

2.7

NATURAL AND ENVIRONMENTAL CONDITIONS

Soils and Watersheds

The Natural and Environmental Conditions section contains pertinent information in the decision making process. The current conditions and constraints lay the foundation for future growth for Springfield. The subsections include Soils, Watersheds, Floodplain, Wellhead Protection Areas, and Hazard Mitigation Planning.

Soils

The Springfield extraterritorial jurisdiction (ETJ) soil has Prime Farmland, Farmland of Statewide Importance, and Not Prime Farmland. Springfield's Prime Farmland in the surrounding area has an overwhelming majority of Marshall-Contrary or Judson soils with two to seven percent slope. There are more acres of Farmland of Statewide Importance in the ETJ and surrounding area with Contrary-Marshall soil between 6 to 11 percent slope. The difference between the two classifications, besides the changes in composition, is related to slope and the associated erosion issues that occur during rainfall events. Agricultural techniques, such as terracing, help to alleviate the natural deficiencies of the associated soils to become as productive as Prime Farmland. The marginal soils deemed Not Prime Farmland related to soil along waterways and flood prone land.

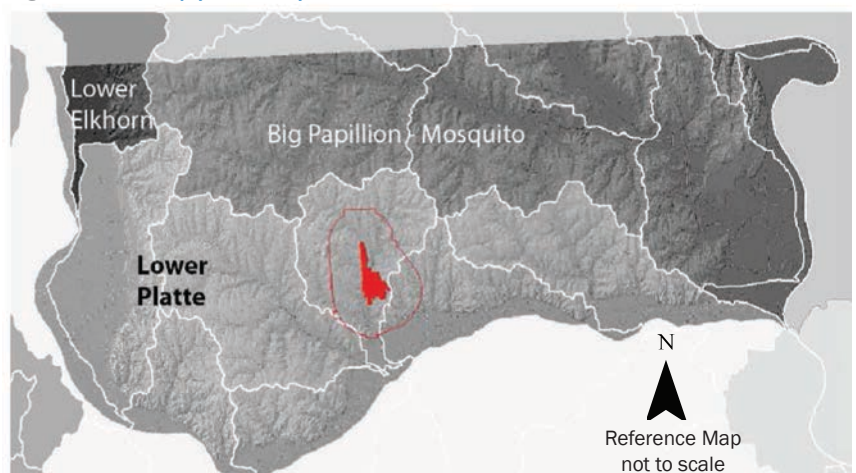
Watersheds

A watershed is an area of land that drains water toward a downhill point. The higher elevation points create boundaries, or ridgelines, that separate one watershed from another. For example, the City of Springfield and its Extraterritorial Jurisdiction (ETJ) fall within the Lower Platte watershed, meaning that its downhill point is the Platte River. The city and its ETJ is also involved in three sub watersheds that, although all drain to the Platte River, with three separate drainage points. The movement of water is directed by gravity and therefore can easily be an opportunity.

HUC 8

Sarpy County has three, larger regional watersheds. These watersheds are identified by United States Geological Survey and classified as Hydrologic Unit Code (HUC) 8 watersheds, or HUC 8. The Lower Elkhorn is located in the northwest corner of Sarpy County and drains to the Elkhorn River before ultimately draining into Platte River. The Lower Platte watershed drains the southwestern and southern half of Sarpy County and ultimately draining to the Missouri River. The Big Papillion-Mosquito drains the northern half and eastern portions of Sarpy County and drains into Papio and Big Papillion Creeks before draining into the Missouri River. The natural drainage ridgeline that divides the three Sarpy watersheds poses difficult infrastructure decisions in regards to future Sarpy County development.

Figure 33 Sarpy County HUC 8 Watersheds



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Local Watersheds

Commercial development has occurred along Highway 370 near 144th Street which is located within the Big Papillion-Mosquito watershed which naturally drains to the north and ultimately east. Metropolitan Utilities District (MUD) can currently provide water and natural gas to this area and the sanitary sewer services are connected to the City of Omaha's Papio treatment plant. If the industrial and commercial development continues south along Highway 50, these necessary services with the proper infrastructure will need to be planned. The drainage changes roughly south of Schram Road and is directed toward the City of Springfield. At the time of the comprehensive plan, there was no infrastructure in place along the highway to provide similar services available north of the ridgeline. A sewer study will be conducted for Sarpy County in 2015.

Development Implications and Municipal Fiscal Decisions

Although Springfield looks forward to development, the daunting infrastructure decisions and resulting costs will be important during this planning period. Springfield has the benefit to support potential new development from the northwest and northeast because the location and capacity potential of its treatment plant. The surface drains or funnels toward Springfield, which has been prepared with expansion in mind, and the treatment plant can more than double in size. As development of the surrounding area occurs, financial compensation to the city for extending services to such development will become vital to its success.

