locating it across the road from the Mid-County Golf course south of Arapahoe, but did not receive the necessary votes.

The town has seen many changes. The early transportation required livery stables (one aptly named "Hotel d' Hoss") and hotels where hearty meals were served to weary travelers. The arrival of the railroad made traveling much easier, with trains also used for shipping cream, eggs, and produce. Livestock was also moved to market with much less effort. The arrival of the "Tin Lizzie" required improvements of city streets, country roads, and the DLD (Detroit, Lincoln & Denver) Highway through Arapahoe, as well as need for gas stations and garages for repairs.

Finch's Store, a three-story brick structure on Nebraska Avenue, now houses the Furnas County Museum where one can view beautiful dishes, old furniture, tools, and clothing of yesteryear. During the 1971 Arapahoe centennial, a miniature log cabin was built just south of the museum, and words were put to music for Arapahoe's very own centennial song.

The Joseph Einstein Building (the second story having been the opera house) has been remodeled as a meeting place for "Arapahoe Senior Citizens, Inc."

In time of war, many young men of the area served their country in the armed forces, proud to defend their homeland. A grotto visited by many travelers, the "Shrine of Our Lady of Fatima" at St. Germanus Catholic Church, was built by Father Denis, who was a prisoner in a German concentration camp during World War II and later the pastor at Arapahoe.

The livelihood of most area residents is related to agriculture so the community has naturally suffered because of the poor economy. But, as in the past -- during the grasshopper plagues, drought of the 1930's, the flood of 1935 when the Republican River stretched from the foot of the bluffs to the railroad track -- the residents, both rural and urban, pull together to help each other out.

Arapahoe is very much alive and boasts a modern medical clinic, new public library, a low-cost housing project, a nursing home, and over 60 separate business places with friendly merchants.
"Arapahoe Heritage Days," an annual two or three-day celebration over July 4th, welcomes one and all to ball games, swimming, races, quilt show, dances, an ice cream social, a big parade, and fireworks to

celebrate our long and varied heritage.
Source: http://www.casde.unl.edu/history/counties/furnas/arapahoe/

Beaver City

Beaver City, county seat for Furnas County, is located on Beaver Creek not far from the Kansas border. This site was noted in the spring of 1872 by J.H. McKee and Struve as a "favorable point." However, they continued to scout the area for several months, returning to this site in October to plat the town. McKee was promptly joined by his business partner Robert Denham, who helped build the first store. By November 1 it was stocked with goods and opened for business. This building, also used as a post office, was where the first Furnas county court convened.

Other families soon joined the settlement; the Hadleys, Williams, Danforths, and Nicholsons. As more people arrived, Beaver City developed and grew. Furnas County's population also increased and soon there was a second village established several miles north.

A post office was requested soon after the town was platted, but there was no mail delivered until 1873. In the meantime, the mail was brought to town from Alma (25 miles away) each Sunday by one of the settlers. Later a carrier was hired and paid by subscription until the government route was established. C.A. Danforth was the first postmaster.

When the county organized in late 1873, Beaver City was one of the voting places designated by Governor Robert Furnas, for whom the county was named. Competing with Arapahoe for location of the county seat, Beaver City was chosen for the honor by the people. This is where it has remained. There have been three courthouses, the latest built in 1949.

The first sermon was preached in July 1873 by Dr. G.A. Hobson in the old "Valley Hotel." The first Sunday School was also established that year. The Presbyterians organized in 1874 and built their church in 1880. The Methodist Episcopal congregation was organized in 1875 and built their church in 1885. Thomas and Anna Williams were very instrumental in organizing both churches and the Sunday school in Beaver City.

In 1873-74 a grist mill was built west of town on Beaver Creek by David Lashley and Joseph Monell. Lashley became the sole owner, and the mill served the surrounding area for many years. Historically this site is important because George W.Norris, then a young lawyer, first conceived the idea of water power being converted into electricity for the use by rural Americans everywhere while chatting with Mr. Lashley as they stood near the mill race. Norris, who later married Pluma Lashley, was urged by his father-in-law to work to make this idea come about. Norris, who served in the U.S. House of Representatives for ten years (1903-13) and in the Senate for 30 years (1913-43), was instrumental in writing the bills that created the Tennessee Valley Authority (T.V.A.) in 1933 and the Rural Electrification Administration (R.E.A.) in 1935. Norris also helped author the constitutional amendment that established a unicameral (one house) legislature in Nebraska in 1935. The Norris' lived in the large Lashley home, which still stands in the city, and the senator maintained a Beaver City law office for many years. In later years he moved to McCook, where he lived out his life.

Our town has recorded some unique "firsts" in the field of medicine and aviation. Beaver City was the home of Dr. Frank Brewster, Nebraska's first flying doctor. Brewster bought a Curtis-Wright JN4D biplane in 1919. Purchased for $8,000, it arrived in Beaver City by rail in two large boxes. The plane was assembled and made its first flight on May 19, 1919, when 8,000 people gathered to see Wade Stevens, a young World War I veteran, take to the air for its test flight. "Doc" Brewster flew many missions of mercy throughout southwestern Nebraska and northwestern Kansas. His airplane was a familiar and comforting sight to farmers and ranchers of this area for many years.

Currently Beaver City is the home of Nebraska's first veterinarian to use a helicopter in his practice. Dr. Arthur Becker established a veterinary practice here in 1962, then built a unique, rounded Beaver Valley Animal Hospital in 1965 (the first of its kind). His

helicopter gives him great mobility and allows him to make calls quickly and efficiently.

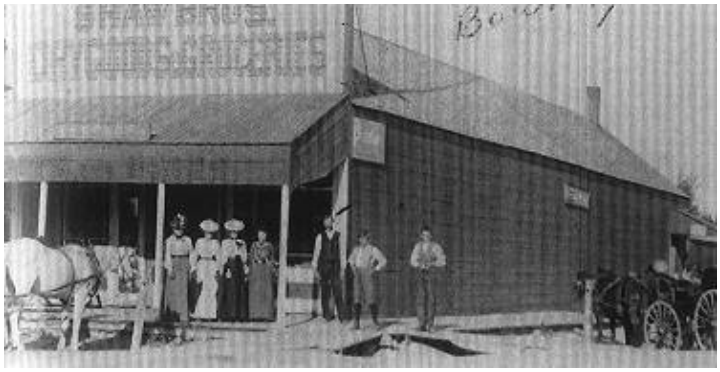
Down town businesses in Beaver City front on a picturesque town square with its Civil War monument and park benches under tall shade trees. The population that was as high as 1,100 in the 1920s is currently 775.
Source: http://www.casde.unl.edu/history/counties/furnas/beavercity/

Cambridge
Cambridge, in northwestern Furnas County, is on the gentle slope between the Republican River and Medicine Creek. Hiram Doing came in 1871, built a cabin, and named the place "Northwood." In 1874 a post office named "Medicine Creek" was established. Two years later Doing sold his claim to J.W.Pickle who laid out the town that people called "Pickletown." A dam on Medicine Creek and a sawmill with a corn burr for grinding grain were built. The mill served the area for many years, with improvements that included a four-story building on a solid stone foundation and modern equipment for improved flour-making. The mill was torn down in 1950 after being severely damaged by flood waters.

The Burlington Railroad reached the town in 1880. At that time the name was changed to "Cambridge." The station agent, W.H. Faling, also established "The Regulator," a large general store.

Cambridge was incorporated in 1885 with a population of over 200. The town's park on Medicine Creek was a gathering place for baseball games, G.A.R. reunions, Fourth of July, Chautauquas, and campers. While it has been damaged by floods, it has always been returned to its original beauty. Facilities include a new swimming pool in 1986 (to replace the one built in 1933), a golf course, archery, tennis, picnic area, one-room schoolhouse museum, horse arena, flower garden, and children's playground. The Cambridge Chamber of Commerce that started in 1888 as "the Board of Trade" now sponsors "Medicine Creek Days" each June. Activities include a barbecue, parade and outhouse races, and draws big crowds.

In 1874 a log schoolhouse was built with a dirt floor and branches for the roof. In 1878 a sod school was built and later a frame building, with the first brick structure completed in 1888. The present set of buildings serves over 400 students with an excellent course of educational opportunities as well as classes in adult education. Cambridge is proud of its high school athletic achievements. Starting with baseball, football was added in 1901. The football team won the state championship in 1920. It was later ruled that Clinton John was "ineligible to coach" since he had no degree and was not paid a salary. The football field was named in his honor in 1961.
The community established a number of churches in



the 1880s. Five presently serve the town: Catholic, Calvary Baptist, United Methodist, Lutheran, and Congregational UCC.

When Cambridge enjoyed its first boom in 1884, the newspaper, "The Monitor," was founded. Through several changes in ownership the name changed first to "Kaleidoscope," then to "The Cambridge Clarion" the name by which it is currently known. It serves as an important source of communications and history and is especially noted for its sports coverage.

Cambridge has had two disastrous floods. The Republican River flood of 1935 that took many lives and left much destruction, and a flash flood that roared down Medicine Creek in 1947. This quiet little stream, swelled by weeks of rain, took 13 lives and destroyed or damaged many homes and businesses. A dam authorized several years previously was then funded, with the project completed in 1949. The reservoir, named Harry Strunk Lake, irrigates 18,000 acres and provides a recreation area for water sports, fishing, and hunting.

Cambridge's Memorial Hospital, Cambridge Manor, and a Heritage Plaza make this the center for medical services. The growth of these facilities have been made possible by the presence of the medical staff and others dedicated to taking care of people.

The Butler Memorial Library, honoring "Pap" Butler, has a collection of over 13,000 books and periodicals. A museum started in 1938 has a large collection of Great Plains relics, birds, fossils, Indian artifacts, and

many local historical items.

The economic climate in Cambridge, with over 70 businesses, is healthy and ever-changing. The principal occupations are stock raising and farming. The town depends on the rural community, and shares in its financial ups and downs.

Cambridge has maintained a population of over 1,000 since the early 1930s. The 1980 census shows 1,206 residents. As it has been from early on, people are the most important factor in the community. We look back and try to imagine how early pioneers survived the Indian scares, sickness, drought, prairie fires, and floods. We look forward to the 21st Century in the hopes of leaving a legacy for the future generations who will call Cambridge "home."
Source: http://www.casde.unl.edu/history/counties/furnas/cambridge/

Edison
Thomas Edison may have been a very famous man and invented many things, but he is not the person for whom the town of Edison, Nebraska, is named.

Edison, in the eastern part of Furnas County, was named for the son of R.H. Rohr, one of the owners of the first store at that location. Rohr and Charles Draper established a general merchandising business. When Rohr was named postmaster, he needed to supply the name that was to be used. He chose to call it "Edison," for his son "Eddy."

The first white baby born in Furnas County was Rene Rohr White in Edison. Some names of early settlers in addition to Rohr, Draper, and White, include Osborn, Parmeder, Jones, Bard, and Shafer.

This settlement just kind of "happened" as western expansion pushed into Furnas County. The railroad also came through, but this was not what you would call a railroad town.

Edison was just a frontier town, with all businesses designed to attract travelers and newly-arriving settlers. Described as "a thriving town," it had an opera house, two hotels, a blacksmith, hardware store, and three churches.

Of the original churches, only the Christian Church, organized by Brother William Winters in 1889 has survived. The first pastor was John Stewart Miller. In recent years a new denomination called Holiness Church was organized.

In earlier times, many Indians passed through the area on their annual migration from their winter to summer hunting grounds. Some times they would set up their teepees in an encampment near the town and stay for a considerable time. They used the healing mud and water of Turkey Creek to care for wounded warriors.

After one battle, one Indian squaw found her way to the Osborn home, where she just sat by the stove. Later more Indians also came, causing some concern as to their intent. Finally one of the Osborn children put a bullet in the stove, which of course exploded. The Indians ran from the house and never came back.

The smallest schoolhouse in Nebraska was located south of Edison. It measures only 14-feet by 16-feet. Known as District 10, it was built in 1896 and closed in 1935. The building was moved into Edison and restored so it can be enjoyed by citizens and tourists.

The town was officially incorporated on January 3, 1907. Edison's peak population of 334 was recorded in 1910. The present count is near the 200 mark.

Edison's Farmers & Merchant's Bank opened in 1926. It weathered the Depression and hard times. Last year it purchased the Arapahoe Bank.

Every town located on the Republican River has horror stories to relate about the terrible flood of 1935. Since Edison was down stream, there had been some warnings, but people ignored them. They didn't believe that the water could get as high as it did. No one in Edison lost their lives, but the streets were under a foot or more of water.

In 1955 the Edison Co-op elevator was established. It

has now merged with Beaver City, Oxford, Holbrook, Elwood, and Hendley to form a larger co-op.

Most of the original businesses that were established when Edison was young are now gone. Some of them were no longer needed, like the blacksmithing and livery stable, while others burned down or just closed.

Edison has an active volunteer fire department. The electrical system operated by the village is supplied by NPPD. The natural gas system is supplied through Kansas-Nebraska Gas Company. The town is still "on the line" of the railroad through the area, operated by Burlington-Northern.

Edison had a homestead centennial in 1972, and celebrates "Market Days" on the second Saturday in September every year. This event brings a lot of people to town. Consider this your invitation to stop by.
Source: http://www.casde.unl.edu/history/counties/furnas/edison/

Hendley
There were herds of buffalo, antelope, deer, elk, and wild turkey roaming the country in 1872 when I.W. Meyers located a short distance west of what is now the town of Hendley. Soon other settlers took up homesteads. Meyers was appointed postmaster of the settlement that he named "Lynden." The little town took root as more people built homes and set up businesses.

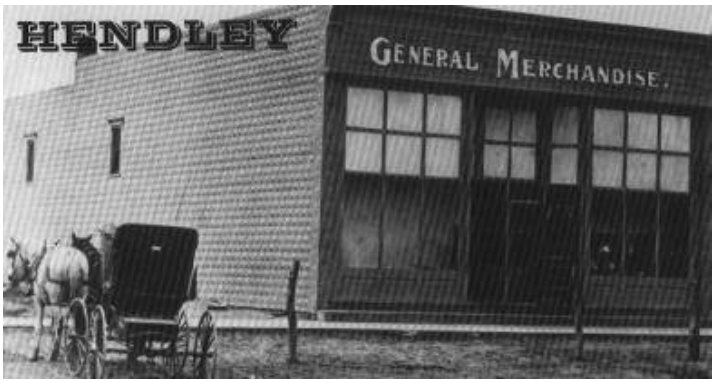
When the railroad came through the area in 1887, the station was named "Hendley" for the railroad conductor who wanted a town to be named for him. Although local sentiment was for it to remain Lynden, the railroad had its way, and soon the old name was all but forgotten. By this time the town had eight stores, livery barn, grain and stock market, hotel, two banks, and a drug store. Dr. John Wesley Thompson, who located in the community in 1888, recalled that at that time buffalo grass covered the plains and there were no well-made roads to be found.

The "Hendley Hustler" newspaper reported..."the town is situated on the Pueblo branch of the B&MR Railroad, in the Beaver Valley believed to be the richest and best valley in the state of Nebraska..." After listing the many names and businesses available, the editor added, "...the hardware block includes two store rooms and a capacious hall. The Leach building also contains a good hall where preaching was instituted immediately..." Several churches were organized, with the Methodist Church still active in the community.

The village of Hendley incorporated in 1906. By then it had a full array of businesses, among them the D.M.Perkins General Merchandise Store.

A story of the "American dream come true" is found in Hendley. The Perkins family came to Furnas County in 1893. They survived the drought and hard-times that hit the area then by working many hours at tending crops and a big garden. Mrs.Perkins and the children drove their buggy ten miles to Beaver City every Sunday, selling butter and eggs to cash customers. In 1900 the family traded their farm for a store in Hendley so the children would have better schooling.

Young Edwin Perkins began his entrepreneurial



career at age 11 after reading an ad which said, "Be a manufacturer. Mixer's Guide tells how. Write today." Soon he was concocting perfumes, flavorings, and medicines in the family kitchen. Another ad, "Start a print shop in your home -- Make money" added to the production of his products and expanded to include calling cards, sold through magazine ads and student agents. His Nix-O-Tine Tobacco Remedy launched a successful mail order business for Perkins Products. It was here that Perkins developed "Fruit Smack," a liquid fruit drink concentrate that led to the development of "Kool Aid." Perkins and his wife, Kitty, moved to Hastings where he continued to expand his business to include products which were sold under the "Onor Maid" label. In 1931 the business was so large that the family moved to Chicago where Perkins served as its president until 1956, when he sold the company to General Foods.

The village of Hendley is very small, with an assessed valuation of under $260,000. It is served by the Nebraska Public Power District. While services to the community were slow in coming, they are current

with most communities at this time.
The population is currently 45, when everybody is home, so Hendley is one of the smaller incorporated towns in Nebraska.

In his 1894 history of Hendley, Calvin Resler concluded, "...now fellow citizens, show us a town of more enterprise and less loafers won't you? But when you look for the latter, put on your glasses, for they are as scarce as toads in England. And may we close by saying that Hendley has a park as good as the best and her morals are as good as any town in the west."
Source: http://www.casde.unl.edu/history/counties/furnas/Hendley/

Holbrook
In the year 1862 Isaac Burton, upon leaving Fort McPherson where he had been a saddler for the cavalry, was on an exploration trip. He was impressed with the area where Deer Creek joins a bend of the Republican River and vowed to return one day and settle there. He returned eight years later in 1870. Along with a partner named H. Dice, he opened a trading post in a log cabin they built. They traded primarily in dried buffalo meat, sugar, flour, hay and corn, as well as guns and ammunition. This first permanent settlement became known as "Burton's Bend." A post office by that name was established in August 1872.

Furnas County was organized and its boundaries defined in February 1873. Apparently, the county seat didn't interest Burton or Dice, so the voting was between the neighboring towns of Arapahoe and Beaver City, more nearly in the center of the new county. Beaver City won.

The railroad came right through the area in the late 1870s. A village sprang up near the old trading post and quickly grew into a town, with all the traffic of the westward movement of settlers and hunting expeditions. The town's name was changed to "Holbrook" in 1881 in honor of a Chicago, Burlington, & Quincy Railroad official.

Burton and Dice continued in business until 1883, by which time the town was well established. Their abandoned building stood in that quiet wooded area for many years until the great Republican River flood of 1935 swept it away.

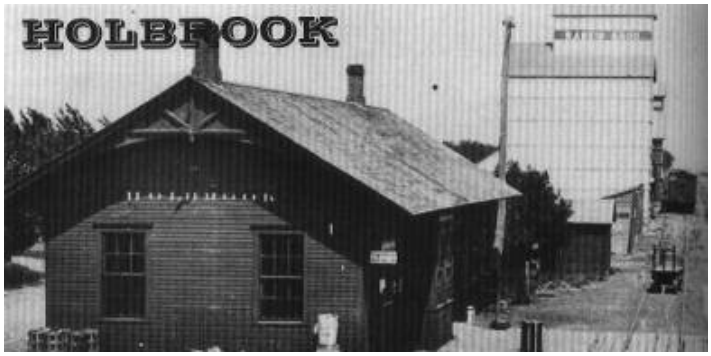
By 1895 the local businesses numbered more than 20. A fire on April 24, 1907, that started in the livery barn and spread rapidly throughout the town, wiped out most of the business section of Holbrook. The loss was estimated to be in excess of $10,000, which in those days was a lot of money. Some merchants gave up and left, but many stayed and rebuilt their businesses.

As with most Nebraska's rural communities, the town's population fluctuated -- some saying as high as 1,000 at one time. However, Perkey's Nebraska Places Names lists a peak population at 488 in 1930.

Holbrook was adversely effected by the Depression, drought, and the devastating Republican River flood in 1935. The town suffered even more during the 1940s when economics and World War II changed the entire life style of America.
Holbrook was once known as the "City of Beautiful Elms" but even that was not to endure when dutch elm disease ravaged the thousands of magnificent elm trees in Nebraska in the 1970s.
Our current population is recorded as 300 persons. Like many small towns, Holbrook is fighting to hold on. The town has survived many adversities and has hope for the future.
Source: http://www.casde.unl.edu/history/counties/furnas/holbrook/

Oxford
The beginning of Oxford was on December 20, 1879, when William Gillan was given his "final receivers receipt" and handed abstract title No. 767 for certain lands at the eastern edge of Furnas County. Nine days later William and his wife Caroline deeded a portion of this land to Jacob Struve for $200. Through a legal pre-arrangement, Struve had granted the Republican Valley Railroad Company (later to become part of the Chicago, Burlington & Quincy) a right of way over the land to construct their railroad.

Actually, railroad stakes had been driven on what



was to become the town site in October 1879, before the title for the land had been cleared. The arrival of

the first train as it crossed the Harlan County line into Oxford was greeted with a large crowd of onlookers, February 17, 1880. The main line still runs right through the middle of town, but the trains do not stop to leave-off mail or take on passengers.

It is believed that the first schoolhouse was a sod structure northwest of the present school yard. School was held in at least two other locations in Oxford before a brick building was completed at the present school site in 1887.

On June 10, 1880, the town site of Oxford was dedicated "for public use" by Jacob Struve, Clara Pease, and A.E. Tonzalin, trustees. There was, however, no great rush to build as two years later it was noted that there were only seven occupied dwellings in the town.

There are several versions of how Oxford got its name. Some claim it was a ford on the Republican River where oxen could cross and thus "Ox-ford." Others suggest it was probably named for Oxford University in England, while another version is that the railroad surveying crew named it for Oxford, Ohio.
In June 1884 a petition, signed by 23 citizens, was presented to the commissioners of Furnas County. With that action, the village of Oxford was formally incorporated. The first graduating class from Oxford High School walked across the stage in May 1894.

In 1906 the citizens of Oxford voted 92 to 32 in favor of establishing a water system. An electric system was installed in 1913 following a vote on the matter. A new larger schoolhouse was built in 1921, with a gymnasium and elementary school added later. The first paving, an oil mat on main street, was added in 1938.

Oxford has six active churches, some with organizations going back to the 1880s. Records indicate that even prior to that time, meetings and services were held in homes of early settlers. Our town also has many active organizations and clubs.
The town has two city parks, a good ball diamond, swimming pool, and a new library. The community also supports a nine-hole golf course, racquetball court, club house, and a theater.

Oxford's K-12 school is an accredited Class C district, with about 260 students. Our town has a modern 20-bed hospital with two doctors and a doctor's assistant. We also have a 59-bed nursing home.
Primarily a farming community, with a current population of over 1,200, Oxford has had many industries over the years. Recently the town lost two of them when the Oxford Cheese Factory was destroyed by fire in the spring of 1988, and the storm door and window plant closed. The Mid-Nebraska Retardation Center provides an educational facility and sheltered workshop north of town, as well as employment opportunities for people in the community.

The town of Oxford has weathered six business fires, plus grasshopper plagues, depressions, and dust storms. The community suffered the loss of many lives and material in the Flood of 1935, and had homes and businesses destroyed in a tornado in 1916. The community feels the effect of the recent farm economic problems. We are fortunate to have an active Chamber of Commerce and 52 business houses with a good line of merchandise.

The people of Oxford have a very positive attitude, and are looking forward to the future just as our forefathers did when they started our village over 100 years ago.
Source: http://www.casde.unl.edu/history/counties/furnas/Oxford/

Wilsonville
In 1872 Civil War veteran Alonzo Plumb and his sister, Louisa Jane from Wisconsin, staked separate claims near the present village of Wilsonville. They petitioned to locate a post office. In April 1873 Jane Plumb was commissioned postmaster of "Wild Turkey," so-named because of the abundance of turkeys roaming Beaver Creek Valley.

Later that year Pennsylvania-born Lorenzo Wilson moved here from Virginia City, Nevada, and established his homestead which included land within present day Wilsonville. After building his dugout, he began selling food, hardware, clothing, and other necessities to settlers and travelers. Increasing demands for supplies necessitated the building of a larger frame structure that he stocked

with $5,000 worth of merchandise. The locals met and proposed a new town name "...where merchant Wilson was established," and chose "Wilsonville." The Wild Turkey post office was moved to the new town and growth began.

February, 1887 saw the first issue of the "Wilsonville Review" that stated "...Wilsonville is a town of about 300 inhabitants...while last year there were but two or three houses, at present there are 70 or 80 homes. We are a booming town soon to have a railroad. We are fast growing into prominence and will soon reach the ranks of a city."

The first train arrived before year's end. Within two years the "Review" listed nearly 60 businesses.

When its population peaked at 500 in the 1920s Wilsonville boasted of being the largest livestock rail-shipping point in Nebraska. There are still large cattle operations today, but shipping is done primarily by truck.

In 1892 the Beaver Valley Harvest Home & Exposition Society began to "disseminate knowledge in agriculture, horticulture, arts and science, and for sociability." A park was laid out and a large exhibition hall erected. Each September merchants promoted a festival called "Harvest Home." Community residents competed for prizes in categories from quilting to livestock, with essays written by the high school graduating class. In 1895 it was estimated that 2,500 to 3,000 people attended. The exhibition hall is gone but in its place are rodeo grounds, a park, and ball diamond. Since 1967 the Saddle Club has sponsored an annual rodeo that brings in large crowds.

School was first held in the 1870s in a sod house. An early settler told of a time when 105 pupils were taught by one teacher! Wilsonville graduated seniors from 1896 to 1981. At that time the school district merged with Beaver Valley School in Lebanon, but maintains a K-6 school.

Rural mail delivery was established in 1903 and a telephone system in 1905, with rural lines completed the following years. The first automobile showed up in 1906, with cement sidewalks replacing boardwalks in 1908. Electricity began on a limited basis in 1916, with full service available in town by 1920, but rural homes waited until 1945-50. A waterworks system was completed in 1929, explaining the many fine buildings lost to fire in earlier years.

Wilsonville enjoyed the support of the surrounding rural areas. Precincts of Sherman, Lynden, Tyron, and Rockton each had several one-room schools that provided learning and social activities. Names like Sunflower, Anderson, and Bradley, plus the Kansas community of Devises, are often mentioned in news items.

Six Christian denominations have been active within the village of Wilsonville. In rural areas many groups met in homes, schools, and small one-room churches over the years.

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.

Today Wilsonville is a quiet farming and retirement community. The village population is 200, but it supports a good selection of businesses and services.
Source: http://www.casde.unl.edu/history/counties/furnas/Wilsonville/

The Comprehensive Development Plan

The Furnas 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 Furnas County. The 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 uses of land. The 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 Comprehensive Development Plan records where Furnas County has been, where it is now, and where it likely will be in the future.

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.

Data are collected to provide a snapshot of the past and present conditions within the county. 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 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 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 Furnas County Planning Commission, with the assistance and participation of the Furnas County Board of Commissioners; County staff; the Plan Review Committee and citizens of Furnas County. The time period for achieving the goals, programs, and developments identified in the Furnas County Comprehensive Plan is 20 years. However, the County should review the Plan annually and update the document every 10 years (2025), or when an 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.

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

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, "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
- County Engagement Chapter
- Population Statistics Chapter
- Housing Chapter
- Economics/Economic Development Chapter
- County Facilities Chapter
- Natural Resources/Environmental Chapter
- Energy Chapter
- Land Use Chapter
- Transportation Chapter
- Implementation Chapter
- Zoning and Subdivision Regulations

Planned growth will make Furnas 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.

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 Furnas County to closely monitor population, housing and economic conditions that may impact the County. 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 Plan for the future, to enhance the quality of life, and to raise the standard of living for all residents.

Government and Jurisdiction

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

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

2

Community Engagement

Public Participation

Public participation can be critical to a successful planning effort. Without public participation it is difficult to have a clear understanding of how the residents feel regarding the county. Solid public participation includes the uses of multiple types of community engagement techniques.

Solid public participation provides a solid foundation to develop policies concepts. The following paragraphs outline the different community engagement techniques used during the Furnas County project.

Community Engagement

Community engagement in Furnas County was intended to be a major component of the project and the process included multiple approaches. However, based upon a lack of participation during the MIndMixer component and the lack of public participation during recent Hazard Mitigation planning efforts and the new courthouse construction, it was determined additional input sessions prior to a draft Comprehensive Development Plan being available would gain very little for the project.

