

Deuel County Appendix

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County Profile

Deuel County

**South Platte NRD
Hazard Mitigation Plan 2022**

Local Planning Team

Table DEU.1: Deuel County Local Planning Team

Name	Title	Jurisdiction
Steven Fischer	County Commissioner	Deuel County
Anthony Armer	Highway Superintendent	Deuel County

Location, Geography, and Climate

Deuel County is located in western Nebraska and is bordered by Cheyenne, Garden and Keith Counties in Nebraska and Sedgwick County in Colorado. The total area of Deuel County is 441 square miles. The major waterways within the county are Lodgepole Creek and the South Platte River. The county is not heavily forested, nor is it located in a geographic area of the state prone to landslides. Most of Deuel County lies in the plains topographic region, with the vast majority of the county's land characterized by agricultural fields or rangeland.

Climate

The table below compares climate indicators with those of the entire state. Climate data is helpful in determining if certain events are higher or lower than normal. For example, if the high temperatures in the month of July are running well into the 90s, high heat events may be more likely which could impact vulnerable populations.

Table DEU.2: Deuel County Climate Normals

	Deuel County	State of Nebraska
July Normal High Temp ¹	88.6 °F	88.0 °F
January Normal Low Temp ¹	14.0 °F	12.0 °F
Annual Normal Precipitation ²	18.8 inches	30.3 inches
Annual Normal Snowfall ²	27.9 inches	25.9 inches

Source: NCEI 1981-2010 Climate Normals¹, High Plains Regional Climate Center, 1981-2010²
Precipitation includes all rain and melted snow and ice.

Transportation

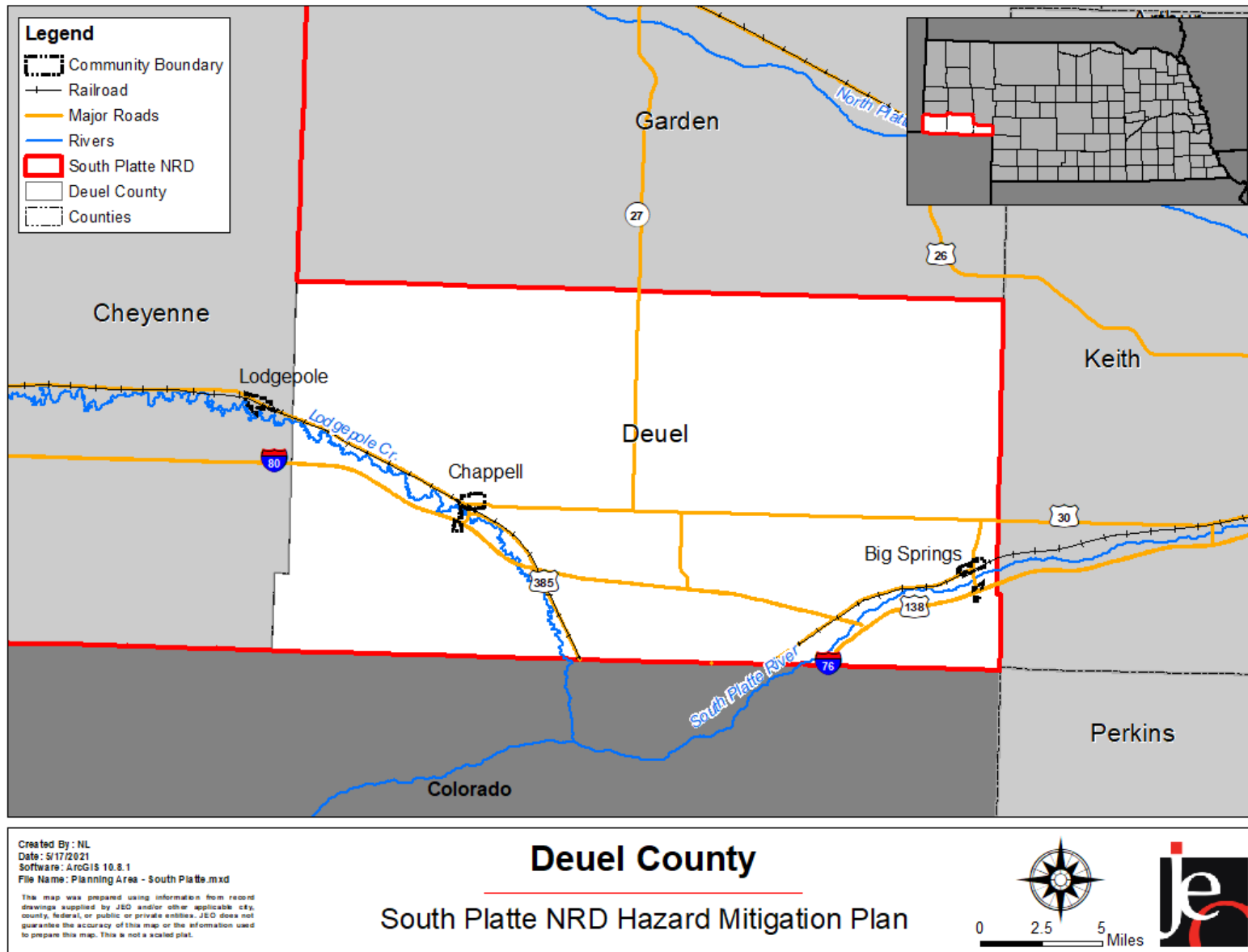
Deuel County's major transportation corridors include US Highway 30 and Nebraska Highway 27. Highway 30 which runs east/west through the county and accommodates approximately 2,260 vehicles per day, 115 of which are heavy commercial vehicles. Highway 27 runs north/south through the county and accommodates approximately 480 vehicles per day, 50 of which are heavy commercial vehicles.³ Interstate 80 also runs east/west through the center of the county. Deuel County has a number of air landing strips dispersed throughout the county and the Union Pacific Railroad runs east/west through the center of the county.