HUC 12 - Springfield's Adjacent Watersheds

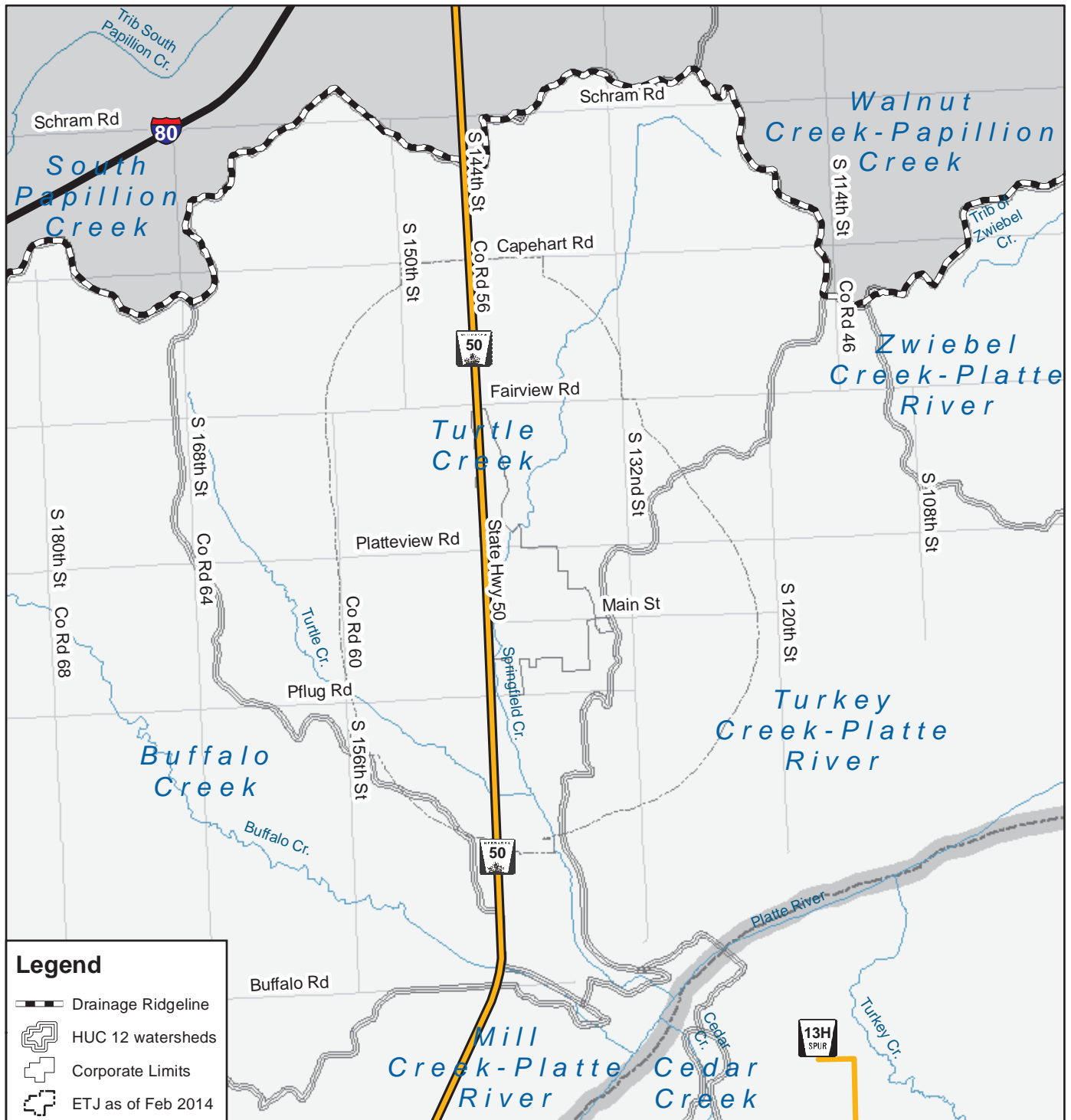
The same classifications from the United States Geology Survey produced additional smaller watersheds within the larger, defined drainage areas. As Hydrologic Unit Code 8 (HUC 8) identifies that Springfield's surrounding area drains to the Platte River, the HUC 12 classifications further identifies the locations of drainage points, in Springfield's case, along the Platte River.

Turtle Creek Subwatershed: The larger countywide drainage ridgeline is the northern boundary along Schram Road. The northwest boundary is roughly 168th and the northeast corner near 114th and Capehart Road. The surface water runoff drains or funnels to the City of Springfield via Springfield Creek or Turtle Creek. The drainage of Turtle Creek runs south of the corporate limits.

Buffalo Creek Watershed: This watershed is located west and southwest of Springfield's corporate limits. This large watershed drains portions of Gretna's corporate limits, south to Hwy 31 and Pflug Road, and as far south as roughly 192nd and Buffalo Road. The Buffalo Creek watershed drains to the southeast toward Highway 50 and into the Platte River. In regards to Springfield's extraterritorial jurisdiction and future development possibilities, the eastern edge runs along 168th Street between Capehart Road and Pflug Road before the higher elevation moves southeast between Turtle Creek and Buffalo Creek.

Turkey Creek - Platte River Watershed: This watershed is located on the eastern edge of Springfield's corporate limits near 132nd and Platteview Road and southeast near 138th Street and Pflug Road. The watershed drains south and southeast to the Platte River. Without the natural gravity flow toward Springfield's existing infrastructure, investment would be needed for the City of Springfield to serve this area.

Figure 34 Springfield Area HUC 12 Watersheds



Hydrologic Unit Code 12

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Floodplain

The City of Springfield's floodplain derives from the Springfield Creek. A Floodplain includes the floodway, one percent annual chance of flooding event, and 0.2 percent annual chance of flooding event. Through Federal Emergency Management Agency's (FEMA) Flood Hazard Mapping Program, Risk Mapping, Assessment and Planning (MAP), FEMA identifies flood hazards, assesses flood risks, and partners with states and communities to provide accurate flood hazard and risk data to guide them to mitigation actions.

Floodway

As the Floodplain Map shows (Figure 36), the floodway of Springfield Creek is not exactly the boundary of the creek. As Federal Emergency Management Agency (FEMA) defines, a floodway is not only the existing water channel but also "other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations."