Some key elements will include:

- Education: Planning 101
- Use of a steering committee
- MindMixer: a virtual town hall discussion forum
- Public hearings

Steering Committee Meetings

With the assistance of Furnas County Planning Commission, County Board of Commissioners and county staff, a steering committee was formed 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.

Public Hearings

The Public Hearings are the final opportunity to for the public and staff to comment on the Comprehensive Plan prior to approval of the plan.

Goals and Poliices

Planning for the future land uses of the county 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 community, and providing a management tool enabling Furnas County citizens to achieve their vision for the future.

The Furnas County Comprehensive Plan provides a broadly painted picture for the community'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

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 Furnas 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 Furnas County must also act or implement the necessary steps involved in achieving this "vision".

Vision without action is merely a dream

Action without vision is just passing time

Vision with action can change the world

Joel Barker

Change is continuous, therefore Furnas County must decide specific criteria to be used to judge and manage change. Instead of reacting to development pressures after the fact, the community along with their strategic vision, can better reinforce the desired changes, and discourage negative impacts that may undermine the vision. A shared vision allows Furnas 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 Furnas 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. Furnas 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 community. In order to attain certain goals and/or policies within city 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.

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.

The goals and policies assure the Comprehensive Development Plan accomplishes the desires of the County. When followed, development proposals in the county should be evaluated as to their relationship with goals and policies. Therefore, "goals and policies" should be referred to as diligently as the Future Land Use Map or any other part of the Comprehensive Development Plan. Likewise, they should be current, in order to reflect the attitudes and desires of the County and its residents.

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.

Furnas County Vision and the Plan

The Furnas County Comprehensive Development Plan provides a broadly painted picture for the community'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 Furnas County.

The core promise embedded in the Furnas County Plan 2016 is designed to maintain and enhance the heath, safety and welfare of the community 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 the Furnas County community.

Furnas County Plan Goals and Policies

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

Goals are intended as a long-range desire; however, as the Plan is implemented and different things in the world around Furnas 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 Profile

Population Profile

Population is the basis for understanding past and existing conditions; while applying these to the future. It is critical for Furnas County, including the decision-makers to understand where the county has been, where it is and where it appears to be going.

Population drives all of the major components making up the county including housing, local employment, economic, and the fiscal stability of the county. Historic population projections assist in determining future housing, retail, medical, employment and educational needs within Furnas 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.

Population Trends and Analysis

Table 3.1 contains the historic population for Furnas County, and the incorporated communities in Furnas County, and the unincorporated areas, between 1980 and 2010. The data provides a look at where Furnas County has been and allows for the eventual projection of populations in the county.

The 2010 population shows the Furnas County population at 4,959 people. The population indicate a continued decrease in population from 1980 by 365 people or –6.9%. The county has seen a continual decrease in population since 1980. However, this declining trend has been continual since the County's peak population in 1900 (12,373 people).

Table 3.1: Population Trends and Analysis Furnas County and Communities 1980 to 2010

Community	1980	1990	2000	2010	% Change 2000 to 2010	% Change 1980 to 2010
Arapahoe	1,107	1,001	1,028	1,026	-0.2%	-7.3%
Beaver City	775	707	641	609	-5.0%	-21.4%
Cambridge	1,206	1,107	1,041	1,063	2.1%	-11.9%
Edison	210	148	154	133	-13.6%	-36.7%
Hendley	39	42	38	24	-36.8%	-38.5%
Holbrook	267	233	225	207	-8.0%	-22.5%
Oxford	1,109	949	876	779	-11.1%	-29.8%
Wilsonville	189	136	118	93	-21.2%	-50.8%
Incorp. Areas	4,902	4,323	4,121	3,934	-4.5%	-19.7%
Unincorp. Areas	1,584	1,230	1,203	1,025	-14.8%	-35.3%
Furnas County	6,486	5,553	5,324	4,959	-6.9%	-23.5%

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

Overall, the population decreases have been the result of losses in all aspects of the county; the unincorporated areas and the incorporated communities.

Migration Analysis

Migration Analysis is an approach 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.

Table 3.2: Migration Analysis Furnas County 1980 to 2010

Time Period	Total Change (persons)	Natural Change (persons)	Total Migration (persons)
1980-1989	(933)	(357)	(576)
1990-1999	(229)	(405)	176
2000-2009	(365)	(292)	(73)
Total	(1,527)	(1,054)	(473)

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

Table 3.2 indicates the primary issue with the decreasing population in Furnas County is more people dying off as opposed to being born. Overall from 1980 to 2010, 2/3 of the population decrease is attributed to more people dying as opposed to being born. Between 1990 and 1999, the county saw a net in-migration which lessened the degree of the overall population decrease.

Between 1980 and 2010, the county lost, overall, 1,527 people; however, during the same period there was a net of 473 people that moved away. The period where the county saw the greatest exodus was from 1980 to 1989 when 576 people moved away. This exodus equaled one person in 12 left Furnas County for somewhere else.

Since 1980, Furnas County has seen a slowing in the natural changes and migration. Between 1980 and 1989, the county had 357 more deaths than births with 576 moving away. The period 1990 to 1999 saw the natural change worsen slightly but the migration turned around and saw 176 people move into the county. Finally, 2000 to 2009 saw the natural change improve significantly and the out-migration saw only 73 move away.

Between 2000 and 2010, the county saw 73 move away, but Table 3.3 indicates several critical age groups moved into the county

Age Structure Analysis

Age structure is an important component of population analysis. By analyzing age structure, one can determine additional dynamics affecting the population of Furnas County.

Each age group affects the population in a number of different ways. For example, the existence of larger young age groups (20-44 years) means there is a greater ability to sustain future population growth compared to the larger older age groups. Understanding what is happening within the age groups of the community's population is necessary to effectively plan for the future.

Table 3.3: Age and Sex Characteristics Furnas County 2000 to 2010

Age	2000	2010	2000-2010	
	Male and Female	Male and Female	Cohort Change	% Change
0-4	300	257	257	-
5-9	363	313	313	-
10-14	362	353	53	17.7%
15-19	372	332	-31	-8.5%
20-24	172	155	-207	-57.2%
25-29	218	203	-169	-45.4%
30-34	259	194	22	12.8%
35-44	738	518	41	8.6%
45-54	725	744	6	0.8%
55-64	549	763	38	5.2%
65-74	582	521	-28	-5.1%
75 & older	684	606	-660	-52.1%
Total	**5,324**	**4,959**	**-365**	**-6.9%**

U.S. Census Bureau 2000, 2010

Table 3.3 Contains the age group structure for Furnas County in 2000 and 2010. The examination of population age structure allows for an understanding of where some of the population shifts are occurring. These data allow for a better understanding of what could occur in the future.

Realizing how many persons are in each age group, and at what rate the age groups are changing in size, will allow for informed decision-making in order to maximize the future use of resources. As shown in Table 3.3, significant changes between 2000 and 2010 occurred within a number of different age groups.

A review of population by this method permits one to undertake a detailed analysis of which specific groups are moving in and out of the community. Negative changes in a group indicates out-migration or a combination of out-migration and deaths.

Furnas County saw growth in seven age groups. The 0 to 4 and 5 to 9 groups always indicate an increase, since these persons were not born when the 2000 Census was completed. Outside of the 2010 age groups of 0-4 and 5-9 years, the other increase were in the 10-14 (2010), the 30-34 (2010), the 35-44 (2010), the 45-54 (2010), and the 55-64 (2010). Overall, there was an increase of 730 persons in these age groups. When you eliminate the first two younger populations, there were 160 people that moved in during this period. This population increase consisted primarily of family aged adults and children which is critical to the county's long term survival.

Table 3.4: Positive Age Groups Furnas County 2000 to 2010

2000 Age Group	Number	2010 Age Group	Number	Change
NA	NA	0 - 4 years	257 persons	+ 257 persons
NA	NA	5 - 9 years	313 persons	+ 313 persons
0-4 years	300 persons	10-14 years	353 persons	+ 53 persons
20-24 years	172 persons	30-34 years	194 persons	+ 22 persons
25-34 years	477 persons	35-44 years	518 persons	+ 41 persons
35-44 years	738 persons	45-54 years	744 persons	+ 6 persons
45-54 years	725 persons	55-64 years	763 persons	+ 38 persons
Total Change				**+ 730 persons**

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

There were five age groups from 2000 showing declines by 2010. The group with the greatest loss was the 75 years + (2010) which lost 660 persons over the period. The majority of this loss is attributed to the dying population base shown in Table 3.2.
Overall, Furnas County has had a unique population

pattern occur during this ten year period. Solid in-migration from family age groups but then still being negatively impacted by the out-migration of the elderly and post high school youth/adults and mortality rate of the elderly.

TABLE 3.5: NEGATIVE AGE GROUPS FURNAS COUNTY 2000 TO 2010

2000 Age Group	Number	2010 Age Group	Number	Change
5 - 9 years	363 persons	15 - 19 years	332 persons	- 31 persons
10 - 14 years	362 persons	20 - 24 years	155 persons	-207 persons
15 - 19 years	372 persons	25 - 29 years	203 persons	- 169 persons
55 – 64 years	549 persons	65–74 years	521 persons	- 28 persons
65 years +	1,266 persons	75 years +	606 persons	- 660 persons
Total Change				**- 1,095 persons**

Source: U.S. Census Bureau 2000, 2010

Median Age and Dependency Ratio

The median age in Furnas County increased from 43.5 years in 2000 to 47.4 years in 2010. This increase equaled 3.9 years or an increase of 9.0%.

TABLE 3.6: MEDIAN AGE/DEPENDENCY RATIO FURNAS COUNTY 2000 TO 2010

2000		2010	
Under 18 years of age	1,285	Under 18 years of age	1,055
% of total population	24.1%	% of total population	21.3%
Total 65 yrs and older	1,266	Total 65 yrs and older	1,127
% of total population	23.8%	% of total population	22.7%
Median Age	43.5	Median Age	47.4
Total Females	2,769	Total Females	2,536
Total Males	2,555	Total Males	2,423
Dependency Ratio	0.92	Dependency Ratio	0.79
Total Population	**5,324**	**Total Population**	**4,959**

Source: U.S. Census Bureau

Table 3.6 indicates the dependency ratios for 2000 and 2010 in Furnas County. The proportion of persons less than 18 years of age decreased by 17.9% between 2000 and 2010; while those aged 65 years and older decreased by 11.0% overall.

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

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

In 2000, Furnas County had a Dependency Ratio of 0.92 (47.9%/52.1%); however, by 2010 the Ratio had decreased to 0.79 (44.0%/56.0%). The population base within the those dependent age groups has declined at slower rate than the overall population.

ETHNICITY

Furnas County and during the past decade has seen a major shift in the ethnicity within the county.

TABLE 3.6: POPULATION BY ETHNICITY FURNAS COUNTY 2000 TO 2010

Source: US Census 2000, and 2010

Race	2000		2010	
	Number	% of total	Number	% of total
White, not Hispanic	5,229	98.2	4,804	96.9
Black	4	0.1	10	0.2
Am. Indian & AK. Native	22	0.4	20	0.4
Asian & Pacific Islander	14	0.3	12	0.2
Other, not Hispanic	17	0.3	59	1.2
Hispanic	61	1.1	132	2.7
Mexican	48	0.9	110	2.2
Puerto Rican	0	0.0	2	0.0
Cuban	0	0.0	0	0.0
Other Hispanic	13	0.2	20	0.4

The dynamic ethnicity adds to the overall population can be complex and can cause considerable growing pains and cultural shifts regardless of the ethnic background. The shifts seen in Furnas County are large considering the Hispanic population

increased by 116.0%. The majority of this increase was traced to increases in Arapahoe, Cambridge, and Oxford. These three communities accounted for 61 (86%) of the 71 new Hispanics in 2010. The largest part of this increase was in Arapahoe.

In addition, the White population saw an 8.1% decrease overall, which equaled 425 less 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 Furnas County to estimate the potential population in future years by looking at past trends. By scrutinizing 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 Furnas 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 Furnas 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 Furnas County, three different trend lines were reviewed: 1960 to 2010, 1990 to 2010, and 2000 to 2010. A review of these trend lines indicates Furnas County will see varied levels of decreasing population between now and 2040. The following projections summarize the decennial population for Furnas County through 2040.

Furnas County Trend Analysis

Year	1990 to 2010
2010	4,959 persons
2020	4,694 persons
2030	4,443 persons
2040	4,205 persons

Year	1980 to 2010
2010	4,959 persons
2020	4,570 persons
2030	4,211 persons
2040	3,881 persons

Year	2000 to 2010
2010	4,959 persons
2020	4,619 persons
2030	4,302 persons
2040	4,007 persons

Year	1960 to 2010
2010	4,959 persons
2020	4,605 persons
2030	4,276 persons
2040	3,971 persons

Cohort Survival Analysis

Cohort Survival Analysis reviews the population by different age groups and sex. The population age groups are then projected forward by decade using survival rates for the different age cohorts. This projection model accounts for average birth rates by sex and adds the new births into the future population.

The Cohort Survival Model projection indicates Furnas County's population will decline slightly in 2020 and then begin a steady increase each decade through 2040. The following projection for Furnas County is based on applying survival rates to age cohorts, but does not consider the effects of either in-migration or out-migration.

Furnas County Cohort Survival Analysis

Year	Cohort Survival Model
2020	4,436 persons
2030	4,534 persons
2040	4,496 persons

Summary of Population Projections

Using the modeling techniques discussed in the previous paragraphs, a summary of the two population projections for Furnas 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. All three projections forecast a continuing decline in population for Furnas County through the year 2040.

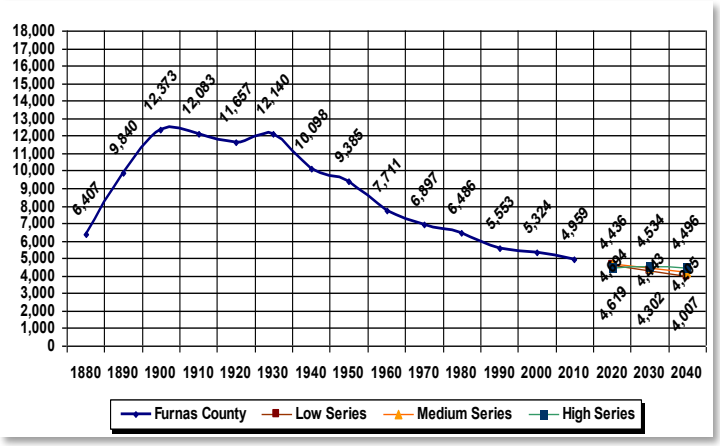
Year	Low = *2000 to 2010*
2010	4,959 persons
2020	4,619 persons
2030	4,302 persons
2040	4,007 persons

Medium = 1990 to 2010
2010 4,959persons
2020 4,694 persons
2030 4,443 persons
2040 4,205 persons

High = Cohort Analysis
2010 4,959 persons
2020 4,436 persons
2030 4,534 persons
2040 4,496 persons

Figure 3.1 reviews the population history of Furnas County between 1880 and 2010, and identifies the three population projection scenarios into the years 2020, 2030 and 2040. Figure 3.1 indicates the peak population for Furnas County occurred in 1900 with 12,373 people. Throughout the history of Furnas County, the population has had several peaks and valleys.

FIGURE 3.1: POPULATION AND PROJECTIONS
FURNAS COUNTY 1880 TO 2040

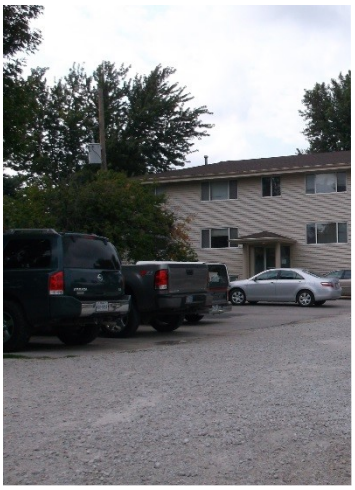


Source: Nebraska Department of Economic Development, Marvin Planning Consultants

As stated previously, the projections have been developed from data and past trends, as well as present conditions. A number of external and internal demographic, economic and social factors may affect these population forecasts. Furnas County should monitor population trends, size and composition periodically in order to understand in what direction their community is heading. Furnas County's greatest population threats will continue to be out-migration of youth, and strategies should be developed to further examine and prevent this phenomenon.








4

Housing Profile




Housing Profile

The Housing Profile identifies existing housing characteristics and projected housing needs for residents of Furnas 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.

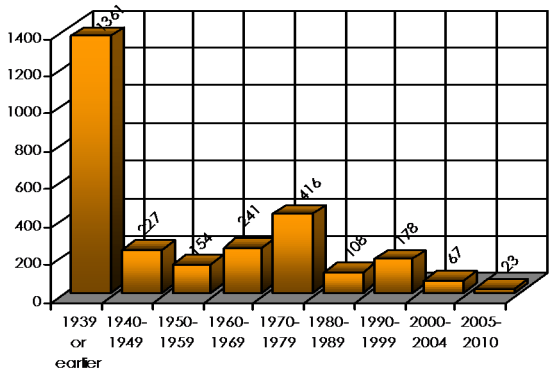
The profile examines the composition of owner-occupied and renter-occupied units, including vacant units. Evaluating this information is critical in determining where certain burdens may be found in Furnas County.

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 Furnas County.

Age of Existing Housing Stock

An analysis of the age of the housing stock reveals 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 Furnas County.

Figure 4.1: Age of Existing Housing Stock Furnas County 2010



Source: U.S. Census Bureau 2010

Figure 4.1 indicates 1,361 homes or 49.0% of Furnas County's 2,775 total housing units, were constructed prior to 1940. This likely consists of older well-kept homes as well as several homes in need of repair or demolition. This statistic is not unusual in the rural counties of Nebraska. Furnas County saw very positive construction activity between 1960 and 1980 with 657 (23.7%) homes constructed. This was especially true between 1970 and 1980 saw 416 (15.0%) new homes built during the decade. These data indicate the economy was relatively good during these decades.

Approximately 87% of all housing units in Furnas County were constructed prior to 1980. Due to the age of these homes, there may be a tremendous need for special weatherization programs in the community to bring these homes up to current energy efficiency standards.

Table 4.1: Community Housing Trends Furnas County 2000 to 2010

Selected Characteristics	2000	2010	% Change 2000-2010
Population	5,324	4,959	-6.9%
Persons in Household	5,190	4,878	-6.0%
Persons in Group Quarters	134	81	-39.6%
Persons per Household	2.28	2.23	-2.2%
Total Housing Units	2,730	2,721	-0.3%
Occupied Housing Units	2,278	2,185	-4.1%
Owner-occupied units	1,745	1,619	-7.2%
Renter-occupied units	533	566	6.2%
Vacant Housing Units	452	536	18.6%
Owner-Occupied vacancy rate	5.7%	3.1%	-45.6%
Renter-Occupied vacancy rate	9.7%	12.8%	32.0%
Single-family Units	2,390	2,420	1.3%
Duplex/Multiple-family units	188	241	28.2%
Mobile Homes, trailer, other	152	114	-25.0%
Median Gross Rent - 2000-2010			
Furnas County	$314	$457	**45.5%**
Nebraska	**$491**	**$632**	**28.7%**
Median Value of Owner-Occupied Units - 2000-2010			
Furnas County	$37,300	$55,700	**49.3%**
Nebraska	**$88,000**	**$119,700**	**36.0%**

Source: U.S. Census Bureau 2000 and 2010

Housing Trends

Table 4.1 identifies several different housing trends in Furnas County. The Table indicates the breakdown between owner- or renter-occupied housing as well as the number of people living in Group Quarters. Examining these type of housing trends allow for a better understanding of the overall diversity of the population and their quality of life within Furnas County.

Persons in Households/Group Quarters

In 2010 there were 312 fewer people living in households than in 2000, this represents a change of –6.0%. The decrease in persons in households is slightly less than the actual population decrease seen between 2000 and 2010.

Between 2000 and 2010, the number of people living

in group quarters went from 134 people in 2000 to 81 in 2010 a change of –39.6%. It is likely this sharp decline in the Group Quarters category was due to the losses in the older population groups (based upon the changes seen in the natural population changes).

Persons per Household

Table 4.1 also includes the number of persons per household. The average persons per household in Furnas County decreased from 2.28 to 2.23 persons. The trend nationally has been towards a declining household size; however, the person per household in Furnas County is similar to the surrounding counties:

- Red Willow County has 2.29 persons per household
- Frontier County has 2.26 persons per household
- Gosper County has 2.36 persons per household
- Phelps County has 2.37 persons per household
- Harlan County has 2.22 persons per household
- Norton County, KS has 2.24 persons per household
- Decatur County, KS has 2.09 persons per household
- Phillips County, KS has 2.29 persons per household

Occupied vs. Vacant Housing Units

Occupied housing units in the county had a 4.1% decrease from 2000 to 2010; this equaled a total lose of 93 occupied units in 2010. During this same period, vacant housing units increased from 452 in 2000 to 536 in 2010, or 18.8%. The occupancy type with the highest vacancy rate for both 2000 and 2010 was renter-occupied units at 9.7% and 12.8% respectively.

Median Gross Rent

Median gross rent in Furnas County increased from $314 per month in 2000 to $457 per month in 2010, or 45.5%. The State's median monthly gross rent increased by 28.7%. This indicates Furnas County has seen gross rent increase considerably more than the state. However, the County's Median Gross Rent is still considerably less than the State.

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 Furnas County's rents exceeded the rate of inflation for the 10-year period. Thus, Furnas County tenants were paying more in monthly rents in 2010, in terms of real dollars, than they were in 2000, on average. Landlords were also making more on their investment.

Median Value of Owner-occupied Units

The Median value of owner-occupied housing units in Furnas County increased from $37,300 in 2000 to $55,700 in 2010 and represents an increase of 49.3%. The median value for owner-occupied housing units in the state showed an increase of 36.0%. Housing values in Furnas County again exceeded the pace seen statewide. However, the Median Value of an owner occupied unit in Furnas County is 1/2 of the state median.

In comparison to the CPI, the local value of owner-occupied housing increased at a rate nearly 1.75 times higher than the CPI. This indicates housing values in the community actually were worth considerably more in 2010 compared to 2000 dollars.

Tenure of Households by Selected Characteristics

Table 4.2 shows tenure (owner-occupied and renter-occupied) of households by number and age of persons in each housing unit. Analyzing these data gives Furnas County the opportunity to determine where there may be a need for additional housing.

2000

The largest section of owner-occupied housing in Furnas County, based upon number of persons, was two person households, with 737 units, or 42.2% of the total owner-occupied units. By comparison, the largest household size for rentals was the single person households which had 264 renter-occupied housing units, or 49.5% of the total renter-occupied units.

Furnas County was comprised of 1,595 1-or 2-person households, or 70.0% of all households. Households having 5-or more persons comprised only 7.6% of the owner-occupied segment, and 8.5% of the renter-occupied segment. Countywide, households of 5-or more persons accounted for 177 units, or 7.8% of the total.

In 2000, the age cohorts representing the largest home ownership group was 75 and older. Of the total residents living in owner-occupied housing units, 19.7% were over 75 years of age. This group was closely followed by the 45 to 54 years group with 19.2%. Overall, 73.3% of all owner-occupied units were owned by individuals 45 years and older; with nearly 40.0% of the total being 65 years and over.

2010

In 2010, the largest section of owner-occupied housing in Furnas County remained with the two-person household, with 729 units, or 45.0% of the total

owner-occupied units; a decrease of 1.1% over 2000. By comparison, the largest household size for rentals was the single person households with 292 renter-occupied housing units, or 51.6% of the total renter-occupied units; a change of 10.6% over 2000. The renter-occupied group having the largest percentage increase was the four-person households with a 18.2% increase.

In 2010, the age cohorts representing the largest home ownership group was those 55 to 64 years. Of the total residents living in owner-occupied housing units, 23.9% were between 55 and 64 years of age. The 45 to 54 years cohort was a close second with 20.7% of the total owner-occupied units.

Furnas County was comprised of 1,613 1-or 2-person households, or 73.8% of all households; which represents an increase of 1.1% from 2000. Households having 5-or more persons comprised 9.0% of the owner-occupied segment, and 7.1% of the renter-occupied segment. Countywide, households with 5-or more persons accounted for 187 units, or 8.6% of the total. The total number of units increased by 10 units or 5.6%.

The renter occupied housing was again dominated by those 75 years and older with 23.3%. The closest age group was those between 45 and 54 years with 17.1% of all rental units.

Substandard Housing

According to the U.S. Department of Housing and Urban Development (HUD) guidelines, housing units lacking complete plumbing or 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.

TABLE 4.2: HOUSEHOLD CHARACTERISTICS
FURNAS COUNTY 2000 TO 2010

Householder Characteristic	2000				2010				O.O.	R.O.
	Owner-Occupied	% O.O	Renter-Occupied	% R.O	Owner-Occupied	% O.O	Renter-Occupied	% R.O	Percent Change	
Tenure by Number of Persons in Housing Unit (Occupied Housing Units)										
1 person	477	27.3%	264	49.5%	470	29.0%	292	51.6%	-1.5%	10.6%
2 persons	737	42.2%	117	22.0%	729	45.0%	122	21.6%	-1.1%	4.3%
3 persons	203	11.6%	52	9.8%	140	8.6%	47	8.3%	-31.0%	-9.6%
4 persons	196	11.2%	55	10.3%	133	8.2%	65	11.5%	-32.1%	18.2%
5 persons	84	4.8%	34	6.4%	80	4.9%	26	4.6%	-4.8%	-23.5%
6 persons or more	48	2.8%	11	2.1%	67	4.1%	14	2.5%	39.6%	27.3%
TOTAL	**1,745**	**100.0%**	**533**	**100.0%**	**1,619**	**100.0%**	**566**	**100.0%**	**-7.2%**	**6.2%**
Tenure by Age of Householder (Occupied Housing Units)										
15 to 24 years	21	1.2%	39	7.3%	18	1.1%	42	7.4%	-14.3%	7.7%
25 to 34 years	148	8.5%	104	19.5%	105	6.5%	87	15.4%	-29.1%	-16.3%
35 to 44 years	296	17.0%	110	20.6%	204	12.6%	84	14.8%	-31.1%	-23.6%
45 to 54 years	335	19.2%	65	12.2%	335	20.7%	97	17.1%	0.0%	49.2%
55 to 64 years	269	15.4%	48	9.0%	387	23.9%	67	11.8%	43.9%	39.6%
65 to 74 years	332	19.0%	44	8.3%	274	16.9%	57	10.1%	-17.5%	29.5%
75 years and over	344	19.7%	123	23.1%	296	18.3%	132	23.3%	-14.0%	7.3%
TOTAL	**1,745**	**100.0%**	**533**	**100.0%**	**1,619**	**100.0%**	**566**	**100.0%**	-7.2%	6.2%

Source: U.S. Census Bureau 2000 and 2010

TABLE 4.3: SUBSTANDARD HOUSING CONDITIONS FURNAS COUNTY 2000 TO 2010

Characteristics	Furnas County		State of Nebraska	
2000 Units Lacking Complete Plumbing Facilities	11	0.5%	6,398	0.9%
2000 Units with More Than One Person per Room	44	2.0%	17,963	2.5%
2010 Units Lacking Complete Plumbing Facilities	0	0.0%	2,540	0.3%
2010 Units with More Than One Person per Room	7	0.3%	12,201	1.5%
Substandard Units				
2000 Total	55	2.4%	24,361	3.1%
2010 Total	7	0.3%	14,741	1.9%

Source: U.S. Census Bureau 2000 and 2010

These criteria when applied to Furnas County indicate 55 housing units, or 2.4% of the total 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 44 units.

In 2010 the total number of substandard housing units decreased to seven units. However, the only contributing factor was overcrowding. Comparing Furnas County to the state of Nebraska as a whole, the percent of substandard housing units in Furnas County was less than the state as a whole 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 these data overestimate 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 4.1

Provide quality housing throughout the county.

Housing Policies and Strategies

H-4.1.1 The county should work with local agencies to provide quality housing.

H-4.1.2 A program to identify substandard housing units throughout Furnas County should be a priority and substandard housing units should be repaired or demolished.