1% Annual Chance of Flooding

The one percent chance of annual flooding is commonly known as the "100-year floodplain." This description is mistakenly taken that if a flooding event occurred recently than it is not likely to happen again "for a hundred years." That is not the case; each year there is a one percent chance of flooding to the floodplain boundary.

According to the Papio-Missouri River Natural Resources District's Hazard Mitigation Plan, Springfield Creek floods as a result of intense rainfall. The most current flooding occurred in 1959, 1964, and 1965 with the largest event happening on June 16th and 17th, 1964. This event overtopped State Highway 50, several residences, and the Sarpy County Fairgrounds. Previous to these recorded events, the Springfield Creek experienced a major flooding in 1903 and was widely reported. These flooding events can happen back to back years, as they did in 1964 and 1965, or one within over a hundred years; it's simply an annual probability.

0.2% Annual Chance of Flooding

Likewise, two-tenth of one percent chance of annual flooding is commonly known as the "500-year floodplain." This description is also mistakenly taken that if a flooding event occurred recently than it is not likely to happen again "in my lifetime." That is not case; each year there is an equal amount of chance, two-tenth of one percent, of flooding to the "500-year" floodplain boundary depicted in Figure 36.

Figure 35 Floodplain Diagram

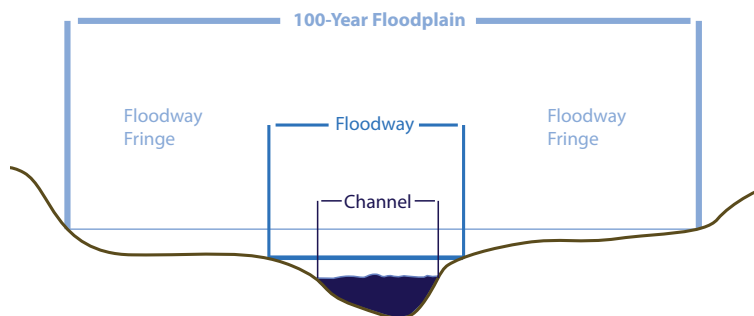
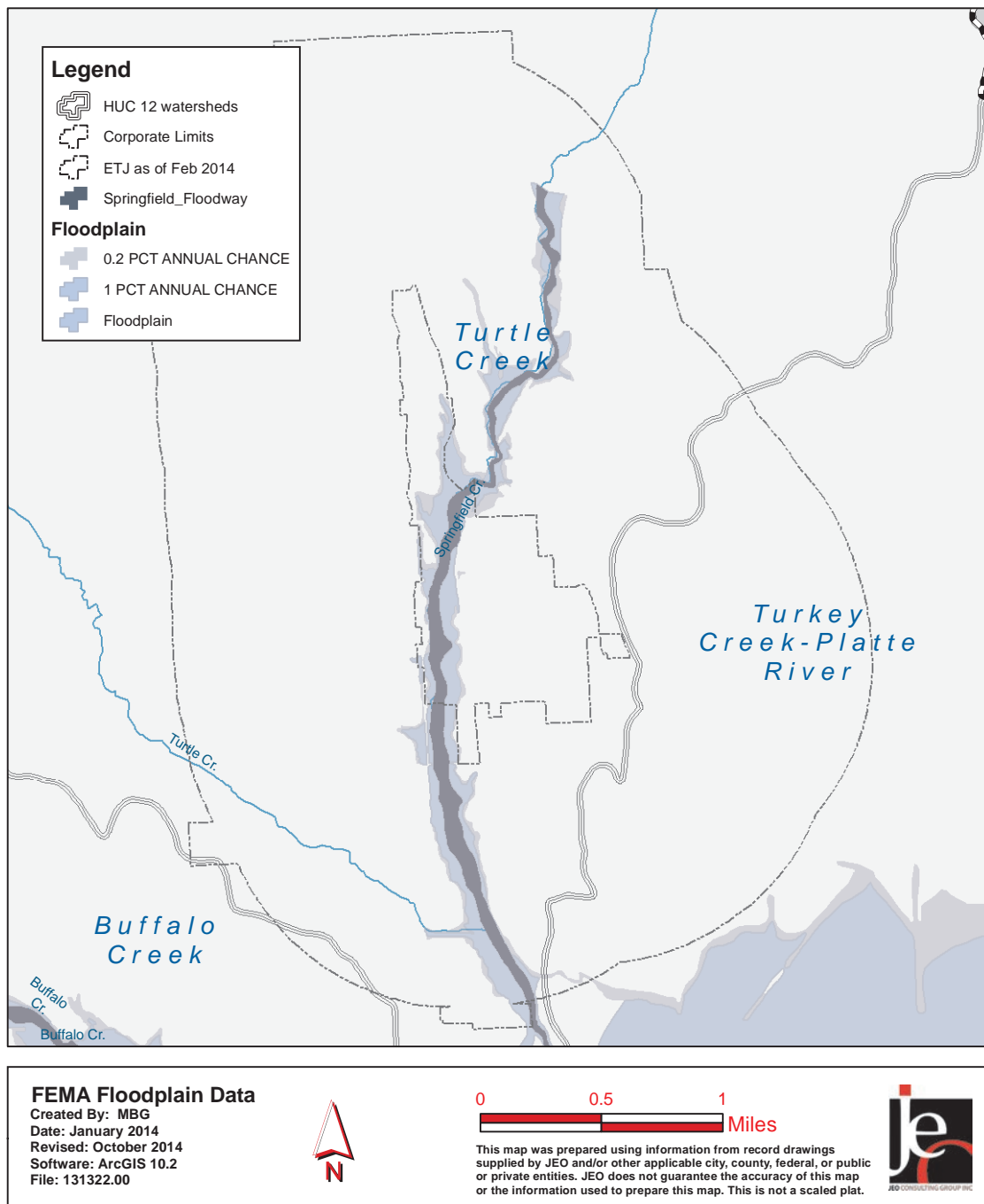


Figure 36 is a general representation of the floodplain boundaries and may not be 100% accurate. There are amendments to the hazard areas that may not be represented on this map. Property owners within or near floodplain boundaries have options. The owners could submit a Letter of Map Change if they believe their property has been inadvertently mapped in Special Flood Hazard Areas. Property owners near the boundaries may want to verify that their property is not within a special flood hazard area when developing or selling the property to avoid infringing upon the hazardous zones or affecting properties along Springfield Creek.

Figure 36 Floodplain in Springfield Jurisdiction



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Wellhead Protection

Wellhead Protection Areas

The Nebraska Department of Environmental Quality (NDEQ) regulates groundwater quality and quantity. The NDEQ helps assist local municipalities with protecting their drinking water supply with the development of the Nebraska Wellhead Protection (WHP) Program. In 1998, Nebraska Legislature passed LB 1161 (Neb. Rev. Stat. §46-01501 to 46-1509) authorizing the Wellhead Protection Area Act.

Wellhead Protection Areas were delineated with community safety in mind. Both subdivision and municipal wells serve its populations and pose a larger threat to public safety if contaminated. The ultimate goal of the WHP Program is to protect land and groundwater surrounding public drinking water supply wells from contamination.

The Wellhead Protection (WHP) Program provides the following in accordance with federal laws:

1. Duties of the governmental entities and utility districts
2. Determines protection area
3. Identifies contamination sources
4. Develop a contaminant source management program
5. Develop an alternative drinking water plan
6. Review contaminated sources in future wellhead areas
7. Involve the public

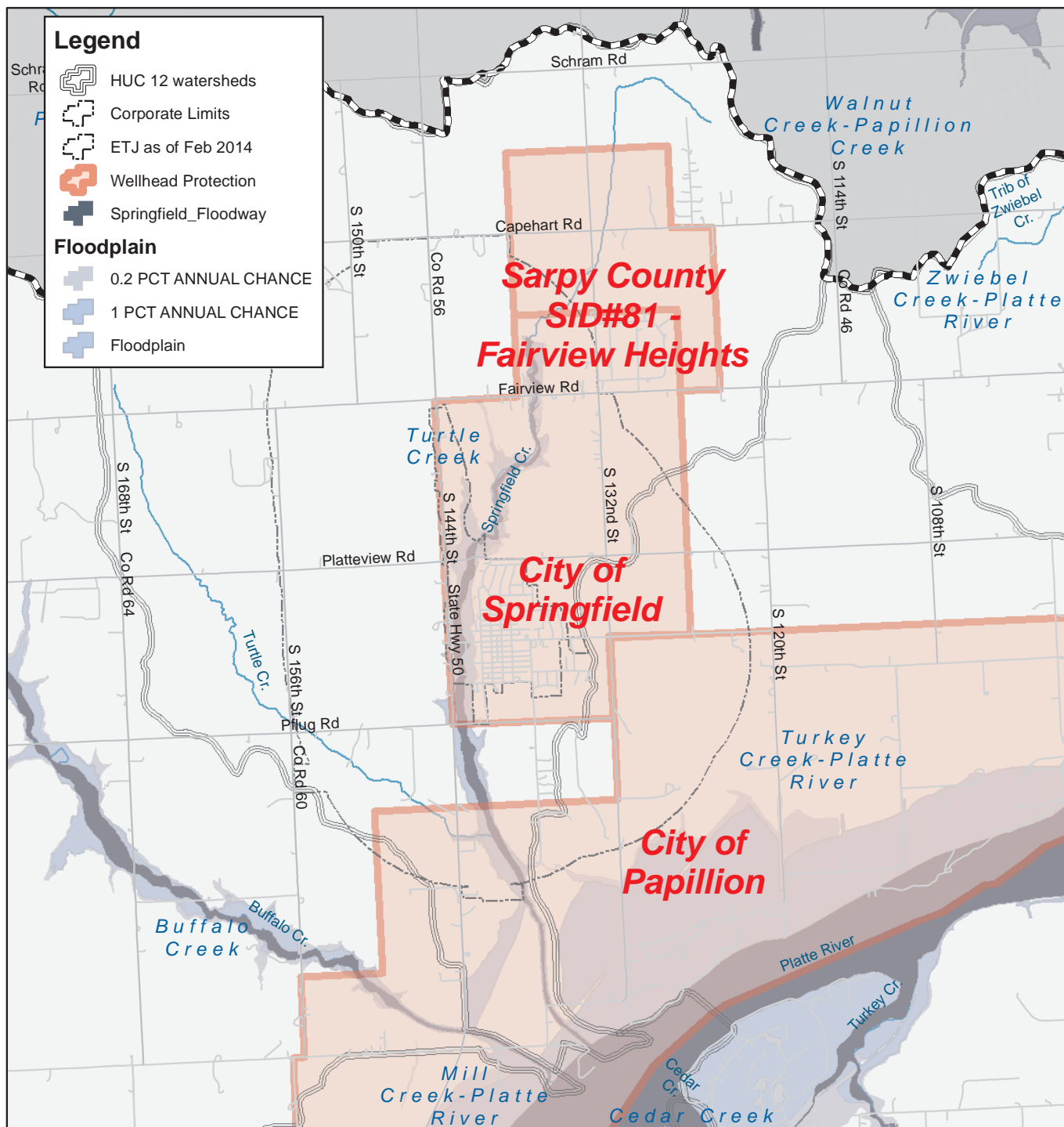
The approaches of Nebraska's Wellhead Protection (WHP) Program are to:

- Prevent the location of new contamination sources in Wellhead Protection Areas through planning.
- Minimize the hazard of existing contamination sources through management.
- Provide early warning of existing contamination through ground water monitoring.