H-4.1.3 The County should continually work with each community as they strive to provide better housing within the corporate limits.

Housing Goal 4.2

Affordable housing should be available throughout the county.

Housing Policies and Strategies

H-4.2.1 The County should work with agencies and funding sources like CDBG to offset development costs in order to bring the overall cost of housing down.

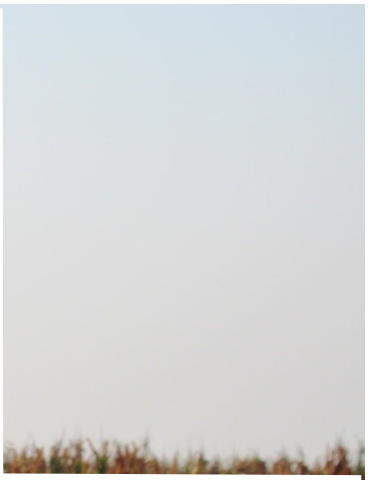
H-4.2.2 The county should continue to focus on affirmatively furthering fair housing throughout the entire county area.

H-4.2.3 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-4.2.4 Support all funding mechanisms available to effectively lower the cost of development and housing.

H-4.2.5 The County should continually work with each community as they strive to provide better housing within the corporate limits.

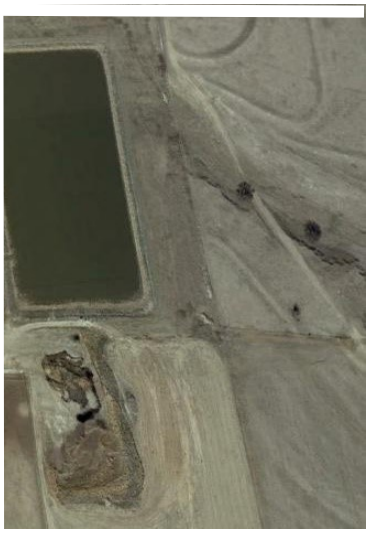



5

Economic Profile





Economic and Employment Profile

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

Income Statistics

Income statistics for households are important for determining the earning power of households in a county. The data presented here show household income levels for Furnas 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).

Table 5.1 indicates the number of households in each income range for Furnas County for 2000 and 2010. In 2000, the household income range most commonly reported was $35,000 to 49,999, which accounted for 19.7% of all households. Within the state of Nebraska the income range most reported statewide was the $50,000 to $74,999.

By 2010, the income range reported most was still the $35,000 to 49,999 which accounted for 16.9% of the total. The statewide income range was still the $50,000 to $74,999 range. There was minimal growth in the middle range of incomes.

Those households earning less than $15,000 decreased from 18.2% in 2000 to 14.5% in 2010. These household groups account for the poorest of the poor in the county. The decrease between 2000 and 2010 was 14.9%, which indicates some improvement.

The median household income for Furnas County was $32,351 in 2000, which was 82% of the State median income. By 2010, the median household income increased to $38,314 or an increase of 18.4% and was still less than the state Median Income. In addition, the median household income in Furnas County was at 80% of the state's median household income. Thus the gap between Furnas County and the state of Nebraska was getting larger.

The CPI for this period was 23.6%, indicating household incomes in Furnas County were growing at a slower rate than nation. Households were actually earning less in real dollars in 2010 than in 2000.

Table 5.1: Household Income
Furnas County 2000 to 2010

Household Income Ranges	2000				2010			
	Furnas County	% of Total	State of Nebraska	% of Total	Furnas County	% of Total	State of Nebraska	% of Total
Less than $10,000	242	10.6%	55,340	8.3%	165	7.7%	47,902	6.8%
$10,000 to $14,999	216	9.5%	43,915	6.6%	218	10.1%	41,039	5.8%
$15,000 to $24,999	439	19.2%	98,663	14.8%	284	13.2%	82,906	11.8%
$25,000 to $34,999	455	19.9%	97,932	14.7%	335	15.6%	83,822	11.9%
$35,000 to $49,999	429	18.8%	122,654	18.4%	372	17.3%	109,525	15.6%
$50,000 to $74,999	310	13.6%	136,141	20.4%	470	21.9%	146,852	20.9%
$75,000 to $99,999	86	3.8%	58,361	8.7%	126	5.9%	87,734	12.5%
$100,000 to $149,999	72	3.2%	36,565	5.5%	97	4.5%	69,882	9.9%
$150,000 to $199,999	20	0.9%	8,551	1.3%	43	2.0%	17,498	2.5%
$200,000 or more	16	0.7%	8,873	1.3%	39	1.8%	15,477	2.2%
Total	2,285	100.0%	666,995	100.0%	2,149	100.0%	702,637	100.0%
Median Household Income	$30,498		$39,250		$37,938		$47,995	
Number of Households	2,285		666,995		3,145		702,637	

Source: U.S. Census Bureau, 2000, ACS 2006-2010

Income Source and Public Assistance

The table below shows personal income by source for Furnas 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 1970 and 2010, the CPI was equal to 426.0%.

Table 5.2: Income by Source
Furnas County and the State of Nebraska 1970 to 2010

Income Characteristics	1980	1990	2000	2010	% Change 1980-2010
Furnas County					
Total Personal Income	$47,808,000	$102,101,000	$127,051,000	$188,651,000	294.6%
Non-farm Income	$54,490,000	$79,579,000	$117,045,000	$154,760,000	184.0%
Farm Income	-$6,682,000	$22,522,000	$10,006,000	$33,891,000	607.2%
Per Capita Income	$7,362,000	$18,094,000	$23,976,000	$38,088,000	417.4%
State of Nebraska					
Total Personal Income	$14,394,940,000	$28,388,321,000	$48,997,941,000	$72,189,707,000	401.5%
Non-farm Income	$14,296,494,000	$26,201,453,000	$47,577,270,000	$68,743,169,000	380.8%
Farm Income	$98,446,000	$2,186,868,000	$1,420,671,000	$3,446,538,000	3400.9%
Per capita income	$9,155	$17,948	$28,590	$39,445	330.9%

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

Non-farm and Farm Income

Total non-farm income, in Furnas County, increased from $10,505,000 in 1970 to $126,490,000 in 2010, or an increase of 1104.1%, which was more than 2.5 times the CPI. By 2010, farm income had risen from $4,905,000 to $44,973,000, or 816.9%, which is nearly 2 times the CPI.

Per Capita Income

The per capita income in Furnas County increased from $3,742 in 1970 to $43,110 in 2010, or an increase of 1052.1%, which was over twice the CPI. Furnas County's per capita income has grown at a greater rate than the state.

Transfer Payments

Another income source deserving examination is the amount of Transfer Payments to individuals in Furnas County from 1970 to 2010, which is provided in Table 5.3. 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. In 1970, Total Transfer Payments to Furnas County were $3,593,000, and the State was $497,556,000. By 2010, Total Transfer Payments to Furnas County were $44,729,000, or an increase of 1145.0%, and the State total was $11,549,651,000, or an increase of 576.4%.

Table 5.3: Transfer Payments
Furnas County/State of Nebraska 1970 to 2010

Payment Type	1970	1980	1990	2000	2010	% Change 1970 to 2010	% Change Per Year
Furnas County							
Government payments to individuals	$ 2,976,000	$ 10,064,000	$17,368,000	$26,826,000	$43,704,000	1368.5%	34.2%
Retirement, Disability & Insurance Benefits	$ 2,161,000	$ 6,445,000	$10,733,000	$13,179,000	$17,425,000	706.3%	17.7%
Medical Benefits	$ 767,000	$ 2,504,000	$5,248,000	$11,295,000	$20,438,000	2564.7%	64.1%
Income Maintenance Benefits (SSI, AFDC, Food Stamps, etc)	$ 150,000	$ 462,000	$679,000	$1,403,000	$3,021,000	1914.0%	47.9%
Unemployment Insurance Benefits	$ 55,000	$ 133,000	$95,000	$162,000	$706,000	1183.6%	29.6%
Veteran's Benefits	$ 246,000	$ 429,000	$459,000	$562,000	$1,607,000	553.3%	13.8%
Federal Education and Training Assistance	$ 57,000	$ 91,000	$152,000	$216,000	$392,000	587.7%	14.7%
Payment to Non-profit Institutions	$ 84,000	$ 239,000	$262,000	$436,000	$604,000	619.0%	15.5%
Business Payments	$ 73,000	$ 181,000	$390,000	$599,000	$421,000	476.7%	11.9%
Total	$ 3,593,000	$ 10,484,000	$18,020,000	$27,861,000	$44,729,000	1145%	28.6%
Transfer Payments Per Capita	$ 520.95	$ 1,616.40	$3,245.09	$5,233.10	$9,019.76	178.0%	4.4%
Total Per Capita Income	$ 3,382	$ 7,362	$18,463	$23,976	$38,312	107.5%	2.7%
Per Capita Transfer Payments as % of Per Capita Income	15.4%	22.0%	17.6%	21.8%	23.5%	52.8%	1.3%
State of Nebraska							
Total	$ 497,556,000	$1,693,802,000	$3,365,241,000	$6,088,115,000	$11,549,651,000	576.4%	14.4%
Transfer Payments Per Capita	$ 334.39	$ 1,077.28	$2,127.66	$3,552.37	$6,311.84	536.3%	13%
Total Per Capita Income	$ 3,905	$ 9,386	$18,459	$28,967	$39,473	372.7%	9%
Per Capita Transfer Payments as % of Per Capita Income	8.6%	11.5%	11.5%	12.3%	16.0%	86.7%	2.2%

Source: Bureau of Economic Analysis, Regional Economic Information System, 2010

Total transfer payments between 1970 and 2010 have shown an increase in each reporting periods. Retirement, Disability, & Insurance Benefits as well as medical payments comprised the majority of total transfer payments. The largest percentage increase occurred within Medical Payments, which increased by nearly 2600% or 64.1% annually. Income Maintenance was second at over 1900.00% or 47.9% annually.

In 1970, transfer payments per capita in Furnas County was $520.95, and the State was $334.39. Assuming every person in the county received some sort of Federal aid, each person in Furnas County would have gotten $520.95. By 2010, the per capita transfer payment in Furnas County increased to $9,019.76 or an increase of 178.0%. The trend for transfer payments per capita between 1970 and 2010 indicates significant increases.

The per capita Transfer Payments can be compared to the total per capita income of Furnas County. When comparing the two, in 1970, Transfer Payments made up 15.4% of the total per capita income in Furnas County. In 2010, Transfer Payments per capita comprised 23.5% of the total per capita income of the county.

The significance of these numbers is make the county aware of the impact federal programs, outside of the Farm Program, are having within Furnas County. Discussion will likely continue in Washington D.C. regarding the cutting or elimination of these federal programs; as it does continue counties and communities need to realize the impacts and need to be prepared for any negative effects that result.

Industry Employment

Employment by industry shows what types of jobs the residents of Furnas County are engaged. The data in Table 5.4 do not represent, completely the types and numbers of jobs within Furnas County. Table 5.4 indicates employment size by industry for Furnas County and the State of Nebraska for 2000 and 2010.

Table 5.4: Employment by Industry Furnas County 2000 to 2010

Industry Categories	Furnas County			
	2000	% of Total	2010	% of Total
Agriculture, Forestry, Fishing and Hunting and Mining	393	16.1%	349	14.7%
Construction	173	7.1%	169	7.1%
Manufacturing	190	7.8%	151	6.4%
Wholesale Trade	114	4.7%	79	3.3%
Retail Trade	251	10.3%	257	10.8%
Transportation and warehousing and utilities	183	7.5%	111	4.7%
Information	72	2.9%	91	3.8%
Finance, insurance, real estate, and rental and leasing	131	5.4%	136	5.7%
Professional, scientific, management, administrative, and waste management	75	3.1%	90	3.8%
Educational, health, and social services	554	22.6%	580	24.4%
Arts, entertainment, recreation, accommodation and food services	102	4.2%	163	6.9%
Other services (except public administration)	126	5.1%	125	5.3%
Public Administration	83	3.4%	75	3.2%
Total Employed Persons	2,447	100.0%	2,376	100.0%

Source: U.S. Census Bureau 2000 and ACS 2005-2010

Table 5.4 shows the employment sector with the greatest number of employees was Educational, health and social services, as well as Agriculture, Forestry, Fishing and Hunting, and Mining. Each sector employed 409 people or 20.8% of the total employed residents in 2000.

By 2010, Agriculture, Forestry, Fishing and Hunting, and Mining had increased to 423 employees or 20.5% of the total workforce. However, Educational, health and social services declined to 322 employees or 15.6% and fell into third place.

Overall the top five industries in Furnas County in 2000 were:

1. Educational, health, and social services (tie)
2. Agriculture, forestry, fishing and hunting and mining (tie)
3. Retail Trade
4. Other services (except public administration)
5. Manufacturing (tie)
6. Construction (tie)

Overall the top five industries in Furnas County in 2010 were:

1. Agriculture, forestry, fishing and hunting and mining
2. Retail Trade
3. Educational, health, and social services
4. Transportation and warehousing and utilities
5. Arts, entertainment, recreation, accommodation and food services

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 Furnas County is seeing exports from the state as a whole.

TABLE 5.5: BASIC/NON-BASIC EMPLOYMENT
FURNAS COUNTY 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
Furnas County	31.0%	22.5%	20.7%	13.5%	12.3%	18.2
Harlan County	39.6%	14.6%	18.9%	18.3%	8.6%	8.7
Phelps County	32.0%	16.5%	24.2%	12.0%	15.2%	10.6
Gosper County	29.5%	14.4%	26.9%	16.1%	13.2%	23.4
Frontier County	34.9%	15.3%	21.1%	16.4%	12.4%	8.0
Red Willow County	26.0%	18.3%	27.8%	10.8%	17.1%	12.3
Nebraska	34.8%	16.2%	25.0%	10.1%	13.8%	NA

Source: American Community Survey 2006-2010

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:

- Management business, science, and arts occupations
- Service occupations
- Sales and office occupations
- Natural resources, construction and maintenance occupations
- Production, transportation, and materials moving occupations

A related concept to the basic/non-basic distinction is the 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 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 if basic jobs bring new money into a local economy, the money then becomes the wages for workers in the 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 Furnas County's percentage exceeds the state's percentage there is Basic employment. Table 5.5 indicates there are two categories where Basic employment is present: Sales and office occupations and Natural Resources, construction and maintenance occupations.

Overall, 44.5% of the employment base in Furnas County is tied to the exportation of goods or services in these two categories. The county needs to continually work on their Business Retention and Expansion process in order to make these employers stay in the county.

Base Multiplier

The information in Table 5.5 shows Furnas County has a base multiplier of 9.64, which means every job falling into the basic category, 9.64 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 9.64 jobs created/ supported by the dollars coming into the county. Therefore, if Furnas County lost just one of the jobs tied to exports then there is the potential to lose approximately 9.64 jobs from the non-basic employment side. There is no magical multiplier a county should 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.

There is one concern showing up in Table 5.5, the large amount of basic employment found in the Natural Resources, construction and maintenance occupations. This area has 63.0% of all the Basic

employment in Furnas County. Major decisions could have major economic impacts on the county. Future economic development efforts need to focus on improving the basic activity found in the other four categories.

It is critical for a county to determine their future vision for business and industry and work towards that end goal. 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

Table 5.7 show the commuter characteristics for Furnas County in 2000 and 2010. Travel time to work is another factor used to gauge where Furnas County's workforce is employed. Table 5.7 shows how many residents of Furnas County travel to work in each of several time categories.

Table 5.7 indicates there was an overall increase in the number of people from Furnas County working in 2010 compared to 2000. The number of people working increased from 1,939 in 2000 to 1,972 in 2010 or a change of 1.7%. The 1.7% change in persons working compared to an overall population change of –2.5% would suggest the overall population change saw a large number of working age/ employed individuals.

Table 5.7 indicates the workforce in 2010 spent less time traveling to work than in 2000. The average travel time decreased from 12.9 minutes in 2000 to 10.9 minutes in 2010. The largest change occurred with those traveling 30 to 44 minutes, which decreased by 74 people or –60.2%. The second greatest group was the 20 to 29 minutes category, which increased by 62 persons, or 32.6%. One item of note contributing to less time driving is those working from home increased by 39 people or 27.9%.

Table 5.7: Travel Time to Work
Furnas County 1990 to 2010

Travel Time Categories	2000	% of Total	2010	% of Total	% Change
Less than 10 minutes	1,081	45.4%	1,057	59.3%	-2.2%
10 to 14 minutes	316	13.3%	272	14.1%	-13.9%
15 to 19 minutes	214	9.0%	142	2.4%	-33.6%
20 to 29 minutes	200	8.4%	267	3.0%	33.5%
30 to 44 minutes	251	10.5%	308	12.0%	22.7%
45 to 59 minutes	101	4.2%	56	3.4%	-44.6%
60 minutes or more	79	3.3%	100	5.8%	26.6%
Worked at home	139	5.8%	143	6.1%	2.9%
Total	2,381	100.0%	2,345	100.0%	-1.5%
Mean Travel Time (minutes	20.7		21.7		4.8%

Source: U.S. Census Bureau 2000 and ACS 2005-2010

Agricultural Profile

The agricultural profile evaluates key elements of the agriculture industry. Since most Nebraska counties were formed around county seats and agriculture, the agricultural economy, historically, has been the center of economic activity for counties. The U.S. Census Bureau, through the Census of Agriculture tracks agricultural statistics every five years. Since the frequency and years do not coincide with the decennial U.S. Census, it is difficult to compare sets of data.

Agriculture Trends

Table 5.8 identifies key components affecting Furnas 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 1992 through 2007.

Number of Farms

Table 5.8 shows the number of farms in Furnas County decreased between 1992 and 2007. This has been a normal trend throughout the entire state; fewer but larger farms. In 1992 there were 368 farms in the county; by 2007 the number decreased to 347 or a change of –5.7%. The state of Nebraska, for the same period, saw a decrease of over 5,200 farms for a total change of -9.8%. Therefore, the number of farms in Furnas County are decreasing at a slower rate than the state as a whole.

Average Size

The average size of each farm increased from 1,417 acres in 1992 to 1,602 acres in 2007. The overall increase from 1992 to 2007 was 13.1%. Furnas County's farms are considerably larger on average than the state of Nebraska. The average farm in Nebraska was 839 acres in 1992 and increased to 953 acres in 2007, an increase of 13.6%. Based upon these

data and the smaller number of farms, Furnas County has seen a major consolidation prior to 1992 than a lot of counties in Nebraska.

TABLE 5.8: AGRICULTURAL PROFILE FURNAS COUNTY 1997 TO 2012

Agricultural Characteristics	1997	2002	2007	2012	% Change 1997-2012
Number of Farms	553	513	365	389	-29.7%
Land in Farms (acres)	273,892	283,026	445,844	435,711	59.1%
Average size of farms (acres)	495	552	1,221	1,120	126.3%
Total area for Furnas County	574,464	574,464	574,464	574,464	0.0%
Percentage of land in farms	47.7%	49.3%	77.6%	75.8%	59.1%
Total cropland (acres)	220,316	216,711	199,641	200,159	-9.1%
Harvested cropland (acres)	198,457	200,573	187,894	193,720	-2.4%
Estimated Market Value of Land & Bldg (avg./farm)	$657,609	$684,366	$959,888	$1,833,841	178.9%
Estimated Market Value of Land & Bldg (avg./acre)	$363	$1,339	$1,821	$3,838	957.3%

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

Total Cropland

The total cropland in Furnas County has been decreasing between 1992 until 2007; during this period the amount went from 319,652 acres to 309,580 acres. In 1992, 90.8% of the land within Furnas County was considered to be in farms and by 2007 the amount of the county considered to be in farms increased to 96.8%.

Harvested Cropland

The next term/data to review is harvested cropland. Harvested cropland is as it sounds cropland actually harvested. In 1992 the Harvested Cropland in Furnas County was 205,219 (64.2% of Total Cropland and only 39.4% of the Total Land in Farms). By 2007, the Harvested Cropland increased to 245,601 acres (79.3% of Total Cropland and 44.2% of the Total Land in Farms). These data would indicate a lot of the land in farms is used for the grazing of livestock throughout the county.

Estimated Market Value

Table 5.8 also shows the Estimated Market Values of Land and Buildings, both by average per farm and average per acre. In 1992 the average value per farm acre was $515. The average value increased in every Census of Agriculture, except 2002, until it reached an average per acre of $1,003 in 2007; an increase of 94.8% from 1992. The CPI for this same period was approximately 50%; therefore the average value per acre increased at nearly 2 times the rate of inflation in Furnas County.

The increase in the average per acre also translates into an increase in the average per farm. The average value per farm in 1992 was $752,305 and increased to $1,607,310 in 2007, an overall increase of 113.7%. Again, this increase exceeded the CPI and the rate of inflation for the period.

The average per farm, statewide, was $429,188 in 1992 and $1,104,392 in 2007, an increase of 157.3%. Therefore, the average farm value in Furnas County is higher than the state average.

TABLE 5.9: NUMBER OF FARMS BY SIZE FURNAS COUNTY 1997 TO 2012

Farm Size (acres)	1997	2002	2007	2012	% Change 1997-2012
1 to 9	20	28	25	38	90.0%
10 to 49	55	55	78	99	80.0%
50 to 179	131	106	105	100	-23.7%
180 to 499	140	121	94	89	-36.4%
500 to 999	122	121	89	81	-33.6%
1,000 or more	85	82	82	85	0.0%
Total	**553**	**513**	**473**	**492**	**-11.0%**

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

Table 5.9 shows the number of farms by size (in acres) in 1992, 1997, 2002, and 2007. The table between

1992 and 2007 there was a mixed change with regard to farm size. Farms 1 to 9 acres in size saw a –62.5% change while those 10 to 49 acres saw an increase of 192.3%. Furthermore, the number of farms between 50 acres and 179 increased by 44.4%. Finally the farms of 180 acres and more saw a decrease in the total number; these farm sizes decreased by 19.0%.

TABLE 5.10: FARMS AND LIVESTOCK BY TYPE FURNAS COUNTY 1997 TO 2012

Type of Livestock	1997	2002	2007	2012	% Change 1997 to 2012
Cattle and Calves					
farms	301	278	227	227	-24.6%
animals	79,641	60,102	59,187	44,952	-43.6%
average per farm	265	216	261	198	-25.2%
Beef Cows					
farms	259	247	206	204	-21.2%
animals	13,582	14,050	(D)	12,026	-11.5%
average per farm	52	57	(D)	59	12.4%
Milk cows					
farms	9	5	2	3	-66.7%
animals	186	434	(D)	153	-17.7%
average per farm	21	87	(D)	51	146.8%
Hogs and Pigs					
farms	51	15	13	8	-84.3%
animals	31,122	21,387	46,669	29,592	-4.9%
average per farm	610	1,426	3,590	3,699	506.2%
Sheep and lambs					
farms	14	10	12	11	-21.4%
animals	535	482	329	219	-59.1%
average per farm	38	48	27	20	-47.9%
Chickens (layers and pullets)					
farms	14	18	22	36	157.1%
animals	(D)	339	471	563	-
average per farm	(D)	19	21	16	-

Source: U.S. Census of Agriculture, 1997, 2002, 2007, 2012
(D) indicates disclosure problems

Table 5.10 indicates the number of farms and livestock by type for Furnas County between 1992 and 2007. The predominant livestock raised in Furnas County are Cattle and Calves, and Beef Cows followed by Hogs and Pigs. Livestock production in Furnas County has been varied between 1992 and 2007. Only one categories can truly be identified as having an increase in production; Cattle and Calves.

Cattle and calf production increased by 13.0% for the total number of animals raised. However, there was a decline in the number of farms producing Cattle and calves; going from 182 in 1992 to 120 in 2007 or a change of –34.1%. The average per farm increased by over 70% for the same period.

The only other livestock type that there is full data on is Sheep and Lambs. Sheep and Lambs in Furnas County saw a decrease in the total farms raising the animals from 12 to nine farms or a change of –25.0%. The total number of animals raised has also deceased significantly going from 988 animals in 1992 to 128 animals in 2007 (-87.0%). Both of these combined contributed to the fact that the average per farm also decreased.

The rest of the livestock types are difficult to completely analyze since there are disclosure issues on each of them at one point or another during the review period. The only thing that is apparent is the number of farms in each has decreased substantially and in the case of Milk Cows has completely been eliminated in Furnas County.

TABLE 5.10: FARMS AND CROPS BY TYPE FURNAS COUNTY 1997 TO 2012

Type of Crop	1997	2002	2007	2012	% Change 1997 to 2012
Corn for Grain					
farms	425	327	290	280	-34.1%
acres	153,615	121,539	130,785	121,521	-20.9%
average per farm	361	372	451	434	20.1%
Corn for Silage					
farms	33	45	19	25	-24.2%
acres	1,098	2,630	1,297	1,844	67.9%
average per farm	33	58	68	74	121.7%
Sorghum					
farms	7	6	2	1	-85.7%
acres	486	302	(D)	(D)	-
average per farm	69	50	(D)	(D)	-
Wheat					
farms	37	10	32	18	-51.4%
acres	642	284	3,506	1,176	83.2%
average per farm	17	28	110	65	276.5%
Oats					
farms	14	5	2	-	-
acres	225	86	(D)	-	-
average per farm	16	17	(D)	-	-
Soybeans					
farms	251	258	167	211	-15.9%
acres	26,915	59,559	39,007	57,448	113.4%
average per farm	107	231	234	272	153.9%
Dry Edible Beans excluding Limas					
farms	-	-	-	-	-
acres	-	-	-	-	-
average per farm	-	-	-	-	-
Potatoes					
farms	-	2	1	4	-
acres	-	(D)	(D)	(D)	-
average per farm	-	(D)	(D)	(D)	-

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

Table 5.11 shows the number of farms and crop by type for the period from 1992 to 2007. 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 wheat have been the two most frequently raised crops in Furnas County since 1992. One of the eight categories showed an increase in acres farmed; this would be Corn for Grain. Corn for grain saw a decrease in the total number of farms during the period but saw the total acres increase from 122,613 acres to 171,942 acres or 40.2%. This contributed to the fact the average per farm increasing from 538 acres to 994 acres or 84.8%.

Wheat during this period has been a dominate crop but has seen a decrease in the acres planted from 1992 to 2007; going from 46,586 acres to 44,211 acres or –3.8%. However, the wheat production did see an increase in the 1997 Census of Agriculture going to 58,386 acres. The number of farms planting wheat has also decreased by 70 farms or –32.7%.

In the 2002 and 2007 Census of Agriculture several additional crop types were added. The two which appeared to have some popularity in Furnas County were Dry Edible Beans (excluding Limas) and Potatoes. In the short period that these have been tracked the Dry Edible Beans appears to have lost popularity between 2002 and 2007 showing decreases in the number of farms and acres planted. However, during the same period potatoes appear to be gaining in popularity as a crop; going from 2,136 acres planted on 2002 to 2,663 acres planted in 2007.

Agriculture has always been a major part of the Furnas County economy. It appears 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 Goals and Policies

Economic Development Goal 5.1

Promote a balanced economic development effort that strives to add value to the agricultural base of the county.

Economic Development Policies and Strategies

ED-5.1.1 Agriculture and agricultural employment, including value-added agricultural businesses, should be promoted throughout Furnas County.

ED-5.1.2 Furnas County should encourage economic development projects, which do not conflict with the agricultural character of the County.

ED-5.1.3 Work with businesses and agricultural operators to build new vertically integrated economic systems from the current agricultural uses in place.

ED-5.1.4 Work to establish new or existing public and/or private research facilities in Furnas County.

Economic Development Goal 5.2

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

Economic Development Policies and Strategies

ED-5.2.1 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-5.2.2 The youth of Furnas County should be involved in the identification and development of these projects.

ED-5.2.3 The county should also attract the youth back to the county that are commuting to Lexington, McCook, Holdrege and Kearney.

Economic Development Goal 5.3

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

Economic Development Policies and Strategies

ED-5.3.1 Develop a promotional campaign to promote the quality of life issues of Furnas County as a place to live and "Work from".

ED-5.3.2 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-5.3.3 Identify businesses and professions where telecommuting would be appropriate and functional.