The Wellhead Protection Area is a region with restrictive land use regulations to prevent potential contaminants from locating in the sensitive area. The boundaries are delineated by a time of travel cylindrical displacement calculation. The boundary is mapped by the Nebraska Department of Environmental Quality (NDEQ) so communities can apply zoning regulations to the district.

Portions of Fairview Heights Wellhead Protection Area (WPA) and City of Papillion's WPA are located within the city's extraterritorial jurisdiction. The City of Springfield will continue to regulate its wellhead districts with the specific wellhead protection zones and appropriate zoning methods. Additional education may be needed to stress the importance of protecting Springfield, Fairview Heights, and City of Papillion water supplies.

Figure 37 Wellhead Protection Areas in Springfield Jurisdiction



NDEQ Database

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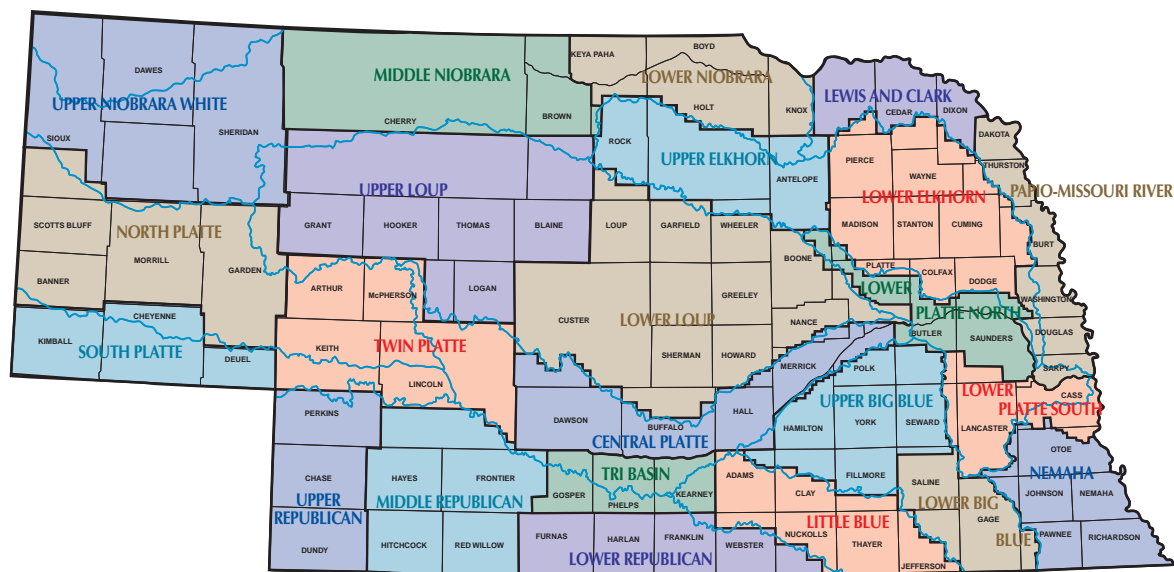
Hazard Mitigation

Hazard Mitigation Planning

Much like the Wellhead Protection Areas, the goal of the Hazard Mitigation Plan (HMP) is to identify threats to the public. The HMP document addresses both natural and man-made risks and is updated every five years in order to meet federal regulations. Therefore, short- and long-term solutions of regional or local issues can be addressed. This document plays an important role for future land uses.

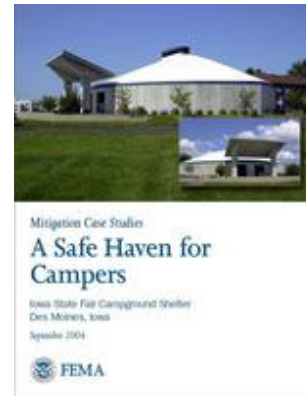
Springfield and Sarpy County are located within the Papio-Missouri Natural Resources District (NRD). This district is situated along the eastern edge of northeast Nebraska. The district stretches from Dakota County, Thurston County, Burt County, Washington County, Douglas County and Sarpy County. The connected District can be viewed as a larger watershed as discussed previously in local terms. The drain point is the Missouri River and ends at the Platte River confluence.

Figure 38 Nebraska's 23 Natural Resources Districts (NRDs)



The City of Springfield will continue to participate in the updates of the Papio-Missouri Natural Resources District's Hazard Mitigation Plans. It behooves the city to research, propose, and incorporate the city's capital improvements into potential Hazard Mitigation projects. Much like diligence with regards to protecting the wellhead districts, appropriate zoning methods may be needed to protect against natural hazard events. Additional education is recommended to stress the importance of protecting Sarpy County and Springfield residents.

Strategies to promote HMP education could include coordinating workshops with the Papio-Missouri NRD or handing out informational flyers each summer as the City of Springfield hosts the annual Sarpy County Fair. HMP project examples include building storm shelters on public property for crowds gathering in Springfield during community events such as Springfield Days or the Sarpy County Fair. The new Motor Sports Complex grandstand was built with a storm shelter underneath. This is located on the south side of the Fairgrounds. If the city looks to build a new City Hall, it might be in the public's best interest to speak with and evaluate such projects in conjunction with Papio-Missouri NRD and FEMA.