6

Furnas County Facilities

County Facilities

State and local governments provide a number of services to their citizens. The people, buildings, equipment and land utilized in the process of providing these goods and services are referred to as public facilities.

Public facilities represent a wide range of buildings and services that are built and maintained by the different levels of government. Such facilities are provided to insure the safety, wellbeing and enjoyment of the residents of Furnas 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 Plan. 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.

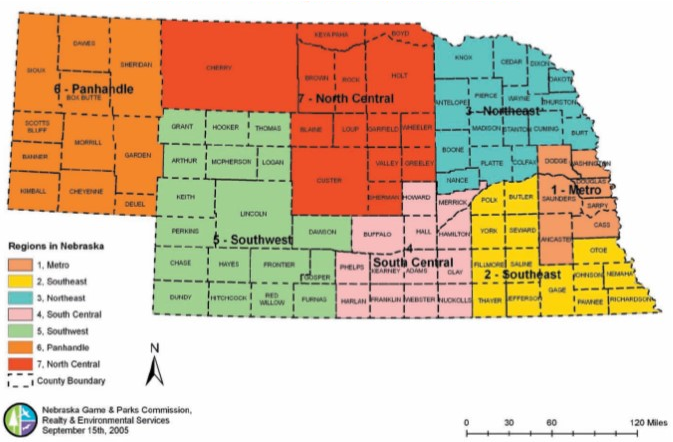
The Facilities Plan for Furnas County is divided into the following categories:

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

Recreation

Furnas County is located in Nebraska's southwest Recreation Planning, Region 5, and a region within the Nebraska Department of Game and Parks system. The Region includes 18 counties in southwest Nebraska.

Figure 6.1: Nebraska Game and Parks Regions
Community Parks and Facilities



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

Arapahoe Parks and Recreation

Arapahoe City Park

The Arapahoe City Park is located between 8th Street and the alleyway between 7th Street and Nebraska Avenue; and between Locust Street and Elm Street. The park contains a swimming pool, splash pad, picnic shelters and playground equipment.

Photograph 6.1
Aerial view of Arapahoe City Park
Source: Google Earth

Arapahoe Tennis Courts

The Arapahoe Tennis Courts are located at 4th Street and Cedar Street. The facility has two tennis courts.
Source: http://www.arapahoe-ne.com/businesses/arapahoetenniscourts.htm

Furnas County Facilities

Beaver City Parks and Recreation

There are four park areas in Beaver City. The different facilities are located in different parts of the community.

Westside Park

Westside Park is located in the downtown square in the heart of the downtown. The park is more of passive facility with a gazebo and trees on the site.

Swimming Pool Park

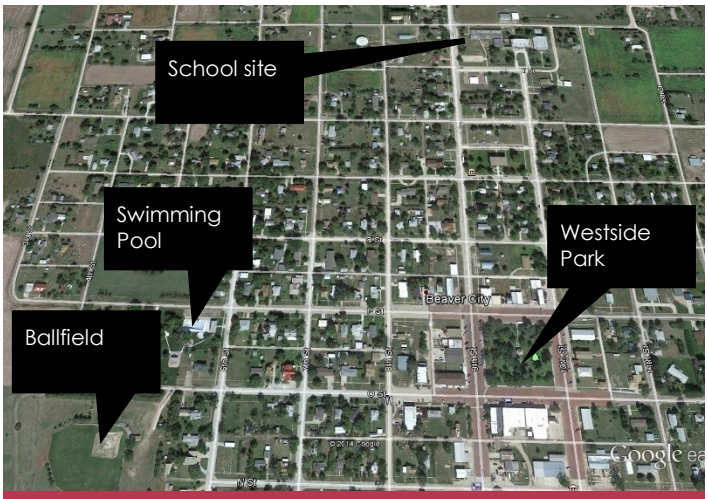
The Swimming Pool Park is located in the west side of the community, it is due west of Westside Park on "O" and "P" Streets. The Park contains the swimming pool, playground equipment, a picnic shelter and a old military tank.

Ball Field

Beaver City on the southwest corner of the community is a ballfield. The facility contains bleachers and a concession stand.

School Playground

On the north central part of Beaver City is the local attendance center. The facility contains basketball standards and playground equipment.



Photograph 6.2
Aerial view of Beaver City Parks
Source: Google Earth

Cambridge Parks and Recreation

Cambridge has one park, McKinley Park, located on the east edge of the community. The park area is near Cross Creek Golf Links. According to the Cambridge Comprehensive Plan, the amenities of the park are:

- Cambridge Municipal Pool
- Picnic shelters
- Tables
- Benches
- Playground equipment
- Disc golf course
- Fenced in with a new surface basketball and tennis courts
- Two ball fields
- Restrooms
- Hike/bike trail
- 11 space RV camping facility
- Formal flower garden
- Splash pad

Holbrook Parks and Recreation

Holbrook has one smaller park located on the north side of US highway 6. It has some playground equipment and a picnic shelter at the location.

Photograph 6.3
View of Cambridge Swimming Pool
Source: Cambridge Comprehensive Plan

Photograph 6.4
View of Holbrook City Park
Source: Google Earth

Oxford Parks and Recreation

Oxford has two parks located on the south and north ends of the community.

North Park

The park located on the north edge of the community contains:

- the Oxford swimming pool
- some playground equipment
- Picnic shelter
- Picnic tables

South Park

The park located on the south edge of the community contains:

- a ball field
- some playground equipment
- Picnic shelter
- Picnic tables

Property on the school grounds also contains tennis courts and playground equipment.

Regional Recreation

Cambridge Diversion Dam Wildlife Management Area

Cambridge Diversion Dam WMA is located two miles east of Cambridge and contains 20 acres. Hunting is allowed for deer, dove, rabbit, turkey, and squirrel. **(Source: http://outdoornebraska.ne.gov)**

Oxford Wildlife Management Area

Oxford WMA is located five miles west of Oxford and contains 23 acres. Hunting is allowed for deer, quail, rabbit, squirrel, turkey, and water fowl. **(Source: http://outdoornebraska.ne.gov)**

Golf Courses

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

Arapahoe Municipal Golf Course - Arapahoe

Located three miles south of Arapahoe on Highway 283, the Arapahoe Municipal Golf Course and Country Club offers a nine-hole (2,200 yards) course of competitive play. The multi-room Country Club is available for rental on a "seasonal availability" basis that includes a kitchen, dining room, bar area and large room that can be used for dining/dancing. **(Source: http://www.arapahoe-ne.com/businesses/golfcourseandcountryclub.htm)**

Cross Creek Golf Links - Cambridge

Cross Creek Golf Links is located along the northeast side of Cambridge. As the longest public golf course in the State of Nebraska, measuring 7,205 yards from the tips, Cross Creek Golf Links offers a variety of teeing areas, wide fairways, and large greens allowing each golfer to enjoy the experience regardless of age or ability. This 18-hole golf links course is home to men's, women's, seniors', and couples' leagues; reciprocity and social memberships are also available. The Clubhouse is open seven days a week from 8:00 A.M. until dusk.

Photograph 6.5
Cross Creek Golf Links
Source: Cambridge Comprehensive Plan

(Source: Cambridge Comprehensive Plan)

Cardinal Country Club– Oxford

Cardinal country club is a 9-hole regulation golf course located on the north edge of the community.

Other golf courses serving the Furnas County area include:

Course	Community
Alma Golf Course	Alma
Heritage Hills Golf Course	McCook
Broken Tee Par 3 Golf Course	McCook
Lakeside Country Club	Elwood
Hi-Line Golf Course	Bertrand
Holdrege Country Club	Holdrege
Arrowhead Meadows Golf & Recreation	Curtis
Prairie Dog Course	Norton, KS

Museums

Furnas Gosper Museum

The Furnas/Gosper County Museum was established in 1968. The Furnas/Gosper County Historical Society took control of the museum in 1998. Their mission is to preserve the history and artifacts of Furnas and Gosper Counties. **Source: http://www.arapahoe-ne.com/attractions/furnasgospermuseum.htm)**

Historical Sites

Cambridge State Aid Bridge

Established by the Nebraska State Legislature in 1911, the state aid bridge program was designed to assist the counties in construction of major river crossings. In February 1913 Furnas County first applied for state aid to build a bridge across the Republican River south of Cambridge. The bridge was constructed in 1914. Over its twenty-five-year duration, the state aid bridge program was responsible for some seventy-seven structures, seventeen of which were concrete arch spans. The Cambridge Bridge is distinguished among these as one of the two oldest remaining. **(Source: http://www.nebraskahistory.org/histpres/nebraska/Furnas.htm**

W.H. Faling House

Constructed in 1909, the Failing House is located in Cambridge. It is representative of the eclectic Neo-Classical style popular during the early part of the twentieth century. The house is architecturally significant and contributes to a time when the West was becoming more cultured, and manifesting its growth through a more elaborate physical building stock. The two-story house retains a high degree of historical integrity.
(Source: http://www.nebraskahistory.org/histpres/nebraska/Furnas.htm

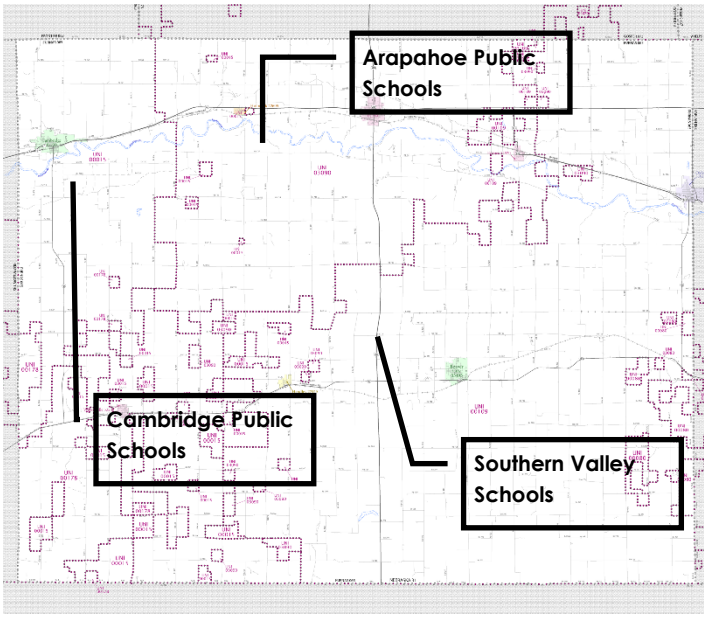
Education

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	*Recently 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.

Figure 6.2: School District Map
Furnas County Public School District



Source: US Census 2010

Arapahoe Public Schools

Education in north central Furnas County is provided to the public by the Arapahoe Public Schools. APS is accredited by the State of Nebraska. The district has two facilities:

- Arapahoe Elementary

- Arapahoe Middle/High School

Cambridge Public Schools

Education in western Furnas County is provided to the public by the Cambridge Public Schools. CPS is accredited by the State of Nebraska. The district has two facilities:

- Cambridge Elementary
- Cambridge Middle/High School

Southern Valley Schools

Education in the majority of the county is provided to the public by the Southern Valley Schools. SVS is accredited by the State of Nebraska. Southern Valley was the result of a consolidation in 1993 between Beaver City, Edison, Hendley, Hollinger, Orlean, Oxford, and Stamford. The district has two facilities:

- Southern Valley Elementary
- Southern Valley Junior/Senior High School

Post-Secondary Education

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

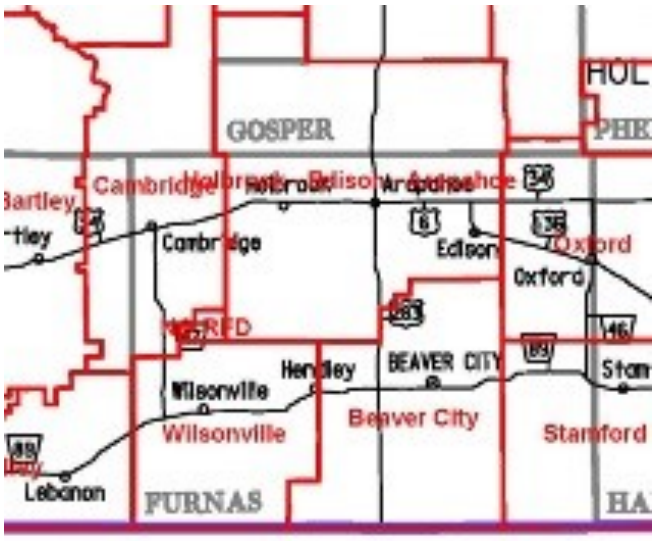
The residents of Furnas County and the surrounding area have a large selection of in-state and out-of-state post-secondary schools to select. Some of these include:

Mid-Plains Community College	McCook and North Platte
Bellevue University	North Platte
University of Nebraska	Lincoln
Nebraska Wesleyan	Lincoln
University of Nebraska	Omaha
Creighton University	Omaha
University of Nebraska	Kearney
Ne. College of Technical Ag.	Curtis
Chadron State College	Chadron
NW Kansas Technical College	Goodland, KS
Colby Community College	Colby, KS

Fire and Police Protection

Fire and rescue in Merrick County is handled through multiple volunteer departments. These departments are located in Arapahoe, Beaver City, Cambridge, Oxford, Stamford, and Wilsonville.

Figure 6.3: Fire District Map
Furnas County 2015



Source: Nebraska Department of Roads

Law Enforcement

Furnas County Sheriff's Department

Law enforcement in Furnas County is the responsibility of the Furnas County Sheriff. The office of the Furnas County Sheriff is located at 912 "R" Street in Beaver City. In addition to the Sheriff's office, the facility also contains the county jail.

Table 6.1: Sworn Officer Comparison
Furnas County 2013
Source: Nebraska Commission on Law Enforcement and Criminal Justice 2013, 2012, 2011

County	2011		2012		2013	
	Sworn Officers FT/PT	Officers per 1,000 Population	Sworn Officers FT/PT	Officers per 1,000 Population	Sworn Officers FT/PT	Officers per 1,000 Population
Furnas	**8/0**	**1.6**	**7/0**	**1.4**	**7/0**	**1.4**
Gosper	4/2	1.9	4/0	2.0	4/0	2
Red Willow	6/2	1.8	6/2	1.8	7/1	2.1
Frontier	5/0	1.8	5/0	1.8	4/0	1.5
Harlan	4/0	1.2	4/0	1.2	4/0	1.2
Phelps	6/0	1.6	5/0	1.3	6/2	1.6

Based upon data from the Nebraska Commission on Law Enforcement and Criminal Justice, Furnas County had seven full-time sworn officers in two of

the three years in Table 6.1. When examining the number of sworn officers per 1,000 people, the Furnas County Sheriff's office had an average of 1.4 sworn officers per 1,000 people in the county during two of the three years.

Table 6.1 also shows the number of sworn officers and officers per 1,000 persons in the surrounding counties. Red Willow County to the south had the largest number of sworn officers at 2.1 sworn officers per 1,000 people.

The ratio of law enforcement officers per 1,000 persons in the population allows for an ability to compare law enforcement levels across counties. The data indicate Furnas County has been maintaining a ratio between 1.4 and 1.6 sworn officers per 1,000 people over a period of time; apparently this is a good balance for Furnas County.

County Buildings

County Courthouse

The first courthouse stood for 60 years before being declared unsafe for occupancy in 1948. The courthouse was dismantled the following year and after the county offices were housed in various downtown buildings for two years, the current courthouse was dedicated on May 4, 1951

The courthouse houses the County Board of Commissioners, the County Clerk, County Assessor, Treasurer, Election Commissioner, Register of Deeds, District Court, County Court, UNL Extension, Sheriff, Emergency Management, and Planning and Zoning.
(Source: http://furnascounty.ne.gov)

Communication

Telephone Services

There are numerous telephone providers serving Furnas County, including two locally owned and operated companies. The locally owned companies are ATC Communications in Arapahoe and Pinpoint Communications (Cambridge Telephone Company) located in Cambridge.

Radio Stations

There are several radio stations serving the Furnas County area. The nearest stations are based and broadcast from McCook, North Platte, Hastings, Holdrege, and Lexington .

Television Stations

Presently there is no local television stations located in Furnas County. The over the air stations that serve the area originate out of Lincoln, Hastings, and North Platte in Nebraska.

Internet/World Wide Web Service Providers (ISP)

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

Newspapers

The residents of Furnas County are served by several area newspapers including:

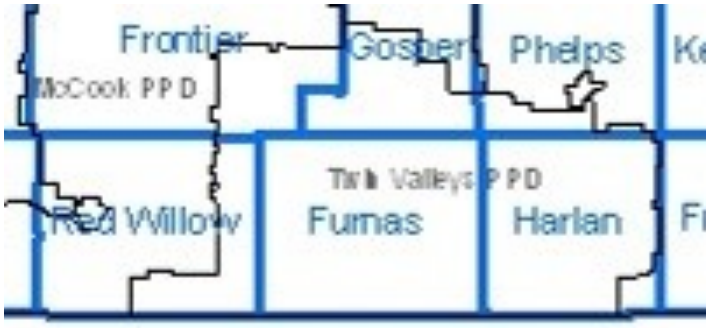
- Phelps News
- McCook Daily Gazette
- Omaha World-Herald

Public Utilities

Electricity

There one public power provider serving Furnas County. Twin Valleys Public Power Districts serves all of Furnas County and portions of Harlan County, Gosper County, Frontier County, Phelps County, and Red Willow County.

Figure 6.4: Service Area Map - Public Power Furnas County 2015



Natural Gas

Natural gas is supplied to parts of Furnas County by SourceGas and PACE.

Solid Waste

Sanitation collection in Furnas County is provided by private haulers.

Health Care

Tri Valley Health System

What is now known as Tri Valley Health System began over 50 years ago with the opening of Cambridge Memorial Hospital in 1958. With the assistance from a Hill-Burton grant, a fund drive by area residents, and

a bequest from John Decker, the dream of creating a hospital to service Furnas County and the surrounding area was realized.

Among Tri Valley's many offerings are:

- **Cambridge Memorial Hospital:** A licensed, 25-bed critical access hospital.
- **Satellite Medical Clinics:** Personal medical service in Arapahoe, Cambridge and Indianola.
- **Tri Valley Wellness and Rehab Center:** An indoor fitness facility with equipment and programs for all fitness levels.
- **Tri Valley Nutrition and Diabetic Services:** Education, support groups, and plans to aid in weight management, overall nutrition, and diabetic prevention or management.
- **Tranquil Valley Spa Services:** Soothing and invigorating natural therapy.
- **Tri Valley Diagnostic Sleep Center:** No need to leave town to diagnose sleep apnea and other problems.
- **Tri Valley Home Medical Supplies:** Essential supplies conveniently available at the Cambridge Medical Clinic.
- **Cambridge Manor:** A licensed, 36-bed long-term care facility.
- **Heritage Plaza:** A pleasant, spacious center for retirement living.
- **Assisted Living Facility:** A caring center with a personal touch.
- **Cambridge Memorial Hospital Auxiliary:** Friends in need, friends indeed during times of hospitalization.
- **Cambridge Care Call:** A two-way personal response link to life-saving medical services.

Source: (http://www.trivalleyhealth.com/AboutUs.aspx)

Furnas County is served regionally by the following hospitals:

- Community Hospital - McCook
- Phelps Memorial Hospital - Holdrege
- Harlan County Health Systems - Alma
- Great Plains Regional Medical Center - North Platte
- Holdrege VA Medical Center - Holdrege

Community Facilities Goals and Policies

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.

Policies

EDU-1.1 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 Furnas 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.

Policies

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 that will be needed in the future.

Fire Protection, Law Enforcement, and Public Safety Goals

Safety (Fire Protection, Rescue and Ambulance) Goal 1

The goal of Furnas 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.

Policies

SAFE -1.1 The county should continue to work with the different elements of the fire and rescue to maintain quality equipment levels.

SAFE-1.2 The fire departments should continue to expand fire safety education and prevention throughout the county.

Safety (Law Enforcement) Goal 2

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

Policies

SAFE -2.1 Continue to identify specific ways to work cooperatively with the County Sheriff regarding protection in Furnas County.

SAFE-2.2 Continue to support minimum standards regarding equipment used by law enforcement.

Safety (General Health and Safety) Goal 3

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

Policies

SAFE-3.1 Establish regulations protecting the City residents from the secondary effects of adult entertainment.

SAFE-3.2 Establish zoning regulations focused on protecting the health, safety and general welfare of the county residents.

7

Natural Resources and the Environment

Introduction

Formulating a truly usable and workable "comprehensive" plan for the future of Furnas County, it is necessary to evaluate the existing environmental and man-made conditions existing and how these factors may impact future land uses in the County. This component of the Furnas 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
- Wildlife
- Wetlands
- Soil Association
- Capability Grouping
- Prime Farmland
- Soil Limitations

Natural Conditions

Climate

(This information was taken from the Furnas County Soil Survey by the United States Department of Agriculture – Soil Conservation Service – March 1979)

Furnas County has warm summers, cold winters, and rainfall that varies greatly in amount. It is close enough to the Rocky Mountains that the unbroken arrangement of the mountains to the west has a marked influence on the climate. The climate is influenced also by the county's high elevation and its great distance from any large body of water.

Because there are no climatological barriers to the north and south, there are large temperature changes as the wind shifts from southerly to northerly, and vice versa. These changes are more pronounced in winter than in summer… .

As the air masses that originated in the Pacific Ocean move over the Rocky Mountains, they change and arrive in the region comparatively dry. Nearly all the moisture in this area is carried in on warm, moist winds from the Gulf of Mexico... The western edge of the moisture-laden southerly winds is often near the county. An eastward shift of this wind belt can result in a large decrease in rainfall, and a slight westward movement has the opposite effect. There is, therefore, a large variation in annual precipitation. Sometimes, the precipitation begins as rain and changes to snow. One or more periods of freezing rain occur nearly every winter. Slow, steady rains are characteristic early in spring. Nearly all the precipitation in summer is in the form of showers and thundershowers. In fall, thunderstorm activity usually decreases rapidly.

Sharp temperature changes are frequent and extreme in winter. Changes are less frequent in summer, but days with high temperatures are often interspersed with cooler days. In nearly every summer, temperatures reach 100 degrees or higher on one or more' days.

The topography in Furnas County has little effect on average temperatures over a long period of time. Records show, for example, that long-term average temperatures in flat land do not differ greatly from those on small rolling hills or in valleys in the immediate area. Records based on dates when specific temperatures are recorded may, however, differ markedly over short distances.

Physiography, Relief and Drainage

(This information was taken from the Furnas County Soil Survey by the United States Department of Agriculture – Soil Conservation Service – March 1979)

Furnas County is in the Great Plains physiographic province. It is in an area that was once a smooth, gently sloping, loess-mantled plain. Geologic erosion and en-trenchment by tributaries of the Republican River, Sappa Creek, Beaver Creek, and Medicine Creek have modified and dissected the plainlike surface. Between the major stream valleys is an upland landscape of long, narrow, nearly parallel divides and intermittent drainageways. These divides generally are in a north-south direction. Some are as wide as 1 mile, and side slopes are gently sloping to very steep. There are four distinct physiographic positions in Furnas County. These are the alluvial bottom lands, stream terraces, foot slopes, and loess-mantled uplands. Bedrock outcrops in a few areas, mainly on the south breaks to the valleys of Sappa Creek, Beaver Creek, and the Republican River.

The major streams and their principal tributaries are entrenched from 100 to 250 feet below the general ele-vation of the uplands. The valleys of the smaller tributar-ies are cut from 25 to 100 feet below the uplands. The drainageways are mainly V-shaped. They are narrow at their head and become deeper and wider downstream. Catsteps are common on

the steep and very steep slopes. Stream terraces of the major valleys are about 15 to 30 feet above the bottom lands.

Almost all of the county is well drained, and runoff is mainly medium or rapid. Runoff is slow on the bottom lands, stream terraces, and the broad, nearly level divides. Nearly all of the county is drained by the Republican River. Beaver Creek, Sappa Creek, and Medicine Creek are the major tributaries of this 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 land based species. The prolonged presence of water creates conditions favoring 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 Furnas 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

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 appearing 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 interconnection of water, land, and wetlands resources and results in more complete solutions addressing 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. 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. Approximately 75 percent of wetlands are privately owned, so individual landowners are critical in protecting these wetlands.

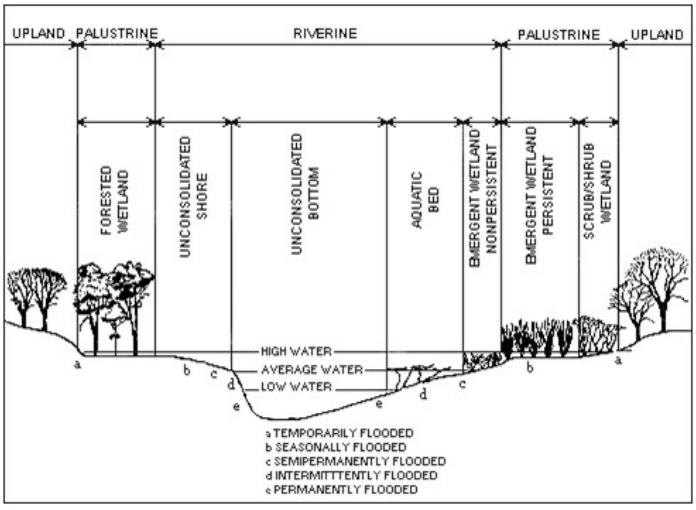
Wetlands play an important role in the ecology of Furnas County. Wetlands are home to many species of wildlife, many of which live only in wetland areas. Wetlands also provide an important service to nearby areas by holding and retaining floodwaters. These

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 are found in Nebraska. Further information, through NWI, on specific classifications is available.

FIGURE 7.1: RIVERINE WETLAND SYSTEM



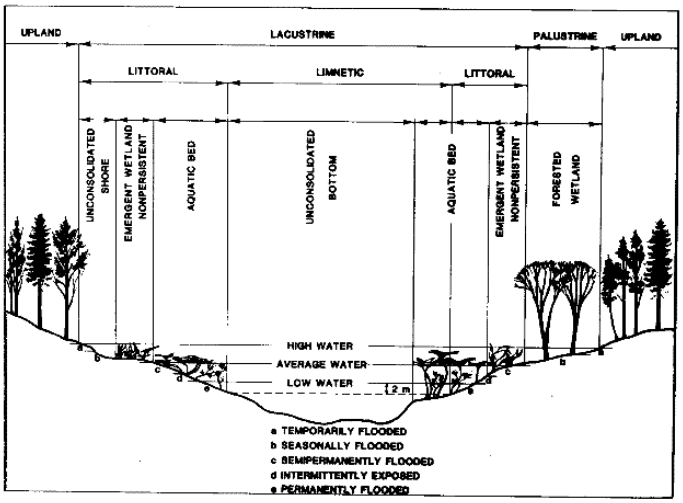
Source: National Wetlands Inventory

Furnas County experiences each of these three other wetland systems. These systems are typically found adjacent to and near the Republican River valley. However, wetlands of varying sizes and types are located throughout Furnas County. The following figures depict common ways in which these three systems develop. 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." Figures 7.1, 7.2, and 7.3 depict common examples of the riverine, lacustrine, and palustrine wetlands, respectively. Figure 7.4 shows the occurrence of wetlands in Furnas County.

Figure 7.1 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 7.2: LACUSTRINE WETLAND SYSTEM



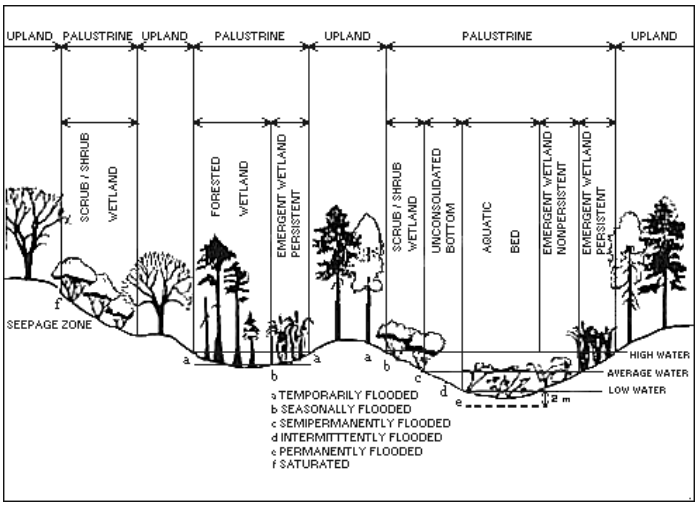
Source: National Wetlands Inventory

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 7.3: 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 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

(This information was taken from the Furnas County Soil Survey by the United States Department of Agriculture – Soil Conservation Service – March 1979)

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. It is named for the major soils. The soils making up one association can occur in other associations but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable and unsuitable soils can be identified on the map.

Because of its small 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.

SOIL ASSOCIATIONS

Silty soils on uplands and foot slopes

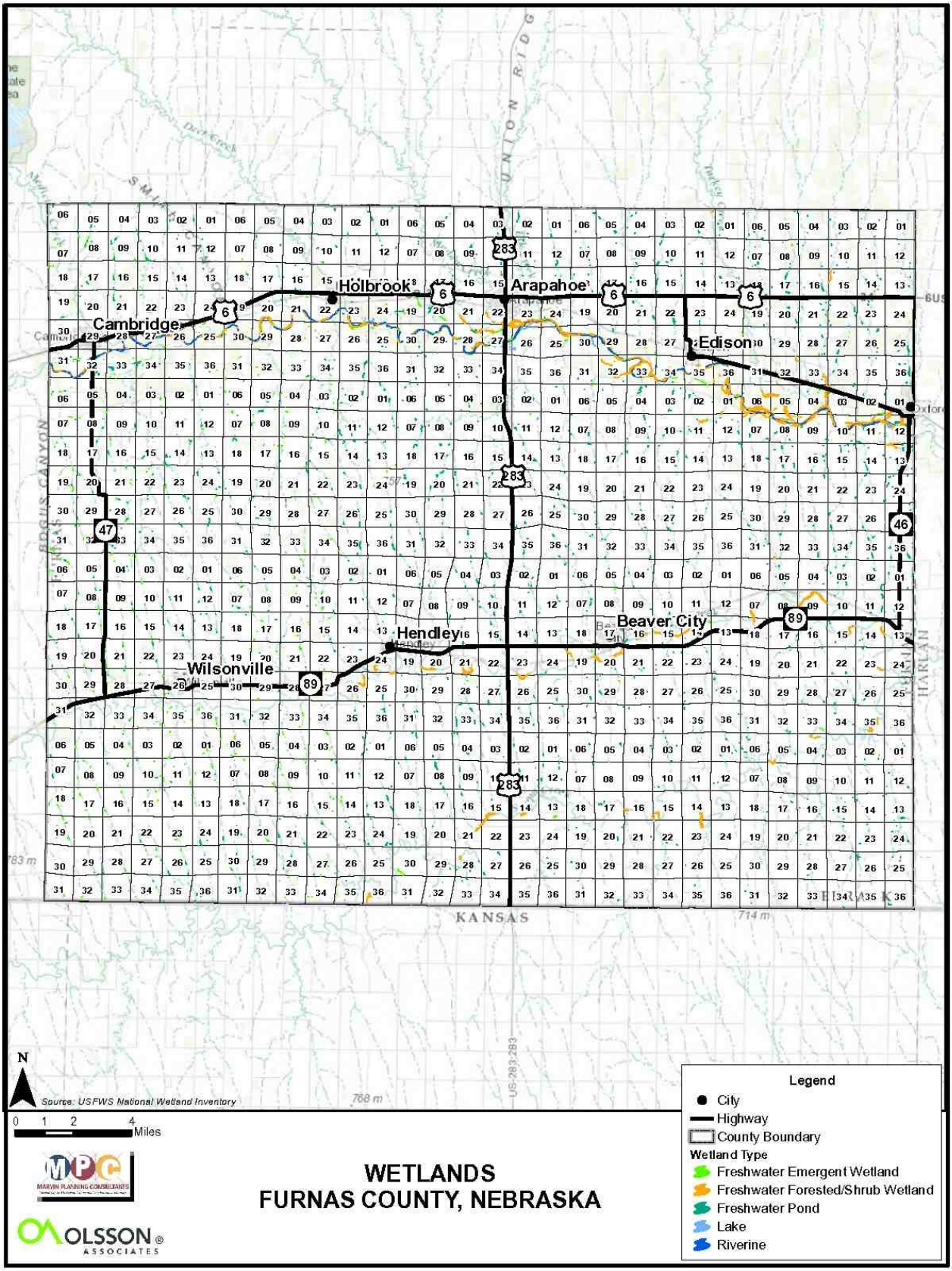
Two associations are in this group. The soils are gently sloping to steep and are well drained and somewhat excessively drained. Most of the acreage, except for small areas of introduced or native grasses near farmsteads and on steep slopes, is cultivated under dryland management. Some areas, where high-yielding wells are available, are irrigated, mainly by a center-pivot system. Erosion by water is the main hazard. Maintaining a high level of fertility, controlling runoff, and conserving moisture for plants are the main concerns of management.

1. Holdrege-Uly association

Deep, nearly level to strongly sloping, well drained silty soils; on divides of loess mantled uplands

This soil association consists of alternating broad, nearly level divides and gently sloping to strongly sloping side slopes on the uplands, see Figure 7.5. Most intermittent drainageways are entrenched to a shallow depth.

Figure 7.4: Wetlands Map



This soil association makes up about 44 percent of the county. It is about 72 percent Holdrege soils, 16 percent Uly soils, and 12 percent minor soils and miscellaneous areas.

Holdrege soils are deep and well drained and are on broad divides of the uplands. They are nearly level to gently sloping. The surface layer is very friable silt loam about 11 inches thick. The subsoil is friable silty clay loam about 19 inches thick. The underlying material, to a depth of 60 inches, is lighter colored calcareous silt loam.

Uly soils are deep and well drained and are on the upper part of some side slopes. They are very gently sloping to strongly sloping. They are commonly in areas below Holdrege soils and above Coly soils. The surface layer is very friable silt loam about 10 inches thick. The subsoil is also very friable silt loam about 10 inches thick. The underlying material is lighter colored calcare-ous silt loam.

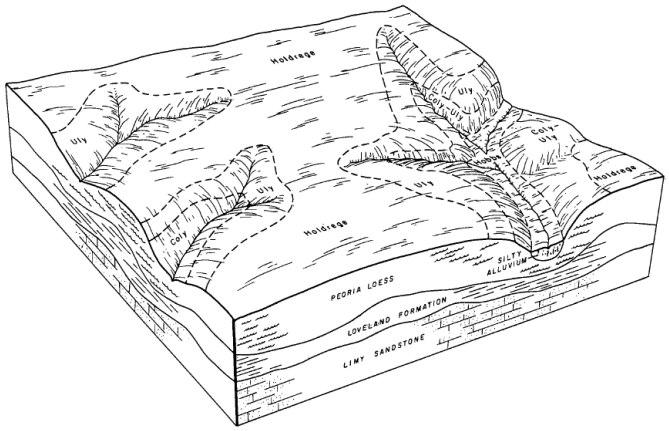
The minor soils include Coly, Hobbs, and Fillmore soils. The weakly developed Coly soils are on side slopes and are commonly in a complex with Uly soils. The stratified Hobbs soils are on the bottoms of narrow drainageways. The very slowly permeable Fillmore soils are in shallow depressions on the uplands.

Farms in this association are diversified; they are mainly cash grain and livestock raising farms. Wheat and grain sorghum are the most important crops and are grown under dryland management. A few areas, mainly north of the Republican River, are irrigated, but, for the most part, the potential is low for increased use for irrigated crops. Either a gravity system or center pivot sprinklers are used for irrigation. Corn, alfalfa, and grain sorghum are the main irrigated crops. Cattle and hogs are fattened in a few feedlots. A few farmers have a small cow-calf herd and sell the calves as feeders. Only a small acreage is range.

Water erosion, soil blowing, and drought are the main hazards on the dryfarmed soils. Maintaining fertility and managing irrigation water and crop residue are concerns on irrigated land. Conserving water is important under both dryland and irrigation management.

Gravel or improved dirt roads are on most section lines. Several paved highways cross the area. Most of the cash grain crops are marketed at elevators in the county, but grain sorghum, aifalfa, and corn are commonly fed to livestock directly on the farm. Fattened livestock general-ly is trucked to large terminals.

FIGURE 7.5: TYPICAL NORA-CROFTON-MOODY ASSOCIATION



2. Coly-Uly-Holdrege association

Deep, gently sloping to very steep, somewhat excessive-ly drained and well drained silty soils; on divides and side slopes of loess mantled uplands

This soil association is on the loess. uplands and, con-sists of narrow, gently sloping divides and strongly slop-ing to very steep side slopes, see Figure 7.6. The drainageways are mostly intermittent; some are fed by springs.

This soil association makes up about 35 percent of the county. It is about 55 percent Coly soils, 22 percent Uly soils, 11 percent Holdrege soils, and 12 percent minor soils.

Coly soils are deep and are well drained and somewhat excessively drained. These soils are mainly on side slopes; some are on narrow ridgetops. They are gently Sloping to very steep. in a typical profile, the surface layer is friable silt loam about 5 inches thick. Below that there is a transitional layer of calcareous silt loam about 7 inches thick. The underlying material, to a depth of 60 inches, is lighter colored calcareous silt loam. In many places, Coly soils are in a complex with Uly, Nuckolls, or Holdrege soils.

Uly soils are deep and well drained. These soils are on side slopes and ridgetops. They are gently sloping to steep. In a typical profile, the surface layer is very friable silt loam about 10 inches thick. The subsoil is also very friable silt loam about 10 inches thick, but it is browner than the surface

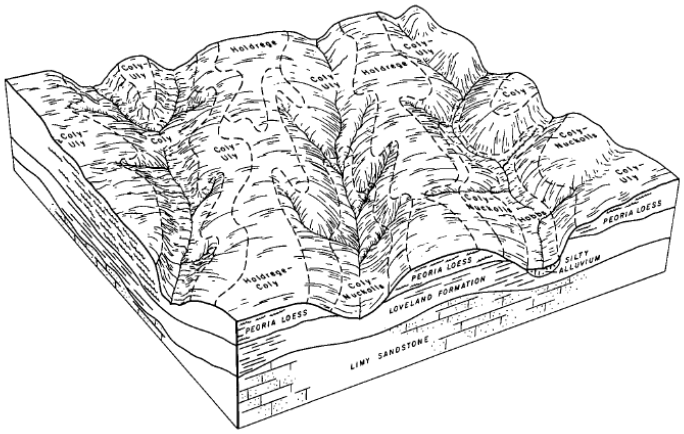
layer. The underlying material, to a depth of 60 inches, is lighter colored calcareous silt loam. In many places, Uly soils are in a complex with Coly soils.

Holdrege soils are deep and well drained and are on narrow divides. They are gently sloping. In a typical pro-file, the surface layer is very friable silt loam about 11 inches thick. The subsoil is friable silty clay loam about 19 inches thick. The underlying material is lighter colored calcareous silt loam. In places, Holdrege soils are in a complex with Coly soils.

The minor soils include the brownish colored Nuckolls soils on the lower part of side slopes, the stratified Hobbs soils on the bottoms of narrow drainageways, and the Campus and Canyon soils, which formed in caliche, on upland side slopes.

Farms in this association are mainly for growing cash grain crops and for raising livestock. Soils on the divides and on smooth side slopes are used mainly for dryland cultivated crops. Winter wheat and grain sorghum are important crops and are grown under dryland manage-ment. Only a few areas are irrigated. The moderately steep and steep areas are mainly used as range. Small cow-calf herds are common. Some areas that were for-merly cropland have been seeded to native grass. The potential is low for more irrigation mainly because of the slope.

FIGURE 7.6: COLY-ULY-HOLDREGE ASSOCIATION



Water erosion is the main hazard if the soils are cultivated. Soil blowing and drought are also hazards. Proper range use, deferred grazing, and planned grazing systems are needed on rangeland.

Gravel or improved dirt roads are on most section lines. A few hard surfaced highways cross the area. Much of the grain sorghum is fed to livestock on the farm. Winter wheat is sold at local elevators. Some beef cattle, mainly calves, are sold as feeders at local auctions, and some are fattened on the farm and sold at large terminals such as Omaha and Denver.

3. Gibbon-McCook-Invale association

Deep, nearly level, somewhat poorly drained, moderately well drained, and somewhat excessively drained silty, loamy, and sandy soils; on bottom lands

This soil association is mainly on nearly level bottom lands of the Republican River Valley, see Figure 7.7.

This association makes up about 6 percent of the county. It is about 28 percent Gibbon soils, 26 percent McCook soils, 18 percent Inavale soils, and 28 percent minor soils, gravel pits, and areas of water.

Gibbon soils are deep and are somewhat poorly drained. A seasonal high water table is at a depth of 2 to 4 feet. In a typical profile, the surface layer is about 16 inches thick. It is friable silt loam in the upper part and silty clay loam in the lower part. Below that there is a lighter colored transitional layer of very friable silt loam 4 inches thick. The underlying material is light gray very fine sandy loam and silty clay loam in the upper part and is loamy fine sand in the lower part. Gibbon soils are calcareous throughout the profile.

McCook soils are deep and are moderately well drained. In a typical profile, the surface layer is very friable silt loam about 13 inches thick. Below that is a transitional layer of very friable loam. The underlying material is lighter colored very fine sandy loam and loam. These soils are calcareous at or near the surface.

Inavale soils are deep and are somewhat excessively drained. In a typical profile, the surface layer is very friable loamy fine sand about 5 inches thick. Below that there is a transitional layer of loose, slightly lighter col-ored loamy fine sand. The underlying material, to a depth of 60 inches, is stratified sand, loamy sand, and loamy very fine sand.

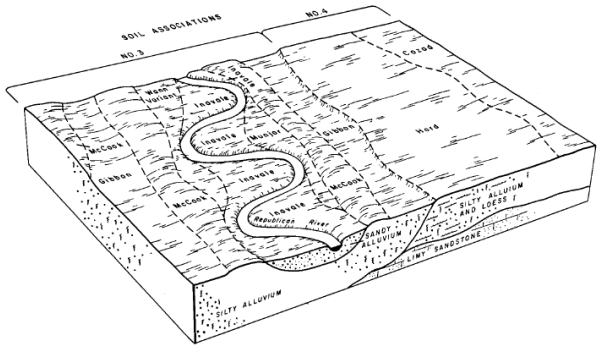
The minor soils include the somewhat poorly drained Wann Variant soils, the well drained Munjor soils, and the very poorly drained Barney soils. Barney soils are shallow over mixed sand and gravel and are in low swales. Also included are channels of the Republican River and a few gravel pits.

Farms in this association are diversified and are cash grain and livestock raising farms. Most of the acreage is irrigated. Corn and alfalfa are the main crops. A smaller acreage, mainly near the river channels, is in native grass and trees and is mainly used for range or as habitat for wildlife. The wheat is sold for cash, but grain sorghum and corn are fed on the farm to hogs, chickens, or to cattle in drylots. Irrigation water is plentiful. It mainly comes from shallow wells and is distributed by gravity systems. Only a few sprinkler systems are used.

Soil blowing is the main hazard if the soils are cultivated. Maintaining soil fertility and properly managing irriga-tion water are concerns if the land is irrigated. Flooding is occasional or rare and can cause crop losses, particularly in the lowest areas.

Gravel or dirt roads are common; however, several hard surfaced highways cross the area. Cash grain is market-ed mainly to elevators within the county. Most feeder calves are sold at local auctions, and fattened livestock is trucked to large terminals.

FIGURE 7.7: GIBBON-MCCOOK-INAVALE ASSOCIATIONS



4. Hord-Cozad association

Deep, nearly level and very gently sloping, well drained silty soils; on stream terraces and foot slopes

This soil association is on stream terraces of the Republican River Valley and on foot slopes adjacent to uplands, Figure 7.7. The areas are mainly nearly level, but a few are very gently sloping.

This soil association makes up about 6 percent of the county. It is about 53 percent Hord soils, 27 percent Cozad soils, and 20 percent minor soils.

Hord soils are deep and are well drained. They are on stream terraces and foot slopes. They are nearly level or gently sloping. In a typical profile, the surface layer is very friable silt loam about 17 inches thick. The subsoil is very friable silt loam about 22 inches thick, and it is browner than the surface layer. Below that, a buried soil that is silt loam and silty clay loam extends to a depth of 60 inches. The soil material is calcareous below a depth of 44 inches.

Cozad soils are deep and well drained. They are on stream terraces and foot slopes. They are nearly level or gently sloping. In a typical profile, the surface layer is very friable silt loam about 14 inches thick. The subsoil is also very friable silt loam about 14 inches thick; it is not so dark in color as the surface layer. The underlying material is lighter colored very fine sandy loam. A buried horizon of silt loam is at a depth of 54 inches. Cozad soils are calcareous below a depth of about 15 inches.

The minor soils include the well drained Hall soils on stream terraces, the moderately coarse textured Anselmo soils on stream terraces, and the stratified Hobbs soils on foot slopes and narrow bottom lands. Farms in this association are mainly cash grain farms. The main crop is corn. Alfalfa and forage crops are grown on a small acreage and are used mainly as live-stock feed. Cattle and some hogs are fattened in a few feedlots. Some grain sorghum is grown for feeding on the farm. Most of the acreage is irrigated by water from wells. The water is distributed mainly by the gravity system, but a few sprinkler systems are also used. Dryfarmed corn, grain sorghum, and wheat also are grown on a small acreage.

Maintaining soil fertility and managing irrigation water are the main concerns of management. Soil blowing and water erosion are minor hazards.

These farms are among the most productive in Furnas County. Gravel roads are on most section lines, and there are several hard-surfaced

highways. The towns of Cambridge, Holbrook, Arapahoe, and Oxford in this association are marketing and shopping centers for the northern half of the county. Cash grain is marketed at local elevators. Fattened livestock is trucked to large terminals.

5. Hord-Hobbs-Cozad association

Deep, nearly level to gently sloping, well drained silty soils; on stream terraces, bottom lands, and foot slopes

This soil association is mainly on stream terraces and bottom lands of Beaver, Sappa, Medicine, and Deer Creeks. It is also on foot slopes adjacent to the uplands. The areas are mainly nearly level or very gently sloping, but a few are gently sloping, Figure 7.8.

This soil association makes up about 9 percent of the county. It is about 28 percent Hord soils, 27 percent Hobbs soils, 17 percent Cozad soils, and 28 percent minor soils.

Hord soils are deep. They are mainly on stream terraces, but in a few areas they are on foot slopes. They are nearly level to gently sloping. In a typical profile, the surface layer is very friable silt loam about 17 inches thick. The subsoil is very friable silt loam about 22 inches thick, and it is slightly lighter in color than the surface layer. A buried soil that is silt loam and light silty clay loam is below a depth of 39 inches. Hord soils are calcareous below a depth of about 44 inches.

Hobbs soils are deep and nearly level. They are on bottom lands. They are frequently flooded where they are adjacent to creek channels and are occasionally flooded where they are on the second bottoms. The surface layer is very friable silt loam about 24 inches thick; the upper part is stratified. The underlying material is slightly browner silt loam. A buried soil that is silt loam is at a depth of 37 inches.

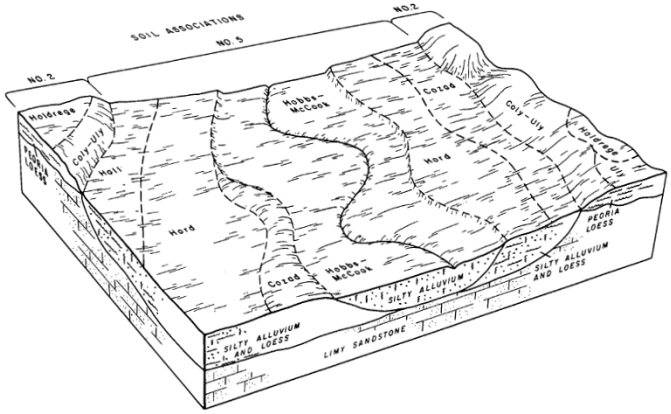
Cozad soils are deep. They are mainly on bottom lands but are on foot slopes in a few areas. They are nearly level to gently sloping. The surface layer is very friable silt loam about 14 inches thick. The subsoil is very friable silt loam, and it is slightly lighter colored than the surface layer. The underlying material, to a depth of 54 inches, is grayer very fine sandy loam. Below that there is a buried soil that is silt loam.

The minor soils include the well drained Hall soils on stream terraces, the moderately well drained, calcareous McCook soils on bottom lands, and the somewhat poorly drained Gibbon soils on bottom lands.

Most farms in this association are diversified and are cash grain and livestock raising farms. Grain sorghum and winter wheat are the main dryfarmed crops. There is a smaller acreage of corn and alfalfa. A few farms, mainly in the Beaver Creek Valley, are irrigated by the gravity system using water from moderately shallow wells. Corn, alfalfa, and grain sorghum are the main irrigated crops. A few farmers fatten hogs and cattle in small feedlots. Only a small acreage is in permanent vegetation, mainly in the frequently flooded areas along stream channels.

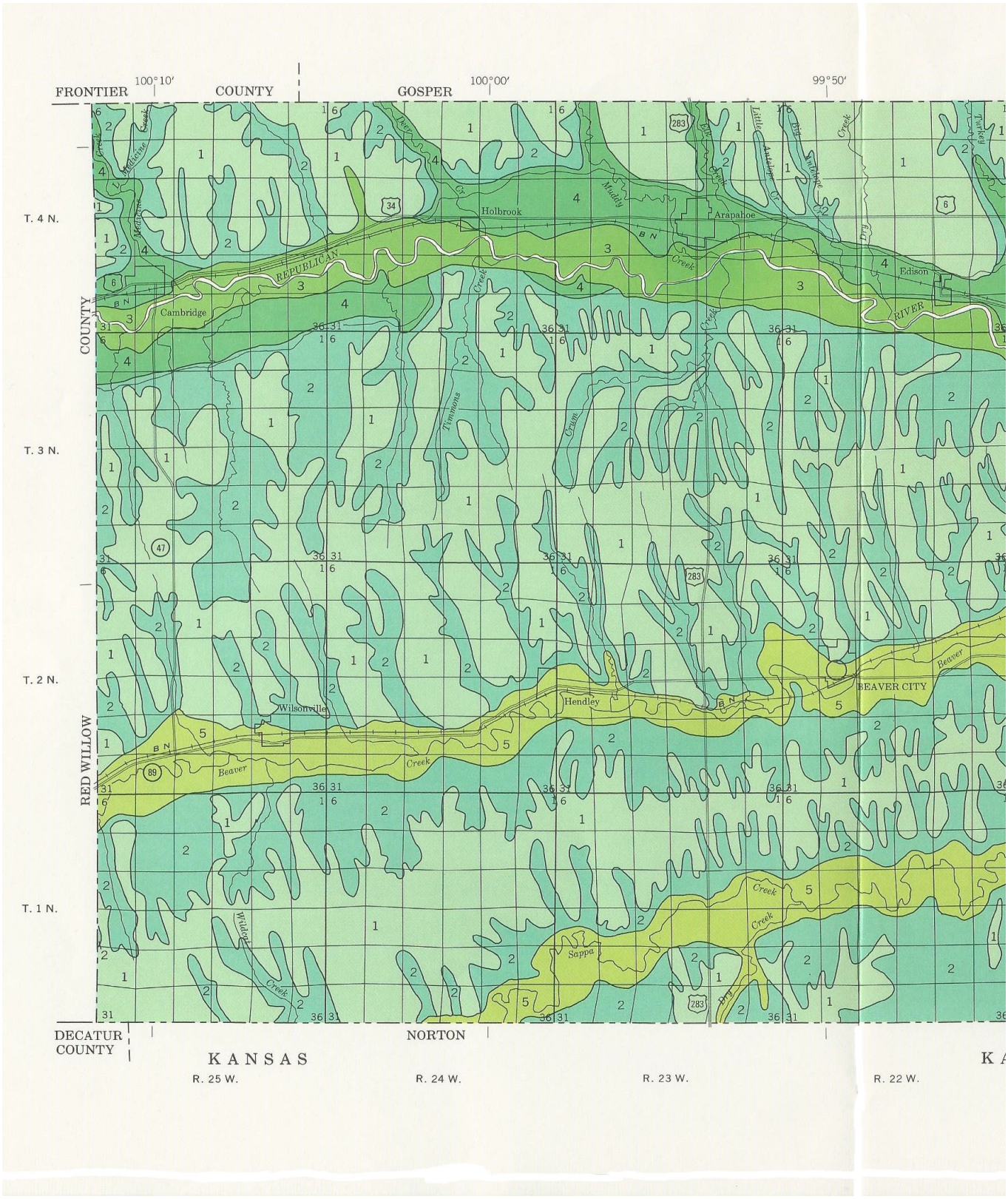
Maintenance of fertility, proper management of irriga-tion water, and crop residue management are the main concerns if the land is irrigated. Soil blowing and drought are hazards on dryfarmed cropland. Conservation of water is important on dryland and irrigated fields.

FIGURE 7.8: HORD-HOBBS-COZAD ASSOCIATIONS



Gravel roads are on most section lines. State Highway 89 runs through most of the valley of Beaver Creek. The towns of Wilsonville, Hendley, and Beaver City are marketing and shopping centers in this association. Wheat is sold at local elevators. Most of the corn, alfalfa, and sorghum is fed to livestock on the farm. Fattened livestock generally is trucked to large terminals.