Although there would be restricted access to such a storm shelter, the available funding could reduce the city's or County Fair Board's fiscal obligations when constructing new buildings. For a regional example, the Iowa State Fairgrounds built a storm shelter in 2004 with a large capacity for visitors and campers in case of a tornado. This large structure is utilized with a massive bandstand on the backside of the shelter. Having an additional safe haven along the MoPac Trail could also become increasingly important as Springfield will see an increase of recreational visitors.

Figure 39 Papio-Missouri River NRD, Sarpy County



2.8 EXISTING LAND USE

Introduction

EXISTING LAND USE

Knowledge of existing land uses must be established before moving forward to determine future land uses. The purpose of this section is to establish the inventory and evaluation of the existing land uses found within Springfield and its planning jurisdiction.

The following land use categories will be analyzed in the Achieve Chapter for future development areas and land uses. The following categories are described with broad labels such as residential, commercial, and industrial, as well as an identification of vacant or open spaces, and recreational areas. In order to fully explain the variety of uses currently found, the description used in this section will include more detailed statements.

There is no set standard determining where and how communities develop. Each community has different opportunities and restraints that have helped or hindered the current development pattern. Land uses and properties do not have to be arranged in a 1:1 ratio with one particular land use per parcel. Land uses are often mingled within a development, and can be stacked on each other, such as uses in a downtown district.

The number and type of land uses found in a vibrant community is in constant flux; changing to meet the needs and desires of residents. The resulting effects can produce a number of beneficial or detrimental impacts on the overall sense of community and quality of life. Because of this potential, the success and sustainability of a community is directly influenced by the manner in which available resources are utilized given the constraints the city faces during the course of the planning period.

Identifying under-utilized or inappropriate land uses is important when examining current land use. It is also relevant to identify appropriate uses and options for adjacent undeveloped land. Springfield has experienced increased levels of development pressures, and has seen Sarpy County transform from a rural county into the suburban boundary of the Omaha Metropolitan Area. Springfield has maintained its small-town appeal while maintaining a vibrant Main Street. With recent success of new businesses coming to the Central Business District, it provides an example of how best to utilize existing infrastructure. A priority to the City of Springfield is to grow wisely rather than being the fastest growing community. Residents of Springfield have great opportunities with the community's local transportation network in proximity to Highway 50 and Interstate 80.

Categories

RESIDENTIAL LAND USES

Low Density Residential (LDR) 46.1%

Low Density Residential consists of a parcel of land with a residential structure occupied by one family. LDR represents the typical lot size, single-family house surrounded by yards on all sides. This land use represents 153 acres and 46 percent of Springfield.

Medium Density Residential (MDR) 0.2%

Medium Density Residential represents single family residential housing on smaller lots. MDR consists of four parcels on half an acre.

High Density Residential (HDR) 1.5%

High Density Residential contains the townhomes and apartment buildings that have multiple families on the same parcel. HDR represents five parcels on roughly five acres.

Mobile Homes (MH) 0.6%

This land use displays the grouping of mobile homes within defined property boundaries. Each parcel of land contains factory-built, single-family structures. Although single-family residential in nature, however MH is identified separately due to density of such housing units. There are four parcels with mobile housing units on 1.91 acres.

COMMERCIAL LAND USES

Central Business District (CBD) 0.5%

The Central Business District is located along Main Street. The parcels lie within the boundaries of the original downtown area and contain multiple public and quasi-public land uses, as well as general commercial. Residential living is permitted above the businesses which defines this district as mixed use district. The Central Business District contains 23 parcels on 1.73 acres.

General Commercial (GC) 4.9%

A General Commercial parcel has a commercial use which may sell goods, but mostly provides services, such as automotive repair or fast food restaurants. Springfield has 20 parcels of General Commercial on 16.41 acres.

General Industrial (GI) 4.6%

A General Industrial parcel contains a commercial use involved in manufacturing or packing, storage, or assembly of products, which does not have a major external effect on surrounding properties or uses. Springfield's General Industrial consists of 23 parcels on 15.30 acres.

COMMUNITY-BASED LAND USES

Park and Recreation (PR) 20.2%

A Park and Recreation parcel of land contains public or private land available for recreational, educational, cultural, or aesthetic use. There are nine parcels of Park and Recreation with 67.18 acres.

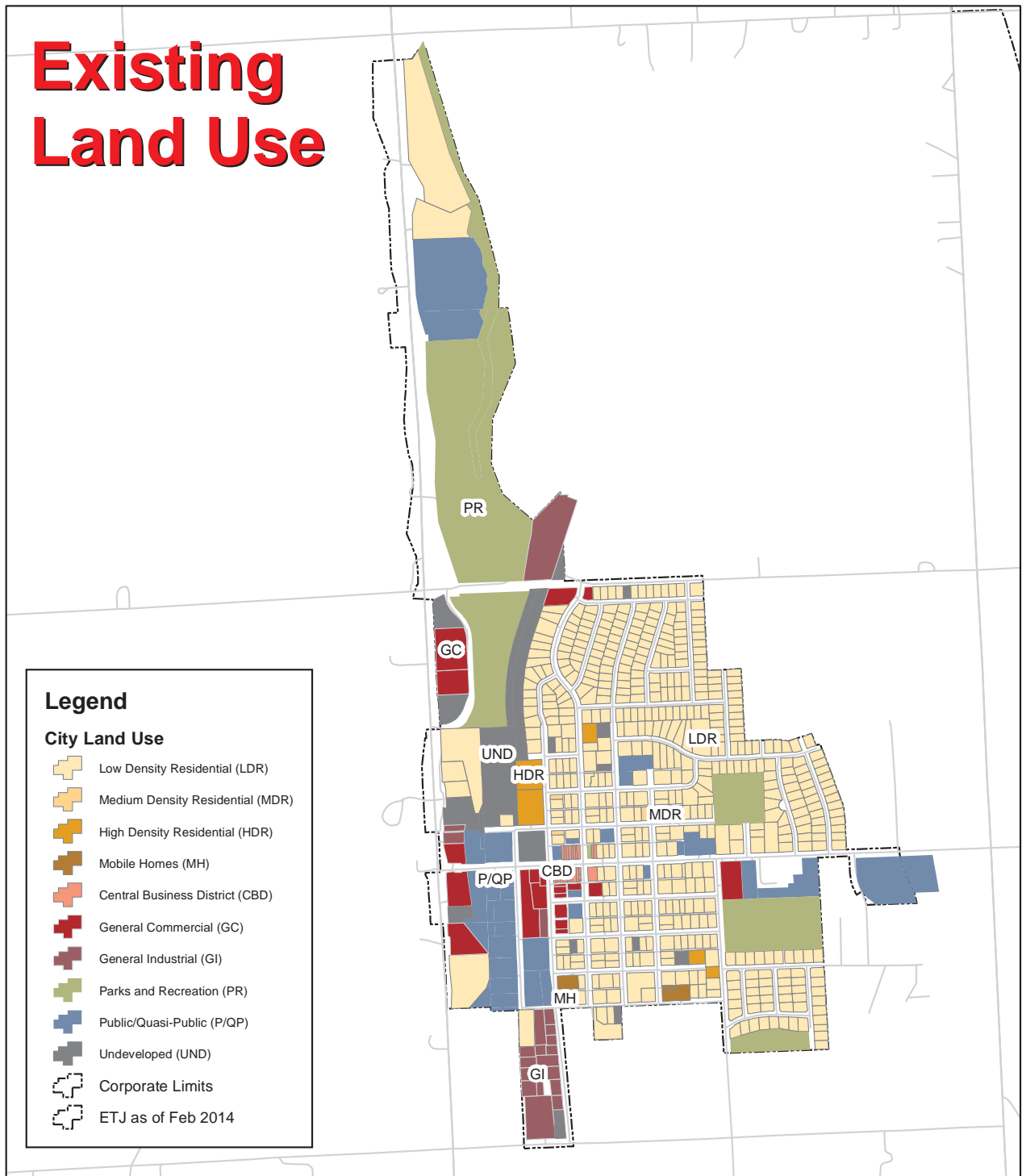
Public and Quasi-Public (P/QP) 14.3%

A Public/Quasi-Public parcel of land is owned or maintained by a federal, state, or a local governmental entity and open for enjoyment by public, or a parcel of land containing a use that is generally under the control of a private, religious, or non-profit entity, that provides social benefit to the community as a whole. The public and quasi-public represent 40 parcels and 47.63 acres.

Undeveloped (UND) 7.0%

Springfield's undeveloped properties have different land uses associated to each parcel. It may be unbuildable, due to floodplain, and left as open space. Others might be a vacant residential lot without a house. This identification was shown on the Existing Land Use Map to provide current opportunities within the corporate limits. There are 24 parcels on 23.33 acres of undeveloped or vacant land.

Figure 40 Existing Land Use Map



Existing Land Use

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0 0.25 0.5
Miles

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EXISTING TRANSPORTATION

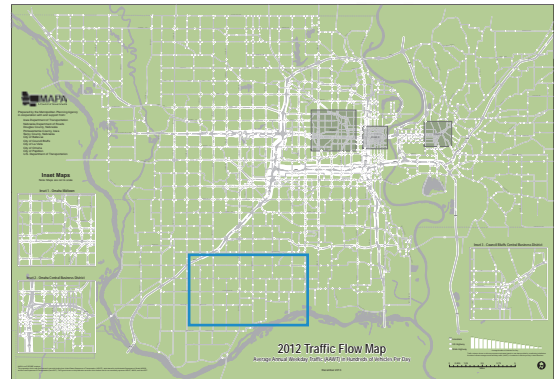
MAPA

The Greater Omaha Metropolitan Area relies heavily on the automobile Transportation Network. For the City of Springfield, it has two main transportation routes. State Highway 50 carries traffic north and south while Platteview Road carries residents east and west. Springfield is surrounded by rural residents that rely on a smaller-scale rural transportation networks and local collections.