FIGURE 7.9: GENERAL SOILS MAP



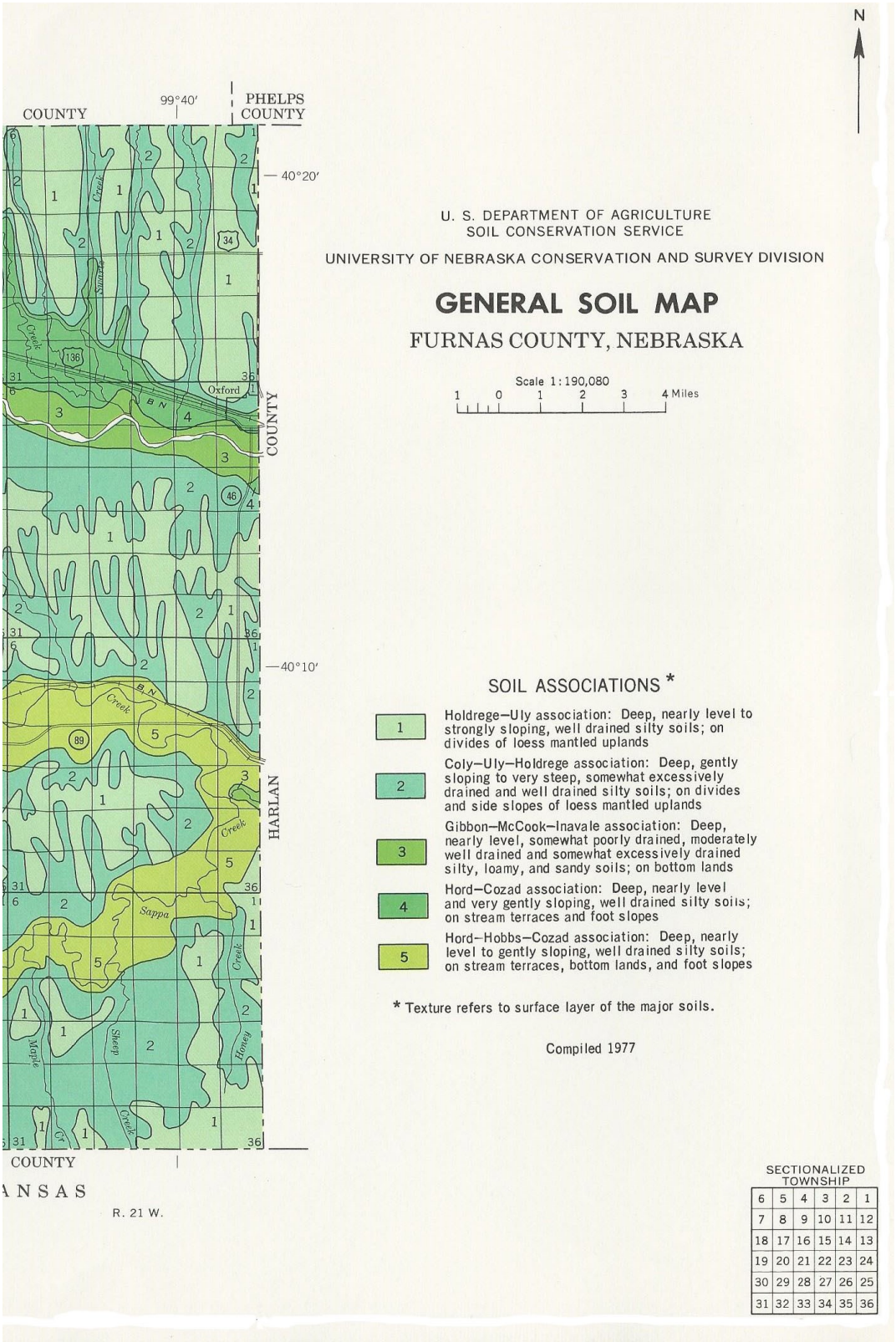

N
99°40′
PHELPS COUNTY
COUNTY
40°20′
40°10′
Oxford
HARLAN COUNTY
COUNTY
NSAS
R. 21 W.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF NEBRASKA CONSERVATION AND SURVEY DIVISION
GENERAL SOIL MAP
FURNAS COUNTY, NEBRASKA
Scale 1:190,080
1 0 1 2 3 4 Miles
SOIL ASSOCIATIONS *
1 Holdrege–Uly association: Deep, nearly level to strongly sloping, well drained silty soils; on divides of loess mantled uplands
2 Coly–Uly–Holdrege association: Deep, gently sloping to very steep, somewhat excessively drained and well drained silty soils; on divides and side slopes of loess mantled uplands
3 Gibbon–McCook–Inavale association: Deep, nearly level, somewhat poorly drained, moderately well drained and somewhat excessively drained silty, loamy, and sandy soils; on bottom lands
4 Hord–Cozad association: Deep, nearly level and very gently sloping, well drained silty soils; on stream terraces and foot slopes
5 Hord–Hobbs–Cozad association: Deep, nearly level to gently sloping, well drained silty soils; on stream terraces, bottom lands, and foot slopes
* Texture refers to surface layer of the major soils.
Compiled 1977
SECTIONALIZED TOWNSHIP
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36

TABLE 7.1: SOIL PROPERTIES BY TYPE AND USE

Soil Symbol/Soil Name	Dwellings without Basements		Dwellings with Basements		Septic tank and absorption fields	
	Suitability	Conditions	Suitability	Conditions	Suitability	Conditions
9001 Anselmo	0	-	0	-	2	7
6361 Barney	2	1,2	2	1,2	2	1,2,7,3
2511 **Campus**-Canyon	1	5,6	2	6,5	2	6,5,4
2511 Campus-**Canyon**	2	5,6	2	6,5	2	6,5
2526 **Coly**-Nuckolls	2	5	2	5	2	5,4
2526 Coly-**Nuckolls**	2	5	2	5	2	5,4
2528 **Coly**-Uly	0	-	0	-	1	4
2528 Coly-**Uly**	0	-	0	-	1	4
2536 Coly	2	5	2	5	2	5,4
2538 Coly	0	-	0	-	1	4
2541 Coly	1	5	1	5	1	5,4
2548 **Coly**-Nuckolls	1	5	1	5	1	5,4
2548 Coly-**Nuckolls**	1	5,8	1	5,8	2	4,5
2549 **Coly**-Nuckolls	2	5	2	5	2	5,4
2549 Coly-**Nuckolls**	2	5,8	2	5,8	2	4,5
2557 **Coly**-Uly	0	-	0	-	1	4
2557 Coly-**Uly**	0	-	0	-	1	4
2559 **Coly**-Uly	2	5	2	5	2	5,4
2559 Coly-**Uly**	1	5	1	5	1	5,4
2560 **Coly**-Uly-Hobbs	2	5	2	5	2	5,4
2560 Coly-**Uly**-Hobbs	2	5	2	5	2	5,4
2560 Coly-Uly-**Hobbs**	2	1	2	1	2	5,4
8815 Cozad	0	-	0	-	1	4
8816 Cozad	0	-	0	-	1	4
8817 Cozad	0	-	0	-	1	4
3947 Fillmore	2	9,2,8	2	9,2,8	2	9,2,4
8470 Gibbon	2	1,2	2	1,2	2	1,2,7
8817 Gibbon	2	1,2,8	2	1,2,8	2	1,2,4
8840 Hall	1	8	0	-	2	4
3545 Hobbs	2	1	2	1	2	1,4
3561 Hobbs	2	1	2	1	2	1,4
3562 Hobbs	2	1,8	2	1,8	2	1,4
3563 **Hobbs**-McCook	2	1	2	1	2	1,4
3563 Hobbs-**McCook**	2	1	2	1	2	1,4
2673 Holdrege	1	8	0	-	2	4
2674 Holdrege	1	8	0	-	2	4
2675 Holdrege	1	8	0	-	1	4
2676 Holdrege	0	-	0	-	1	4
4151 **Holdrege**-Coly	0	-	0	-	1	4
4151 Holdrege-**Coly**	0	-	0	-	1	4
4152 **Holdrege**-Coly	0	-	0	-	1	4
4152 Holdrege-**Coly**	0	-	0	-	1	4

TABLE 7.1: SOIL PROPERTIES BY TYPE AND USE CONT.

Soil Symbol/Soil Name	Dwellings without Basements		Dwellings with Basements		Septic tank and absorption fields	
	Suitability	Conditions	Suitability	Conditions	Suitability	Conditions
4156 **Holdrege**-Uly	0	-	0	-	1	4
4156 Holdrege-**Uly**	0	-	0	-	1	4
4157 **Holdrege**-Uly	0	-	0	-	1	4
4157 Holdrege-**Uly**	0	-	0	-	1	4
8866 Hord	0	-	0	-	1	4
8870 Hord	0	-	0	-	2	4
8872 Hord	0	-	0	-	2	4
2355 Inavale	2	1	2	1	2	1,7,3
4121 **Keith**-Holdrege	0	-	0	-	1	4
4121 Keith-**Holdrege**	0	-	0	-	1	4
2347 McCook	2	1	2	1	1	4,1
2360 Munjor	0	-	0	-	2	7,3
2577 **Nuckolls**-Uly-Canlon	2	5	2	5	2	5,4
2577 Nuckolls-**Uly**-Canlon	2	6,5	2	6,5	2	6,5
2577Nuckolls-Uly-**Canlon**	2	5	2	5	2	5,4
2815 Uly	0	-	0	-	1	4
2819 Uly	0	-	0	-	1	4
2820 Uly	0	-	0	-	1	4
8593 Wann variant	2	1	2	1,2	2	1,2,7

Legend for Table 7.1

Suitability

0 = Not Limited

1 = Somewhat Limited

2 = Very Limited

Conditions

1= Flooding

2 = Depth to saturated zone

3 = Filter capacity

4 = Slow water movement

5 = Slope

6 = Depth to soft or hard Bedrock

7 = Seepage

8 = Shrink-swell

9 = 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.

Filter capacity 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 Furnas County the class of slopes are:

Nearly level	0 to 2%
Very gently sloping	1 to 3%
Gently sloping	3 to 6%
Strongly sloping	6 to 9%
Moderately sloping	9 to 15%
Steep	15 to 30%
Very steep	30 to 60%

Depth to Rock means typically a soil that has limited distance to bedrock of some kind.

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

Shrink-swell means that 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

Ponding means standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

TABLE 7.2: PERMEABILITY/SHRINK-SWELL BY SOIL TYPE

Soil Symbol/Soil Name	Depth (inches)	Permeability (in/hr)	Shrink-swell potential
9001 Anselmo	0-14 14-33 33-60	2.0-6.0 2.0-6.0 2.0-6.0	Low Low Low
6316 Barney	0-10 **10-18** **18-60**	0.2-0.6 **6.0-20.0** **6.0-20.0**	Low Low Low
2511 **Campus**-Canyon	0-9 9-21 21-39 39-60	0.6-2.0 0.6-2.0 0.6-2.0 1.4-14.1	Low Low Low -
2511 Campus-**Canyon**	0-9 9-12 12-60	0.6-2.0 0.6-2.0 1.4-14.1	Low Low -
2526 **Coly**-Nuckolls	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
2526 Coly-**Nuckolls**	0-7 7-32 32-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
2528 **Coly**-Uly	0-6 6-13 13-79	0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Low
2528 Coly-**Uly**	0-6 6-12 12-18 18-79	0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium Low
2536 Coly	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
2538 Coly	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
2541 Coly	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
2548 **Coly**-Nuckolls	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
2548 Coly-**Nuckolls**	0-14 14-28 28-60	0.6-2.0 0.2-0.6 0.2-0.6	Low Low Medium
2549 **Coly**-Nuckolls	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
2549 Coly-**Nuckolls**	0-14 14-28 28-60	0.6-2.0 0.2-0.6 0.2-0.6	Low Medium Medium
2557 **Coly**-Uly	0-6 6-13 13-79	0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Low
2557 Coly-**Uly**	0-6 6-12 12-21 21-79	0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium Low
2559 **Coly**-Uly	0-5 5-10 10-79	0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium
2559 Coly-**Uly**	0-6 6-10 10-17 17-79	0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium Low
2560 **Coly**-Uly-Hobbs	0-4 4-60	0.6-2.0 0.6-2.0	Low Low
2560 Coly-**Uly**-Hobbs	0-5 5-16 16-80	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
2560 Coly-Uly-**Hobbs**	0-7 7-34 34-80	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
8815 Cozad	0-12 12-60	0.6-2.0 0.6-2.0	Low Low
8816 Cozad	0-12 12-60	0.6-2.0 0.6-2.0	Low Low
8817 Cozad	0-12 12-60	0.6-2.0 0.6-2.0	Low Low
3947 Fillmore	0-15 15-37 37-60	0.2-0.6 < 0.06 0.06-0.2	Medium **Very High** **Very High**
8470 Gibbon	0-16 16-20 20-60	0.6-2.0 0.6-2.0 0.6-6.0	Low Low Low
8472 Gibbon	0-16 16-20 20-60	0.6-2.0 0.6-2.0 0.2-0.6	Low Low Medium
8840 Hall	0-8 8-40 40-60	0.6-2.0 0.2-0.6 0.6-2.0	Low Medium Low
3545 Hobbs	0-9 9-24 24-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
3561 Hobbs	0-6 6-79	0.6-2.0 0.6-2.0	Medium Medium
3562 Hobbs	0-6 6-79	0.6-2.0 0.6-2.0	**High** **High**
3563 **Hobbs**-McCook	0-9 9-24 24-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
3563 Hobbs-**McCook**	0-15 15-60	0.6-2.0 0.6-2.0	Low Low
2673 Holdrege	0-6 6-11 11-17 17-27 27-34 34-79	0.6-2.0 0.6-2.0 0.2-0.6 0.2-0.6 0.6-2.0 0.6-2.0	Medium Medium Medium Medium Medium Low
2674 Holdrege	0-6 6-11 11-16 16-26 26-33 33-79	0.6-2.0 0.6-2.0 0.2-0.6 0.2-0.6 0.6-2.0 0.6-2.0	Medium Medium Medium Medium Medium Low
2675 Holdrege	0-6 6-10 10-14 14-23 23-31 31-79	0.6-2.0 0.6-2.0 0.2-0.6 0.2-0.6 0.6-2.0 0.6-2.0	Medium Medium Medium Medium Medium Low
2676 Holdrege	0-7 7-11 11-20 20-28 28-79	0.6-2.0 0.2-0.6 0.2-0.6 0.6-2.0 0.6-2.0	Medium Medium Medium Medium Low

Soil Suitability

The characteristics of soils play a major role in

Soil Symbol/Soil Name	Depth (inches)	Permeability (in/hr)	Shrink-swell potential
4151 **Holdrege**-Coly	0-11 11-19 19-30 30-60	0.6-2.0 0.2-0.6 0.6-2.0 0.6-2.0	Low Medium Medium Low
4151 Holdrege-**Coly**	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
4152 **Holdrege**-Coly	0-11 11-19 19-30 30-60	0.6-2.0 0.2-0.6 0.6-2.0 0.6-2.0	Low Medium Medium Low
4152 Holdrege-**Coly**	0-5 5-60	0.6-2.0 0.6-2.0	Low Low
4156 **Holdrege**-Uly	0-6 6-15 15-20 20-60	0.6-2.0 0.2-0.6 0.6-2.0 0.6-2.0	Medium Medium Medium Medium
4156 Holdrege-**Uly**	0-6 6-15 15-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
4157 **Holdrege**-Uly	0-8 8-11 11-14 14-60	0.6-2.0 0.2-0.6 0.6-2.0 0.6-2.0	Medium Medium Medium Medium
4157 Holdrege-**Uly**	0-5 5-9 9-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
8866 Hord	0-20 20-36 36-79	0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium
8870 Hord	0-17 17-44 44-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
8872 Hord	0-17 17-44 44-60	0.6-2.0 0.6-2.0 0.2-0.6	Low Low Low
2355 Inavale	**0-5** **5-14** **14-60**	**6.0-20.0** **6.0-20.0** **6.0-20.0**	Low Low Low
4121 **Keith**-Holdrege	0-7 7-19 19-79	0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium
4121 Keith-**Holdrege**	0-7 7-19 19-79	0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium
2374 McCook	0-6 6-14 14-26 26-79	0.6-2.0 0.6-2.0 0.6-20.0 0.6-2.0	Low Low Low Low
2360 Munjor	0-18 **18-34** **34-60**	2.0-6.0 **6.0-20.0** **6.0-20.0**	Low Low Low
2577 Nuckolls-Uly-Canlon	0-9 9-26 26-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Medium Medium
2577 Nuckolls-Uly-Canlon	0-5 5-18 18-60	0.6-2.0 0.6-2.0 -	Low Low -

Soil Symbol/Soil Name	Depth (inches)	Permeability (in/hr)	Shrink-swell potential
2577 Nuckolls-Uly-Canlon	0-9 9-16 16-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
2815 Uly	0-10 10-20 20-60	0.6-2.0 0.6-2.0 0.6-2.0	Low Low Low
2819 Uly	0-6 6-10 10-17 17-79	0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium Low
2820 Uly	0-6 6-10 10-17 17-79	0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0	Medium Medium Medium Low
8593 Wann variant	**0-5** **5-42** **42-60**	**2.0-6.0** **2.0-6.0** **2.0-6.0**	Low Low Low

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. In addition, as noted in the capabilities section, 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 Furnas County. These conditions and how they factor into a soils ability to support certain types of uses is referred to limitations.

Finally, if a soil has some level of limitation, it does not mean different uses cannot be constructed in those soils. However, the key to this is focused on the fact that special engineering solutions may need to be implemented in order to overcome these specific sol 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 with the soils of Furnas County. Ratings are used to summarize limitation or suitability of the soils for all listed purposes other than for drainage of cropland and pasture; irrigation; pond reservoir areas; embankments, dikes, and levees; and terraces and diversions.

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

- **Not Limited** means soil properties are generally favorable for the rated use. Limitations are nonexistent, minor and/or 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 are so unfavorable and so difficult to correct or overcome as to require major soil reclamation, special designs, or intensive maintenance.

Dwellings without Basements

Figure 7.10 shows the soil suitability conditions for constructing dwelling without a basement (slab on-grade construction). In addition Table 7. 1 provides the suitability by soil types and the specific conditions impacting the soil.

Based upon the Table 7.1, there are 27 soils with no limitations. These soils are located predominately along US Highway 6/34 near Cambridge (south), Holbrook (north), Arapahoe (north) and Edison (north). In addition, these soils are found along Nebraska 89, scattered between Harlan and red Willow Counties.

The soils rated as somewhat limited are found in nine different soils. These soils are scattered in masses throughout the county. The most common limitations needing to be overcome are:

- slopes
- depth to either soft or hard bedrock, and
- shrink-swell

The soils rated as very limited make up the remaining soils and areas of Furnas County. These areas are typically in the valleys throughout the county. The most predominant limitations for dwellings without basements are:

- Flooding
- Depth to saturated soils
- Slope
- Depth to either soft of hard bedrock,
- Ponding, and
- Shrink-swell.

Dwellings with Basements

Figure 7.11 examines the suitability conditions for constructing dwelling with basements. Table 7.1 provides the suitability by soil types and the specific conditions impacting the soil.

Based upon the Table 7.1, there are 30 soils considered to have no limitations. These soils are scattered throughout the county. However, with the same soils for both this use and dwellings without basements, there are considerably more areas to build in Furnas County.

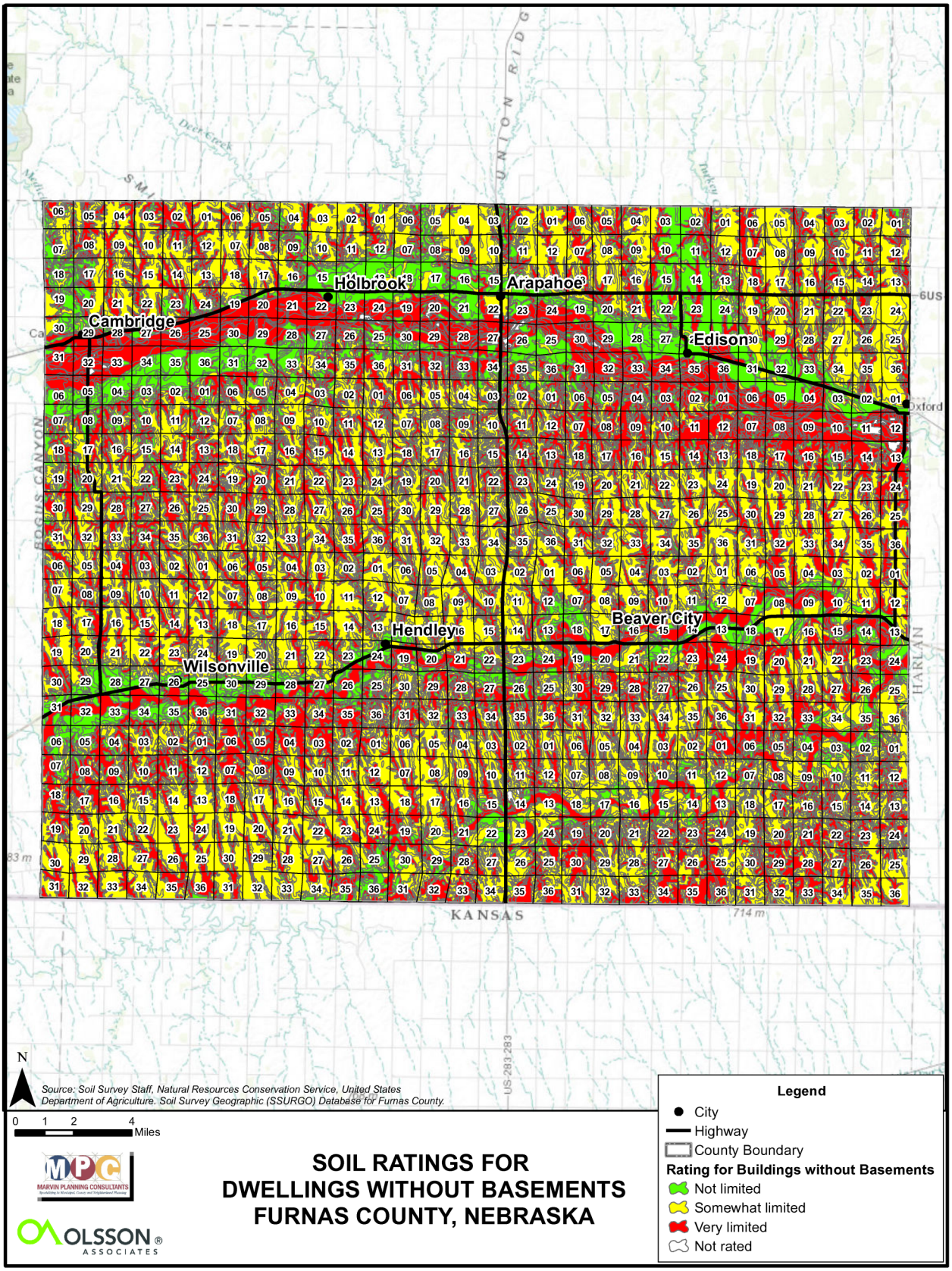
The soils rated as somewhat limited are found in four different soils. These soils are found toward the southeast corner of the county. As with the dwellings without basements the most common limitations needing to be overcome are:

- slopes
- shrink-swell

The soils rated as very limited are identical to those dwellings without basements.

Figure 7.10: Dwellings without Basements

FIGURE 7.10: DWELLINGS WITHOUT BASEMENTS



FIGURE

FIGURE 7.11: DWELLINGS WITH BASEMENTS

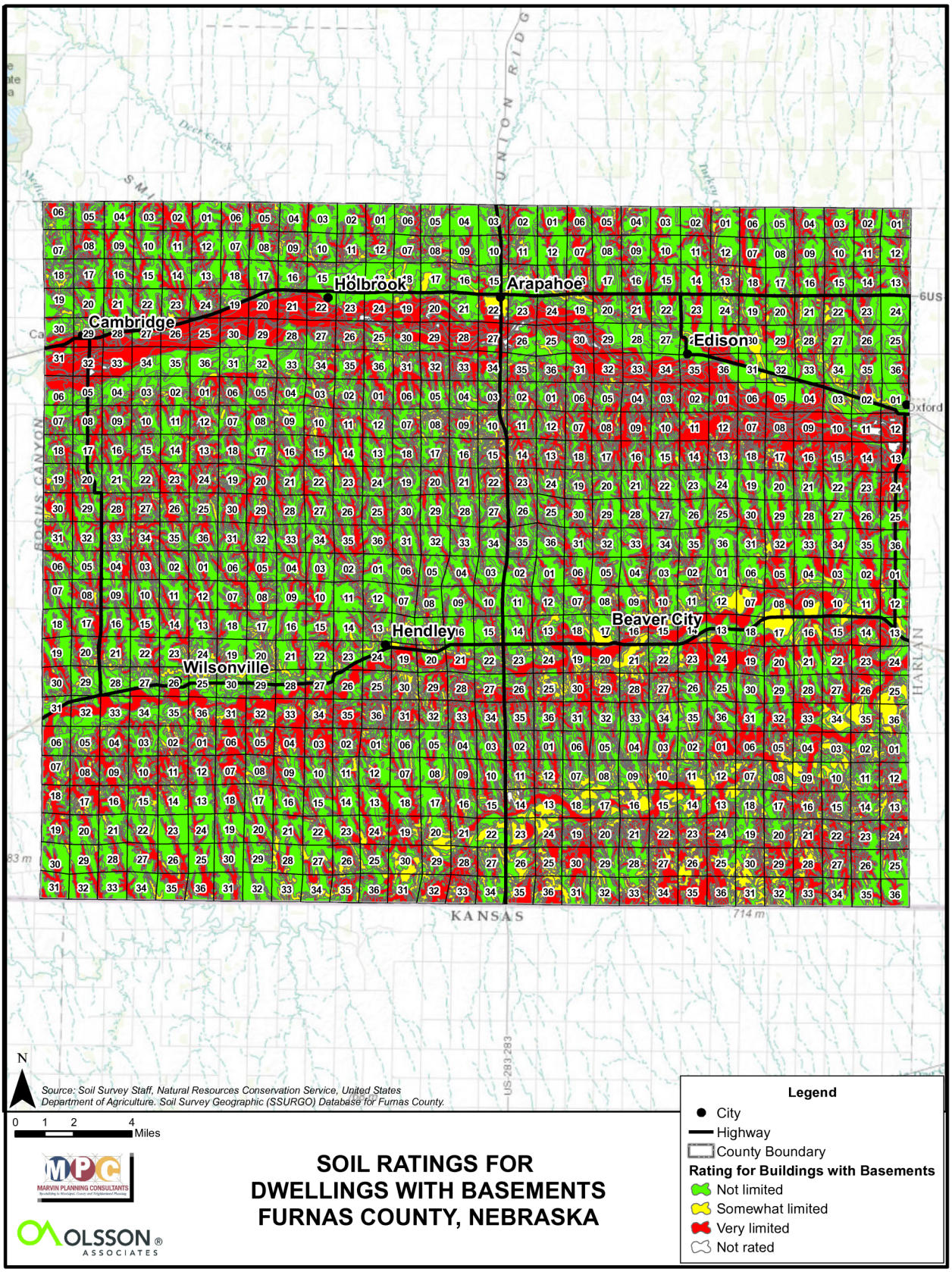
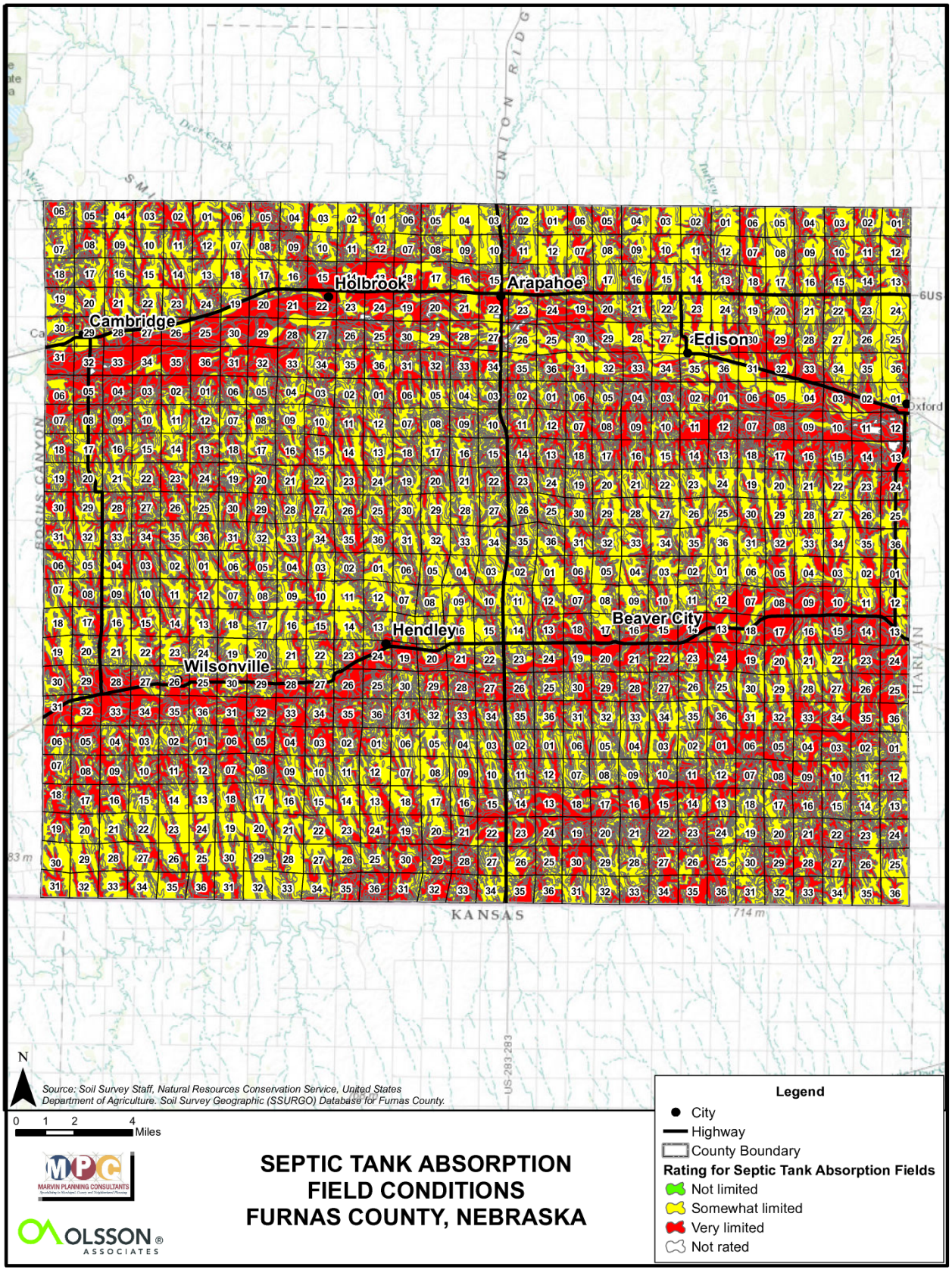


FIGURE 7.12: SEPTIC TANK ABSORBTION



Septic Tank and Absorption Fields

Figure 7.12 shows the soil suitability conditions for placement of a septic tank and absorption field in Furnas County. Table 7.1 provides the suitability by soil types and the specific conditions impacting the soil.