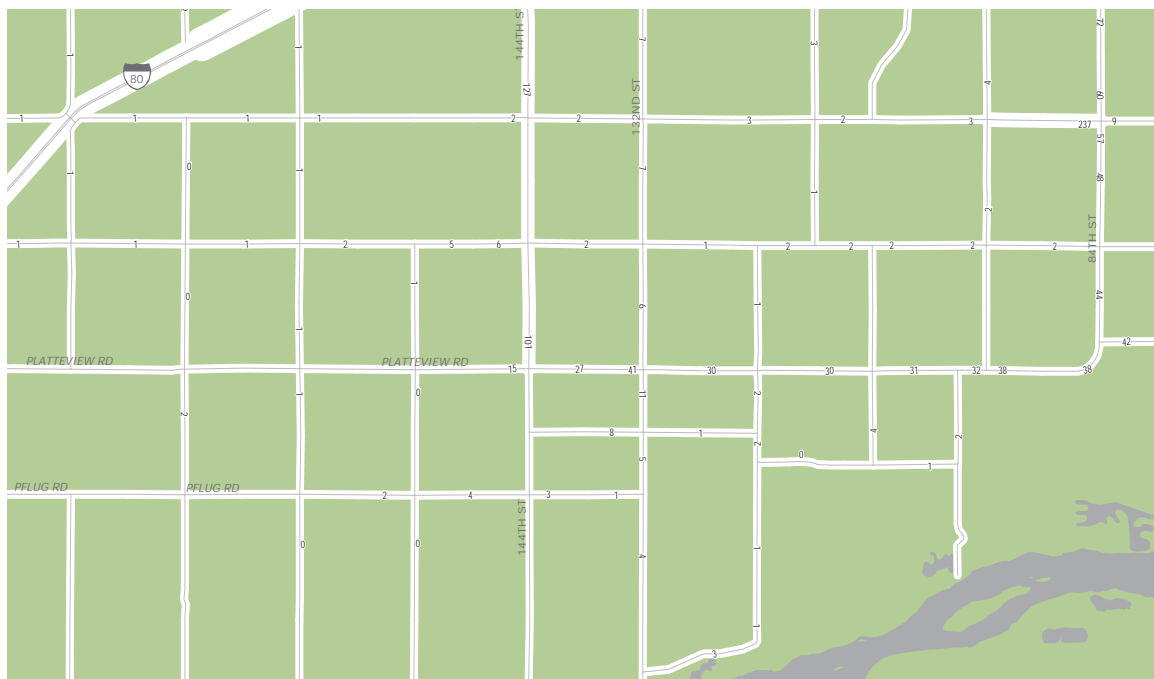
The Metropolitan Area Planning Agency (MAPA) conducts traffic studies of the Omaha and Council Bluffs Metropolitan areas to determine an estimated traffic flow of its surrounding transportation network.



“Travel volumes shown on this map represent estimates based on raw data provided by contributing jurisdictions. Numbers indicate average annual weekday traffic (AAWT) in hundreds of vehicles per day in both directions”



The traffic study estimates reveal how the City of Springfield and surrounding rural population travel through the area and the importance of maintaining this transportation system. After examining previous decade's maps, the Springfield Traffic Count Trends (Table 5) display the changes in Highway 50, Platteview, and local transportation network traffic.



Closeup of MAPA's 2012 Traffic Flow Map

Past Traffic Trends

Table 5 MAPA Traffic Flow Trends, Springfield Area

Springfield Traffic Count Trends			
Average Annual Weekday Traffic (AAWT)	1992	2002	2012
State Highway 50 / 144th Street			
North of Capehart Road	10,000	8,600	12,700
North of Platteview Road	9,000	7,500	10,100
South of Platteview Road	7,000	6,900	8,500
West of Highway 50 / 144th Street			
Pflug Road	NA	800	400
Platteview Road	1,200	800	1,500
Capehart Road	200	400	200
Fairview Road	100	400	600
Springfield Local Traffic			
Platteview Road - East of Hwy 50/144th	3,100	3,900	2,700
Platteview Road - East of 132nd Street	2,700	4,500	3,000
Main Street	1,000	1,800	800
Pflug Road - East of Hwy 50 /144th Street	1,800	300	300
Pflug Road - near 132nd Street	300	200	100
132nd St - North of Platteview Road	200	1,000	900
132nd St - Platteview to Main Street	700	1,000	1,100
132nd St - Main to Pflug	400	600	500
132nd St - South of Pflug	NA	600	400
MAPA Traffic Flow Maps, 1992, 2002, 2012			

Classifications

The Nebraska State Classifications identifies State Highway 50 or 144th Street as a Major Arterial (Intermediate). However, no other identification is associated to Springfield's transportation network. Therefore, the Federal Functional Classifications proposed by Metropolitan Area Planning Agency (MAPA) in 2012 will be used to identify Springfield's existing transportation network. The classifications are based upon the mobility, based upon restrictions or accessibility, and land access.

Some of the identified classifications or roads are not depicted on the existing transportation map. For example, Highway 370 is not shown due to the scale of the map and detail needed to show relevant local traffic.

Interstate: Interstate 80

This federal roadway has the highest amount of movement of all roadways and the least amount of access points.

Arterial Roads generally provide the fastest method of travel with limited accessibility for the longest uninterrupted distance. In the Springfield area, they are labeled Rural Arterials with identification of Principal and Minor. The speeds of rural arterials are generally above 50 mph and Springfield examples of principal and minor arterial roads include:

Rural Principal Arterial: Highway 370

This traffic has the least accessibility and moves traffic east or west.

Rural Minor Arterial: Highway 50

This Rural Minor Arterial has limited accessibility and carries traffic north and south.

Collectors provide a less highly developed level of service at a lower speed for shorter distances. They are important connection points between local roads to the limited access arterials. Typically the speeds of rural collectors are less than 50 mph and the Springfield area has several roadways labeled rural major or minor collectors.

Rural Major Collector: Platteview Road, Buffalo Road, 132nd Street north of Platteview

Rural Minor Collector: Pflug Road west of Hwy 50, Fairview Road, 180th Street between Buffalo Road to Fairview Road, Springfield's Main Street, 132nd between Platteview Road and Main Street, 120th north of Platteview, 114th Street north of Fairview Road

Local Roads

The numerous local roads have the most accessibility to land as well as the slowest movement of traffic or shorter distances. The speed of local roads depends on the distances of each roadway.



Safety Effectiveness of Highway Design Features, Volume I, Access Control, FHWA, 1992

Figure 41 Existing Transportation, Springfield Jurisdiction



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