Based upon the Table 7.1, there are no soils rated as no limitations.

The soils rated as somewhat limited are found in 28 different soils. These soils are found throughout Furnas County. The most common limitations needing to be overcome are:

- Slow water movement
- Slope, and
- Flooding

The soils rated as very limited make up the remaining soils and areas of Furnas County. All factors are found throughout the county except for shrink-well. The factors for septic tank and absorption fields are:

- Seepage
- Flooding
- Depth to saturated water
- Filter capacity
- Depth to either soft or hard bedrock
- Slope
- Slow water movement
- Ponding

Conventionally, the septic tank-absorption field system has proven satisfactory for many areas when properly designed, installed, and maintained. However, conditions do exist where this system is not suitable. Areas of seasonal high groundwater tables, bedrock in close proximity to the soil surface, or soils having very fast or very slow percolation rates are not suited for the septic tank-absorption field system. Other limitations for this system include topography, small lot size and proximity to water supplies used for drinking or recreation.

Other Factors Impacting Land Uses

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 7.13 identifies Prime farmland, Farmland of statewide importance, Prime farmland if drained, Prime farmland if irrigated, Prime farmland if irrigated and drained, 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.

Furnas County has prime farmland, but it is scattered throughout the county and is not in large swatches.

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 7.3: DEFINITION OF SOIL SLOPES

Classes Simple Slopes	Slope Gradient Limits	
	Lower Percent	Upper Percent
Nearly level	0	2
Very gently sloping	1	3
Gently sloping	3	6
Strongly sloping	6	9
Moderately sloping	9	15
Steep	15	30
Very Steep	30	60

A large portion of Furnas County has slopes less than 15%; however, there are areas where the slopes are between 16% and 45%.

Permeability

Permeability is defined 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	0.6 to 2.0 inches
Moderately Rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Table 7.2 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 some soils in Furnas County that can see a permeability of 20 inches per hour or more. In addition, there are several that can reach 6 inches per hour which can be a concern.

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.

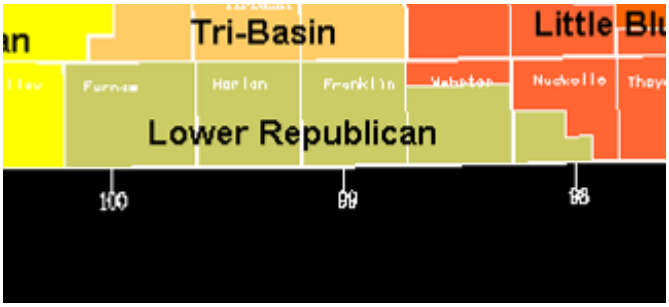
WATER AND ITS IMPACT ON FURNAS COUNTY

Water, along with the soil conditions discussed in this Chapter are the two most restricting environmental conditions faced by Furnas 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 Furnas County during the present and the coming planning period. Water in this section will apply to two different 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 Republican 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.

Furnas County lies within the Republican River watershed. The Natural Resources District assigned to cover Furnas County is the Lower Republican NRD. The Lower Republican NRD is headquartered in Alma.

FIGURE 7.13: WATERSHEDS/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 7.16 indicates where the hydric soils are located in Furnas County. The soils are classified as

the following:

- Hydric (100%),
- Predominately Hydric (66% to 99%)
- Partially Hydric (33% to 65%)
- Predominately non-hydric (1% to 32%)
- Non Hydric (0%)

The majority of the soils in Furnas County are in the non-hydric categories. The majority pf the hydric soils and partially hydric soils are along the Republican River and other major creeks and streams in Furnas County. However, there are smaller patches located throughout the entire county.

Groundwater/Water Table Elevations

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 Furnas County, 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.

Depth to Water

Figure 7.17 indicates the approximate water table/ aquifer elevations. The water table elevation, in Furnas County, varies from 0 feet below grade to over 200 feet below grade. The largest grouping of shallow water lies along the Republican River and Wilsonville; while areas are scattered throughout the county. Furnas County has several areas where it is 200 feet or deeper.

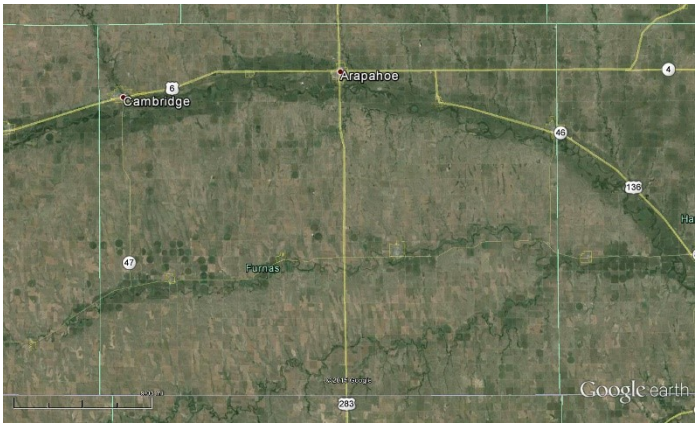
Thickness of Principal Aquifer

Figure 7.18 indicates the thickness of the water table/ aquifer. The thickness ranges from approximately 0 feet in depth to 100 feet in depth depending upon which part of the county ones resides. The deepest portion of the aquifer can be found in the northeast corner and south of Holbrook.

Use of Groundwater

Groundwater use in Furnas County is in three forms, domestic and livestock supply, public water supplies, and irrigation. Each of these uses is important to the overall viability of Furnas County. However, the use of groundwater in Furnas County is greatly restricted by the Lower Republican NRD due to court decision regarding the amount of water that travels in the Republican River from Nebraska to Kansas.

Figure 7.14: Irrigation Activity in Furnas County



Looking closely at Figure 7.14, the aerial indicates smaller patches of green along the Republican River and a couple of other tributaries. These are the areas where the majority of the crop irrigation is within Furnas County. A lot of this may be due to the Republican River issues, as well as a major lack of groundwater availability.

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. Most of these wells are low production wells, 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 Furnas County, all of the incorporated communities have a publicly owned water supply system.

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.

FIGURE 7.15: HYDRIC SOILS

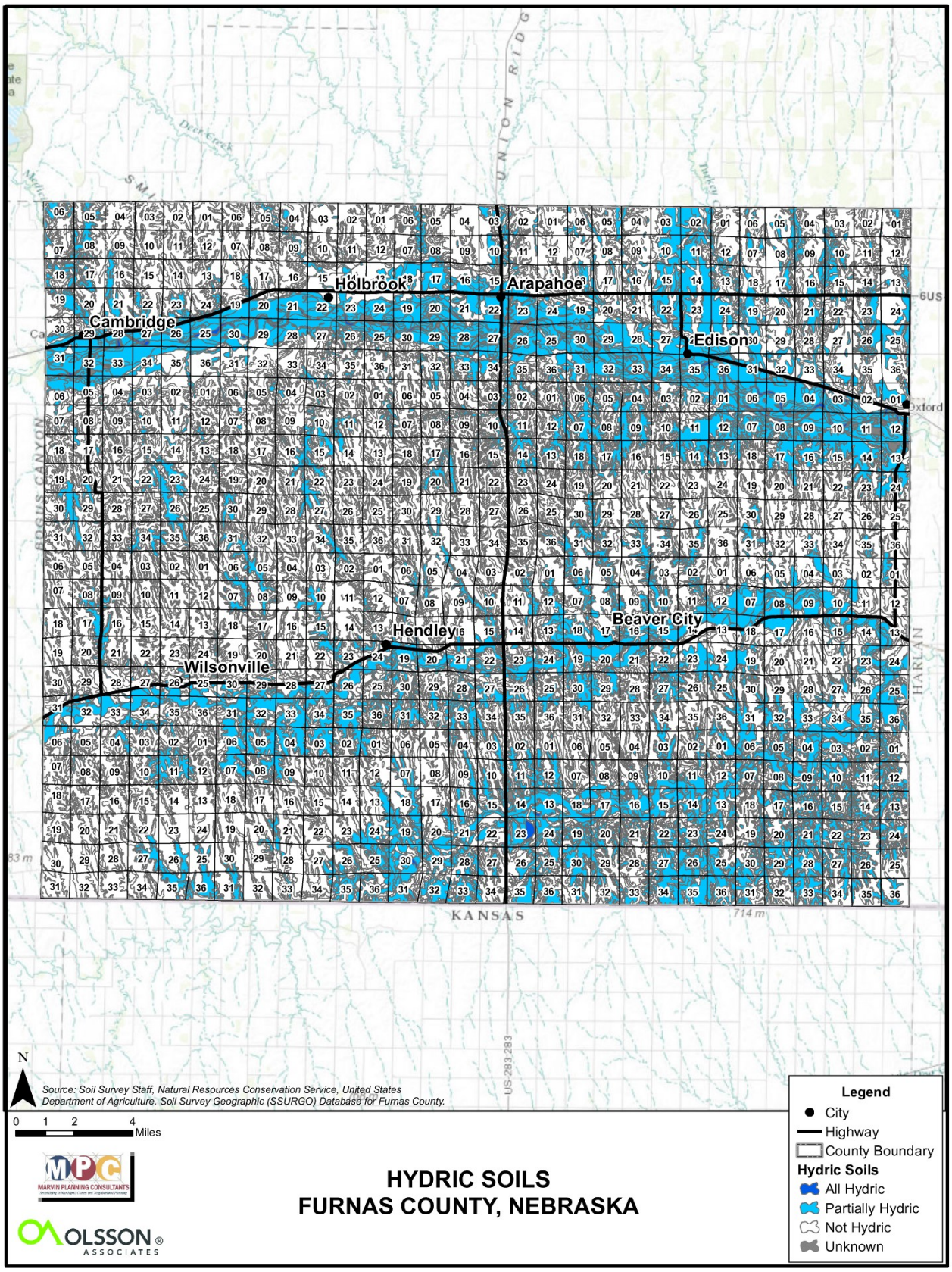


FIGURE 7.16: DEPTH TO WATER

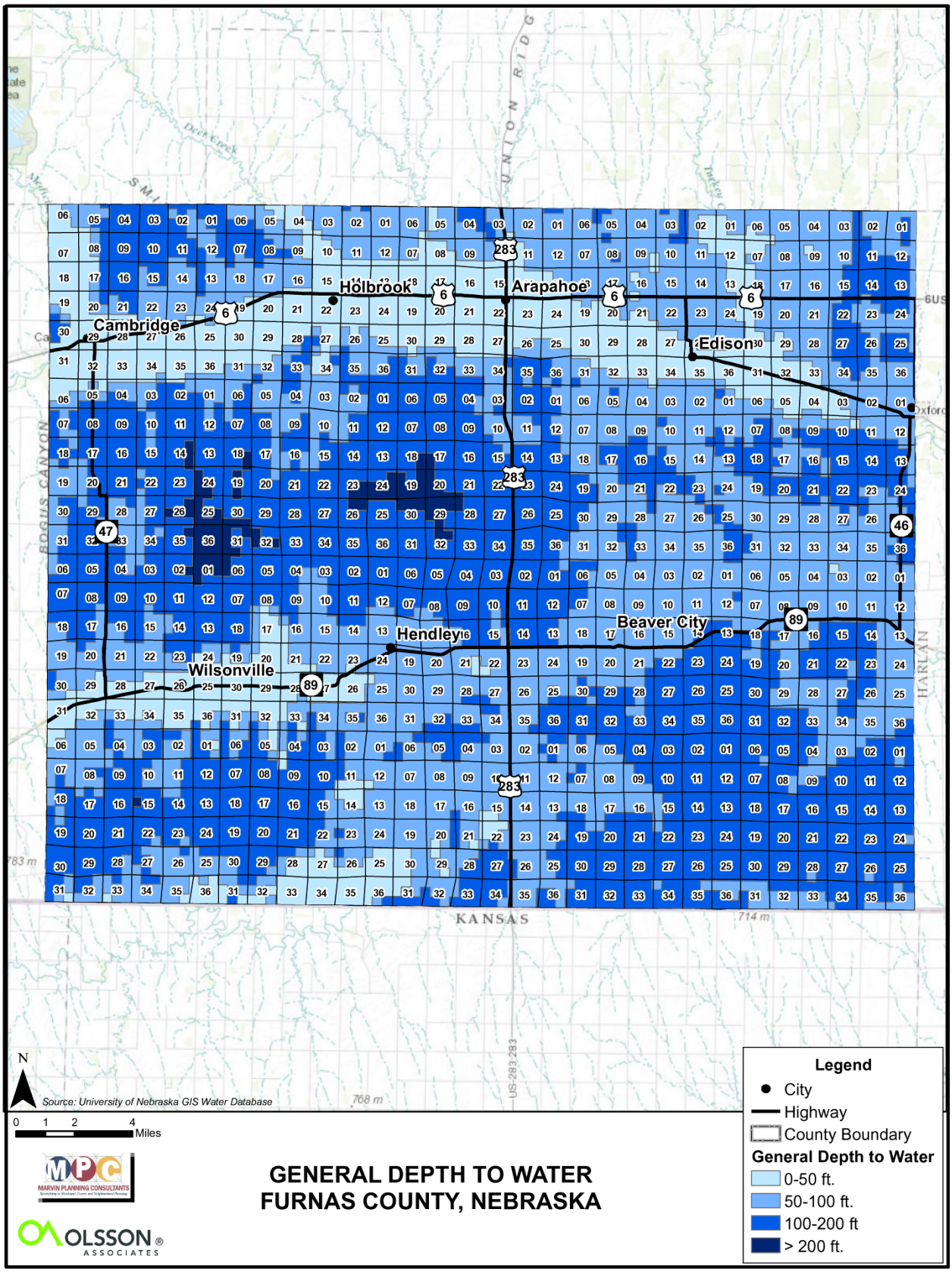
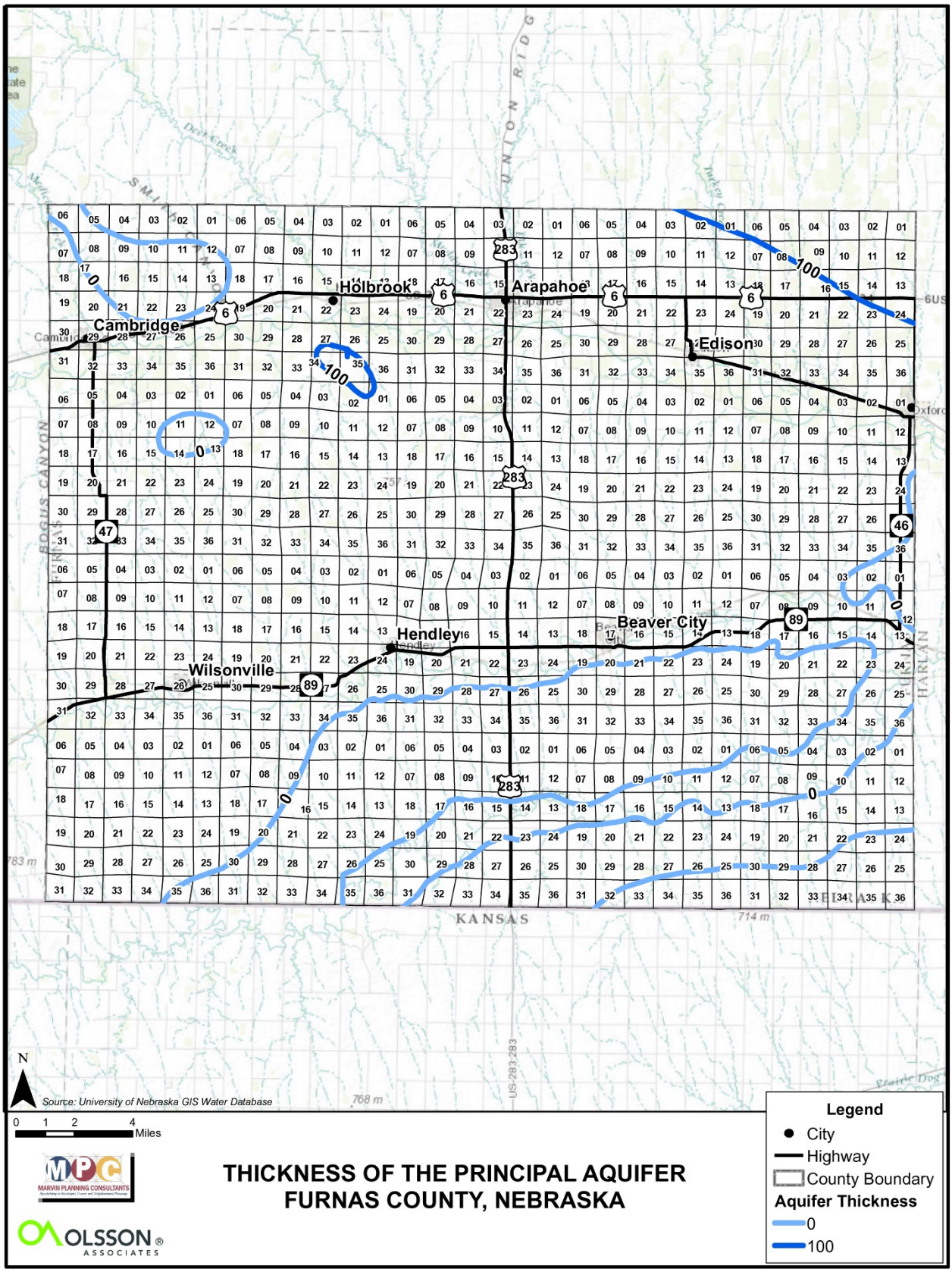


FIGURE 7.17: THICKNESS OF THE PRINCIPAL AQUIFER



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

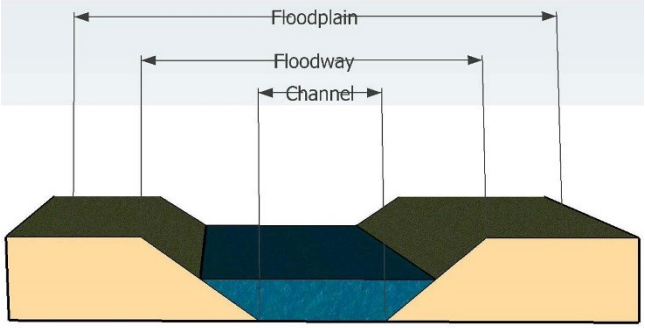
The mapping process includes the use of computer modeling and other data. From this the NDEQ can generate a map indicating the wellhead Protection Area. However, delineating an area is not sufficient for protecting the groundwater around a public supply well; the governmental entity must adopt an ordinance 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 Furnas 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.

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 of a 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 limited 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 its 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 property. In order to protect ones 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.

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

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 29 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.

FIGURE 7.18: WELLHEAD PROTECTION AREA

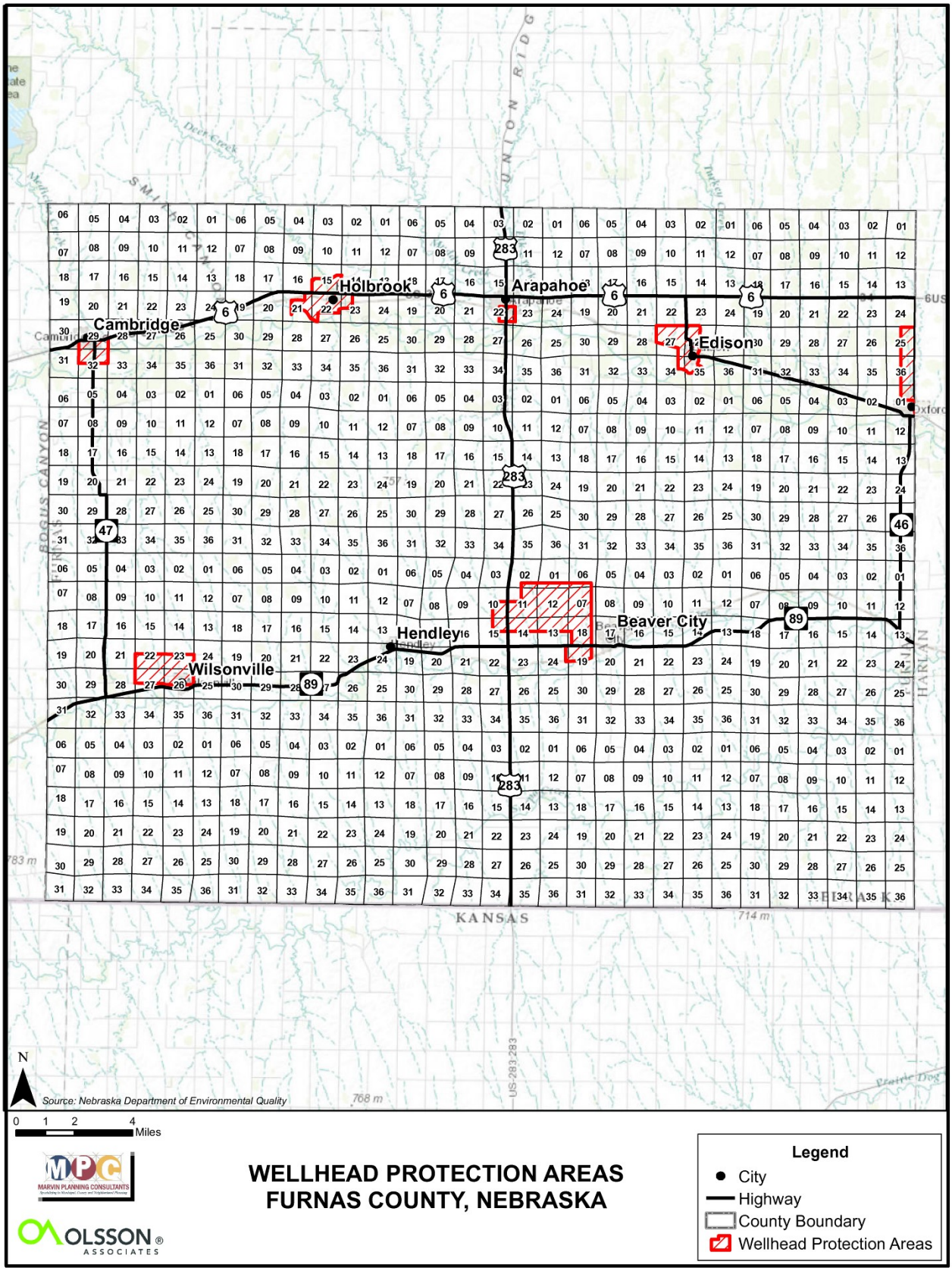


FIGURE 7.19 FLOODPLAIN

Natural Resources/Environment Goals and Policies

Soils

Soil Goal 1

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

Soil Policies and Strategies

Soil-1.1 The County should require individuals and businesses wishing to build in areas with moderate and severe limitations to provide an engineering statement signed by a licensed engineer stating the issues have been considered in the design of the project.

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 Furnas County should discourage land use development within the floodplains of the county.

W-1.5 Furnas County should support soil and water conservation efforts to aid in erosion, sediment, and run-off control.

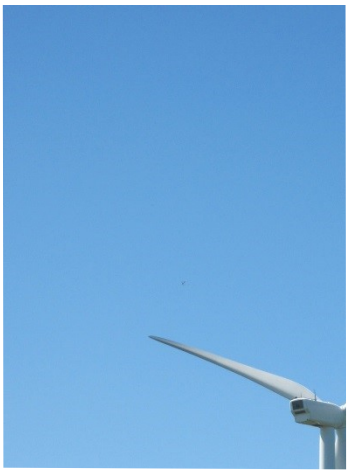
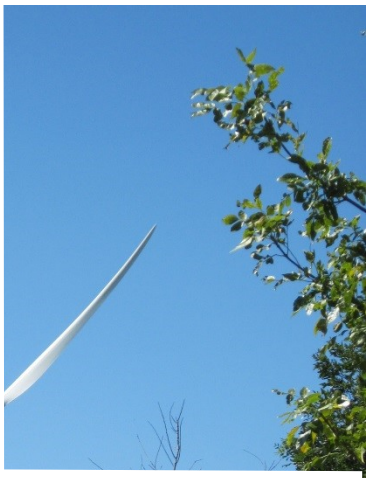
W-1.6 Furnas County should coordinate with and support city, regional, state and federal water -quality plans and programs so that high water quality will be achieved in the cities and villages of the County.

W-1.7 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-1.8 Furnas 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.





8

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
- 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. With this increased concern for the environment came 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 that 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 Furnas 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. The passage of LB 997 appears to be a first step toward comprehensive plans addressing the entire issue of energy conservation and/or sustainability.

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 Brundtland Commission Report in 1987,[1] described sustainability as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs". 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 place in the future.

Americans have grown to rely more heavily on electricity. However, state and federal policies have been increasingly more insistent on curbing this increasing 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.

People question what a county like Furnas County can do to make for a better environment. There are a number of activities that can be undertaken and pursued to make an impact in this small part of Nebraska. The following information will perform at a minimum the requirements of LB 997 but they will also examine strategies a county like Furnas County can undertake to make a contribution to the overall solution.

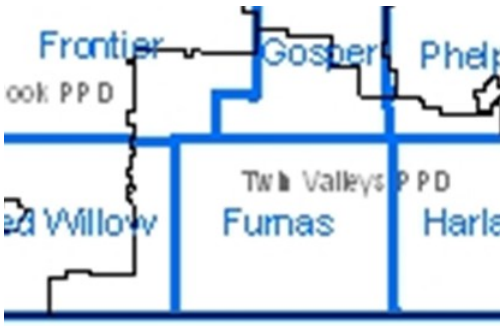
Energy Infrastructure

Electrical Power

Electrical power is supplied by one Public Power District in Furnas County. This entity is:

- Twin Valleys Public Power District.

Figure 8.1: Public Power Districts
Furnas County, Nebraska



Twin

Valleys Public Power District

From the first pole over 60 years ago, Twin Valleys Public Power District has developed into 2,300 miles of energized distribution line serving about 6,600 meters and 184 miles of transmission lines. Twin Valleys Public Power District not only serves farmsteads, irrigation wells, stock pumps, feed lots, and grain storage facilities, but also schools, towns and oil wells. The District serves the villages of Danbury, Lebanon, Ragan, Republican City, Orleans, Stamford, Huntley, Hendley, Edison, and Wilsonville with retail power and sells wholesale power to the villages of Bartley, Holbrook and the City of Cambridge. Power is also delivered to the rest of the communities in the service area over the transmission lines maintained by the District.

Source: http://www.twinvalleysppd.com/about_us.html

Electrical Distribution

The overall distribution system is in good condition and is updated and maintained as needed. The systems are owned and operated by the respective power districts.

Natural Gas Service

Natural gas supplies in Furnas County are typically controlled by Source Gas LLC. Unfortunately, contact numbers and addresses were not located for this energy source. Therefore, there is no data for the system available as well as consumption.

Energy Use by Sector

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

Residential Uses

Within Furnas County, the 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 Furnas 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 urban parts of Furnas 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 available.

Commercial Uses

Furnas 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 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

Furnas 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 counties and even rural areas 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 are a number of 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 to Compact Florescent Lights (CFL) or Light Emitting Diodes (LED).
- 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 more costly 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 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 in 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. Again, property owners 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 a commercial business more energy efficient. Some of the easiest include:

- Converting all incandescent light bulbs to more efficient Florescent Lights, or CFL's or LED's on small fixtures.
- 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 more costly 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 geothermal heating and cooling system.
- New storefronts with insulated panels and insulated Low-E glazing.

Public Strategies

Similar to commercial and industrial uses, strategies for energy efficiency within public facilities can be more difficult to achieve than those in the other uses. 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 strategies that can be undertaken to improve energy efficiency and usage in public facilities similar to commercial and industrial facilities.

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

- Converting all incandescent light bulbs to more efficient Florescent Lights, or CFL's or LED's on small fixtures.
- 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 more costly ways to make the 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 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, the earth (geothermal), and even methane (from natural resources or man-made situations) that can be used over and over again with minimal or no depletion. The most common source of renewable energy used in Nebraska is the wind, the sun, water and earth. The following are examples of how these renewable resources can be used to reduce our dependency on fossil fuels.

Wind

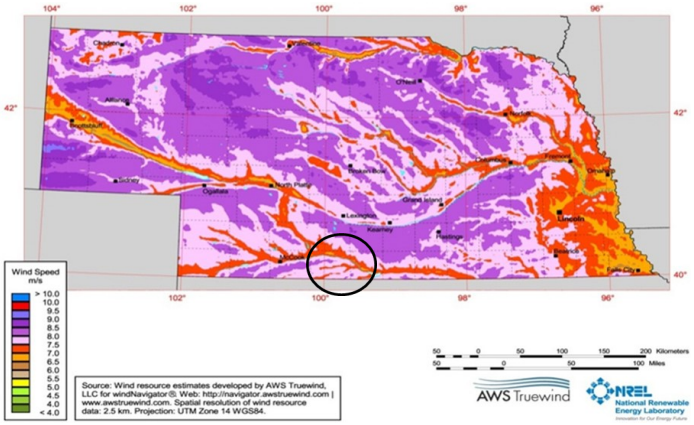
The wind is one of those resources that seem to be in abundance in Nebraska. Wind is not a new technology in Nebraska; the pioneers that settled in Nebraska used wind mills for power and to work the water wells on their farms and ranches.

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.

Wind power has been and still is being examined for the western edge of Nebraska including Furnas County. Studies indicate good wind resources in this region. In addition, companies such as Florida Power and Light have had success in converting wind into electricity from their wind farms in eastern Colorado.

Figure 8.2 indicates Furnas County has good wind potential throughout the county. The western edge appears to be better suited for wind turbines.

Figure 8.2: Annual Average Wind Speed at 80 Meters



Source: AWS Truewind

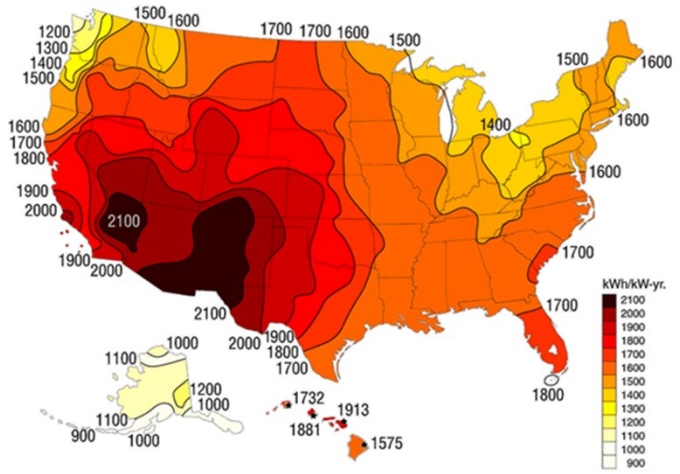
Solar

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 are more 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 coat 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 8.3: SOLAR CONTOURS



Source: Solar Energy Industries Association

Geothermal Energy

Geothermal energy includes 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 call a geothermal heat exchange system or ground source heat pumps. 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 within the rural areas of Nebraska. Methane electrical generation can be accomplished through the use of a methane digester which takes the raw gas, naturally generate from some form of waste material, and converts the gas into electrical power.

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.

In addition to converting methane into electricity, it can also provide a source of power by replacing natural gas as a heating source.

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 the local public power districts.

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.

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; or
- a tribal council.

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/Renewable Energy Policies

Local governments need to take steps to encourage greater participation in wind generation. Cities and counties can do a number of items to make these projects more attractive. Some of the things that could be done are:

- 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; provide, they meet all building codes and manufacturers requirements for attachment.
- Work with the NPPD 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 (Bill 140) to include wind. Counties and municipalities are permitted to develop zoning regulations, ordinances, 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 NPPD 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 in Lincoln.

Please consult local public power districts and/or NPPD to see what incentive are available.

Energy Goals and Policies

Energy Goal 1

Furnas County will work to become more energy efficient during the planning period.

Policies and Strategies

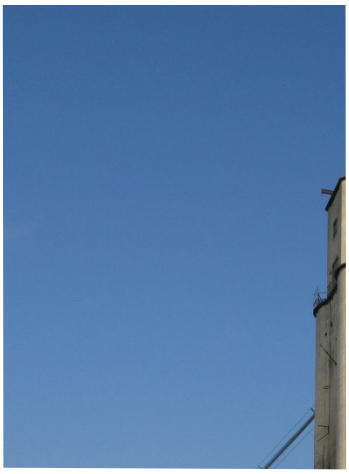
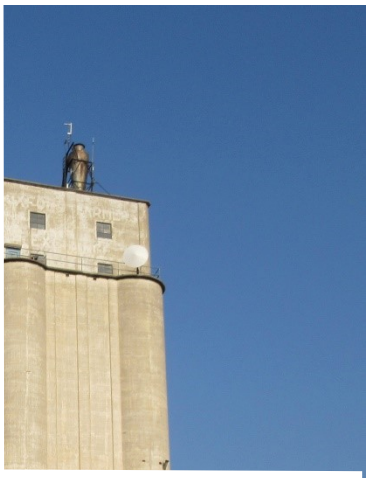
ENG-1.1 The County in conjunction with the local public power districts should continually promote the use of energy reducing CFL or LED bulbs within the county.

ENG-1.2 The County should adopt zoning regulations allowing the use of solar and personalized wind turbines.

ENG-1.3 The County should adopt regulations encouraging the use of methane digesters in feeding operations.

ENG-1.4 The County should promote more energy efficient construction practices within the County.

ENG-1.5 The County should develop standards allowing for the use of geothermal heating and cooling systems for different uses.



9

Land Use Plan




Introduction

The Furnas County Land Use Plan provides 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 Furnas County. This Chapter reflects the existing conditions and should be flexible in order to meet the needs of its citizens as well as their vision for the community's future.

The Furnas County Land Use Plan 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 Plan should promote improvements in all the components of the local economy.

Furnas County Land Use Elements

The elements of the Furnas County Land Use Plan includes:

- Existing Land Use, 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 during the course of the planning period.

Overall, development patterns in and around Furnas County have been influenced by topography, water, soils and manmade features such as three Nebraska highways and three U.S. Highways. 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/residential uses
- Commercial uses
- Quasi-Public/Public (includes churches and schools)
- Livestock facilities
- 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. Furnas County is an agricultural based county and the existing land use map verifies these uses.

Livestock facilities– These are specific confinement buildings including swine houses, cattle, and open lots.

Residential– This category includes residential dwellings either as a farmstead, acreage or residential developments located within the county. Residential units of this type are distributed throughout the County.

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 urban areas or in proximity to major highways for accessibility.

Industrial/Railroad Right-of-Way - Land uses of this nature may include communication plants, light 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 Merrick 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 Furnas County has a variety of different environmentally sensitive landscapes. The county a variety of environments including:

- Republican River valley
- Cropland
- Prairie
- Valleys
- Rolling hills

Future Land Use Plan

The Future Land Use Plan provides the basis for the formulation of land use policy and 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 Future Land Use Plan should promote improvements in all components of the local economy. The following common principles and land use concepts have been formed to guide future development and redevelopment activities within Furnas County's planning and zoning jurisdiction.

The plan is based upon existing conditions and projected future conditions for the county. The Land Use Plan also assists the county in determining the type, direction and timing of future growth and development activities. 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 of growth
- 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 improvement budget. This Plan acknowledges these factors play an important role in the growth and development of Furnas County. A Future Land Use Plan is intended to be a general guide to future land uses that balance private sector development (the critical growth element in any county) with the concerns, interests, and demands of the overall local economy.

Land Use Categories

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

- Primary Agricultural
- Transitional Agricultural
- River Protection Corridor
- Commercial Corridor (overlay)
- Wellhead Protection Area (overlay)
- Floodplain (overlay)

Primary Agriculture

General Purpose

This land use 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.

Within the County's Zoning Regulations, it is suggested smaller livestock facilities, up to 1,000 animal units 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.

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. Manure/fertilizer applications
6. Public recreational, wildlife and historical areas
7. Renewable energy equipment
8. Tourism activities such as: hunting preserves, fishing, vineyards etc.
9. Religious uses and structures
10. Educational uses and structures
11. Community/Recreational Center
12. Larger park and recreation areas

Incompatible Uses

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

Potential issues to consider

1. Slopes
2. Topography
3. Natural amenities such as trees, ponds, and streams
4. Site drainage
5. Flooding hazards.
6. Groundwater availability
7. Groundwater contamination
8. Minimum lot sizes and residential densities
9. Wetlands
10. Existing and/or proposed sanitary system
11. Potable well locations
12. Wellhead protection areas

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 2 dwelling units per 1/4 section.
3. Cluster developments should be considered and used whenever soils, topography, natural amenities warrant.

Transitional Agriculture

General Purpose

The Transitional Agriculture represents an area in the County where agriculture is protected, but limited. The location of these land use areas are near jurisdictional intersections of the larger communities of Merrick County. The district is generally located 1/2 mile around the extraterritorial jurisdictions of the communities with planning and zoning. In addition, there will be a 1/2 mile band around the communities without any planning and zoning.

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. Private and commercial grain storage
4. Manure/fertilizer applications
5. Public recreational, wildlife and historical areas
6. Renewable energy equipment
7. Tourism activities such as: hunting preserves, fishing etc.
8. Religious uses and structures
9. Educational uses and structures
10. Community/Recreational Center
11. Larger park and recreation areas

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 300 animal units
3. Large commercial developments

Potential issues to consider

1. Slopes
2. Proximity to existing livestock facilities
3. Topography
4. Natural amenities such as trees, ponds, and streams
5. Site drainage
6. Flooding hazards.
7. Groundwater availability
8. Groundwater contamination
9. Wetlands
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 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 area follows the Republican River and 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.

Residential development, limited agricultural uses, sand and gravel and similar mining as well as recreation will be the primary uses in this land use. It is suggested, if these areas are further developed, trails and designated open spaces should be considered to provide for increased recreational opportunities in the County. However, no new construction will be allowed in any 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. Public recreational, wildlife and historical areas
5. Tourism activities such as: parks, hunting preserves, fishing etc.
6. Religious uses and structures
7. Educational uses and structures
8. Community/Recreational Center
9. Larger park and recreation areas

Incompatible Uses

1. Confined 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. Floodway
2. Floodplain and flooding hazard
3. Proximity to existing livestock facilities
4. Wetlands
5. Depth to groundwater
6. Topography
7. Natural amenities such as trees, ponds, and streams
8. Site drainage
9. Groundwater contamination
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 no more than 2 dwelling units per 1/4 section; except when a sandpit development is proposed.
3. Cluster developments should be considered and used whenever soils, topography, natural amenities warrant.

Commercial Corridor (Overlay)

General Purpose

The Commercial Corridor land use provides for larger commercial development along major transportation routes when specific conditions prove favorable. This land use category is established as an overlay in order to allow commercial uses without specifically changing the classification of the primary district. This land use is to promote the agricultural industry of Furnas 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

Incompatible Uses

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

Potential issues to consider

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

FIGURE 9.1: EXISTING LAND USE MAP

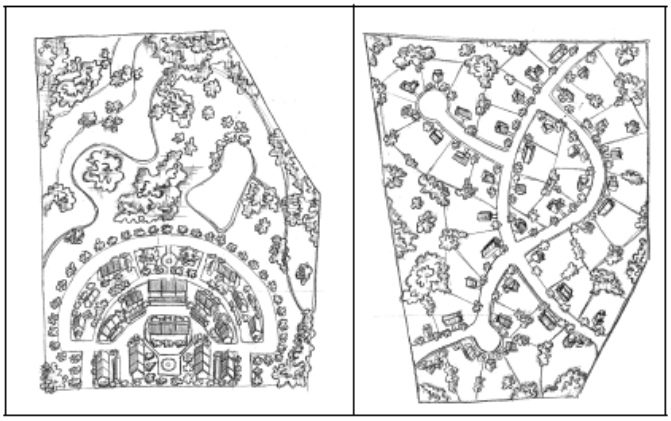
FIGURE 9.2: FUTURE LAND USE MAP

Conservation Subdivisions

The graphic above represents a standard subdivision and how it can be redrawn into a conservation subdivision. The primary usage of this technique in Furnas 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
- Natural prairie

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. 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.



Conservation subdivisions (left) feature smaller lots with a high percentage of open space. Conventional subdivisions (right) feature large lots with little common open space. A conventional subdivision is subject to all of the base zoning district standards, such as minimum lot size, front setbacks, landscaping, and adequacy of public facilities.

Future Land Use Goals

Land Use Goal and Objectives

Guiding future growth and development in Furnas 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, rivers, and groundwater.

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

GENLU-1.3 The County should minimize leapfrog development beyond the extraterritorial jurisdictions of the communities in Furnas County.

GENLU-1.4 The Furnas County Land Use Plan and Zoning Regulations should be designed to expedite the review and approval process where possible.

GENLU-1.5 All land uses and structures should be carefully reviewed for compliance with the duly adopted floodplain and floodway regulations in Furnas County.

Agricultural Land Use Policies and Strategies

AGLU-2.1 Livestock production should be encouraged in Furnas County provided environmental conditions are appropriate.

AGLU-2.2 Livestock production should be protected from the establishment of conflicting uses such as acreages.

AGLU-2.3 New livestock operations should be located in areas where their impact on neighboring land uses will be minimal.

AGLU-2.4 Furnas County should allow agricultural production throughout the county; except where there may be potential conflicts with other policies of this plan.

AGLU-2.5 Livestock operations should be encouraged to utilize odor reducing technologies such as methane digestion and composting .

AGLU-2.6 Establish adequate separation distances between livestock and residential uses.

AGLU-2.7 Establish adequate separation distances between residences and livestock operations that allow for potential expansion of livestock operations.

AGLU-2.8 Non-agricultural development within agricultural areas should be allowed only in specifically designated areas where the impact on agriculture is minimal.

AGLU-2.9 Non-agricultural development within the county may be limited based upon certain soil and environmental conditions.

AGLU-2.10 Furnas County should minimize encroachment of non-agricultural uses into areas designated as "Prime Farmland". Special consideration for

preserving these areas through special land use controls and practices should assist in protecting these lands for traditional agricultural purposes.

AGLU-2.11 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-2.12 Protect the quality of groundwater in agricultural areas of Furnas County.

AGLU-2.13 Work with livestock producers on a continual basis in evaluating protections and regulations.

River Protection Corridor Land Use Policies and Strategies

RPCLU-3.1 The River Protection Corridor should be protected due to the nature of the soils in the area and the occasional flooding occurring in the area.

RPCLU-3.2 The County should not allow the introduction of new confined livestock operations into the River Protection Corridor, especially in any designated floodway.

RPCLU-3.3 The establishment of chemical storage facilities including the manufacturing of chemicals should not be allowed in this area.

RPCLU-3.4 Existing uses within the River Protection Corridor that have a high contaminate potential should be relocated to a more suitable location when possible.

RPCLU-3.5 The County should promote the recreational potential of the area and work with existing property owners to establish specific eco-tourism opportunities.

Residential Land Use Policies and Strategies

RESLU-4.1 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-4.2 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-4.3 Develop subdivision regulations that provide for a quality living environment while avoiding inefficient and expensive public infrastructure expansions.

RESLU-4.4 Any future residential developments should include a subdivision agreement, which provides for the maintenance of common areas, easements, groundwater, use of plant materials and drainage.

RESLU-4.5 Encourage new residential developments to locate near urban areas of Furnas County, especially when direct access to existing, hard-surfaced roads or highways can be accomplished.

RESLU-4.6 Establish zoning and subdivision design standards that require buffers, and screening standards and functional usable green space, for new developments.

RESLU-4.7 Examine implementation of a planned unit development (PUD) concept which provides a viable alternative to conventional urban development patterns, while providing a means to encourage creative yet responsible/ sensitive developments.

RESLU-4.8 New residential construction or relocations should not be allowed along any minimum maintenance road.

Commercial Land Use Policies and Strategies

COMLU-5.1 Encourage the location of commercial uses to locate within the communities of Furnas County.

COMLU-5.2 Encourage the location and clustering of commercial uses within the rural areas of Furnas County along the designated Commercial Corridors.

COMLU-5.3 Utilize frontage roads within clustered commercial centers when locating along major roads/highways.

COMLU-5.4 Commercial uses should be required to provide their own adequate water supply without negatively impacting existing neighboring properties.

Industrial Land Use Policies and Strategies

INDLU-6.1 Encourage the location of industrial uses to locate within the communities of Furnas County.

INDLU-6.2 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-6.3 Industrial uses should be located so an adequate buffer space is provided between incompatible land uses.

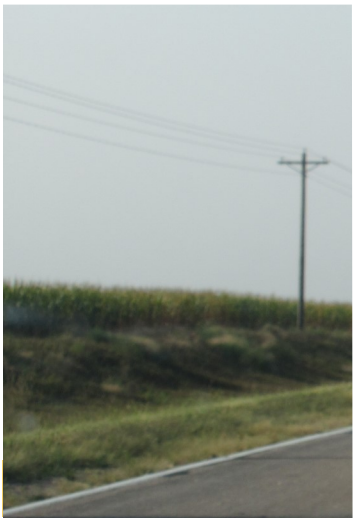
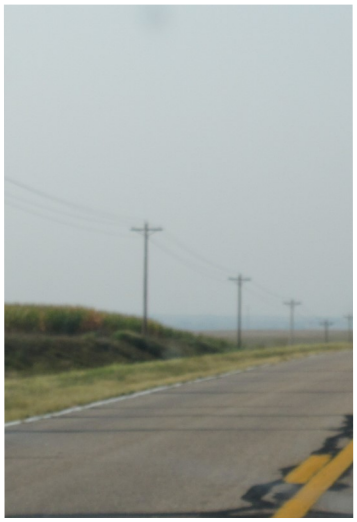
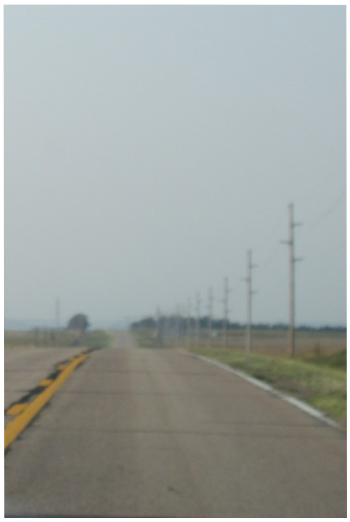
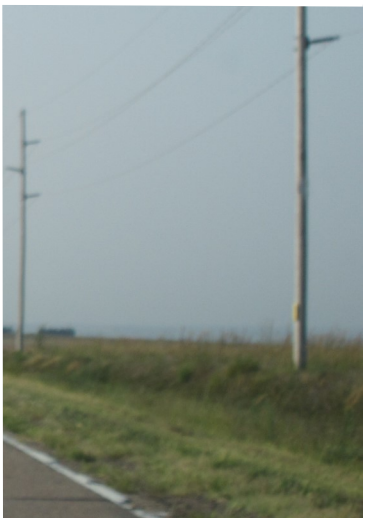
INDLU-6.4 The County should develop appropriate performance, design and specification standards and requirements for all existing and future industrial uses to guide their location or relocation in the County.

INDLU-6.5 The County should recognize and encourage small-scale industries as viable alternatives to larger, conventional enterprises.




10

Transportation Plan

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 Furnas 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 Furnas County.

Railroad Service

The closest rail freight service to Furnas County is in McCook with regard to the Burlington Northern Santa Fe Railroad and Lexington and Grand Island for the union Pacific Railroad. The nearest passenger service is located in McCook through Amtrak.

Bus Service

The nearest commercial bus service with ticketing services is available in Lexington via Black Hills Stage Lines and Burlington Trailways.

Commercial Airport Service

Kearney Regional Airport (EAR) is the closest commercial airport to Furnas County. EAR has service provided by Great Lakes Airlines with a direct connection to Denver International Airport. Besides EAR, Central Nebraska Regional Airport in Grand Island provides service to Central Nebraska. Currently, the airport and commercial service connects people to Phoenix and Las Vegas through Allegiant Airlines and points across the U.S. through Dallas-Ft. Worth via American Airlines.

Small craft Public Airports

Within Furnas County there are two small aircraft airports, one in Cambridge and one in Arapahoe.
Cambridge airport has two runways with 14/32 being the primary runway. Runway 14/32 is 4098 feet x 60 feet and is paved with asphalt. The crosswind runway is a sod runway. Elevation is listed at 2413.2 feet.

The Arapahoe airport has a single runway, 15/33 Runway 15/33 is 3000 feet x 50 feet and is paved with asphalt. Elevation is listed at 2273 feet.

State and Federal Highways

Furnas County has three federal highways running through the county and three state highways. The major north-south highways are US Highway 283 and Nebraska Highways 46 and 47 and the east-west connections are US Highway 6/34 and 136 and Nebraska Highway 89.

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 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)

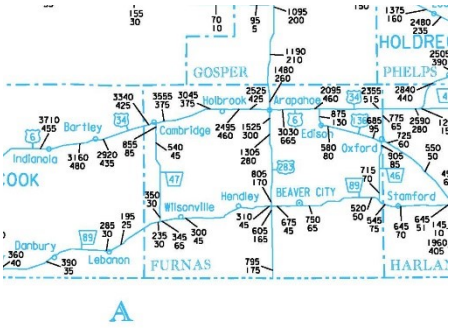
Nebraska Highway Law (Chapter 39, Article 21, Revised Reissue Statutes of Nebraska 1943) proposes the functional classification of both rural and municipal roads and streets and public highways. Chapter 39, Article 21.03 lists rural highway classifications as:

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 Furnas County

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

FIGURE 9.1:
TRAFFIC FLOW MAP



Source: Nebraska Department of Roads

Figure 9.1 indicates the greatest traffic flows are between Holbrook and Cambridge along US highway 6/34 with over 3,500 cars and 375 trucks per day. The second greatest traffic flow is between Arapahoe and US Highway 136 with over 3,000 cars and 665 trucks per day. US Highway 6/34 sees significant increases as it goes toward McCook and Holdrege. All of the other highways have significantly less traffic than US highway 6/34.

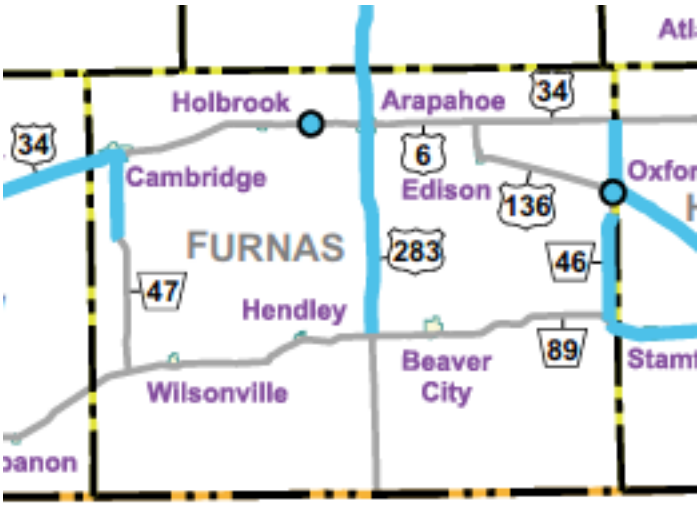
Nebraska Department of Roads' Improvements

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 present, and six years and beyond. Furnas County is in the Department of Road's District 7. Between Fiscal Years 2016 and 2021, there are six projects budgeted for the Furnas County area, all of which will fall between 2017 and 2021. These projects include:

- US Highway 6, Holbrook east - Bridge
- Nebraska Highway 46, Oxford south - 6.3 miles grading, culverts, surface, resurfacing
- Nebraska Highway 46, Oxford north - 4.0 miles grading, culverts, resurfacing
- Nebraska Highway 47, Cambridge south - 5.4 miles resurfacing
- US highway 283, Arapahoe south - 11.5 miles resurfacing, bridge repair
- US highway 283, Arapahoe north - 10.7 miles resurfacing, bridge repair

Overall the Nebraska Department of Roads is expecting to spend nearly $21,000,000 in repairs and upgrades in the Furnas County over the next six years.

FIGURE 9.2:
NDOR SIX-YEAR HIGHWAY PROGRAM



Source: Nebraska Department of Roads

TRANSPORTATION GOALS

Transportation Goal 1

The transportation goal of Furnas County is to develop and support an efficient road system to serve current and future circulation and access needs.

Transportation Policies and Strategies

TRAN-1.1 Development in Furnas County should be guided to safely utilize existing public investment in roads, and programs to reduce road development or maintenance costs.

TRAN-1.2 New development should be reviewed with due consideration to the carrying capacity of the existing road system in the area.

TRAN-1.3 Development should be discouraged from occurring in areas where the road system is insufficient to handle any additional traffic load.

TRAN-1.4 Land use policies should work strongly with existing and proposed transportation systems and upgrades.

TRAN-1.5 Furnas 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"

FIGURE 9.3:
TRANSPORTATION PLAN MAP





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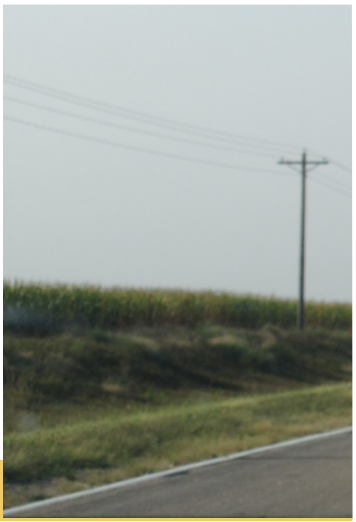
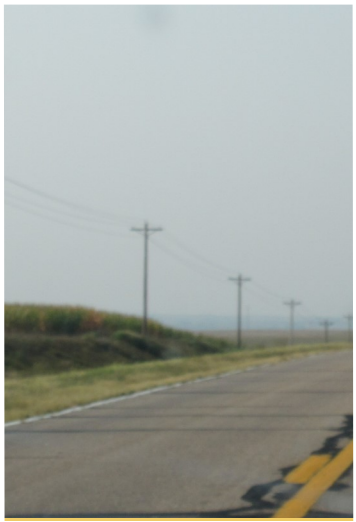
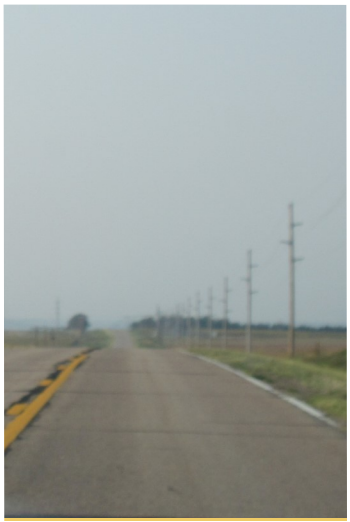
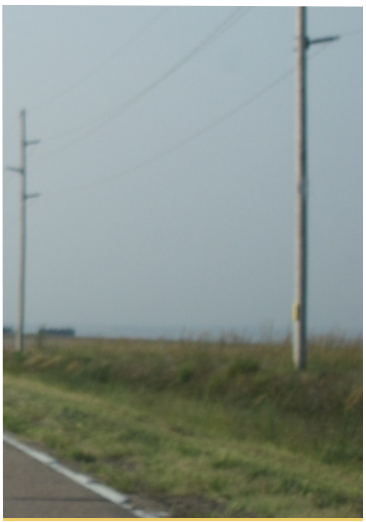
Implementation

Achieving Furnas County's Future

Successful community 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 Furnas County.

Support Programs for the Action Agenda

Three programs will play a vital role in the success of Furnas 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.

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 by 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:

- 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 that 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