¹ National Centers for Environmental Information. "1981-2010 U.S. Climate Normals." Accessed May 2021. <https://www.ncdc.noaa.gov/cdo-web/datatools>.

² High Plains Regional Climate Center. "Monthly Climate Normals 1981-2010 – Chappell, NE." Accessed May 2021. <http://climod.unl.edu/>.

³ Nebraska Department of Transportation. 2020. "Interactive Statewide Traffic Counts Map." [map]. <https://gis.ne.gov/portal/apps/webappviewer/index.html?id=8ed4b009b0d546f19f0284e5bba0f972>

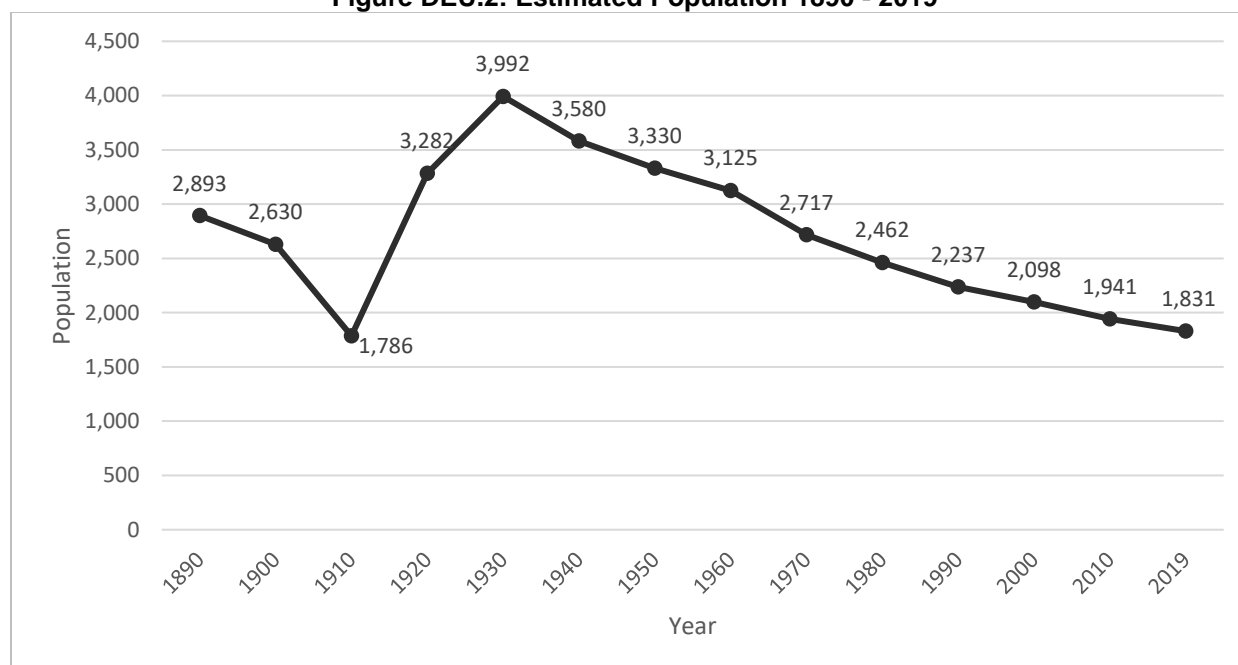
Figure DEU.1: Deuel County



Demographics

The following figure displays the historical population trend from 1890 to 2019. This figure indicates that the population of Deuel County decreased dramatically from 1890 to 1910. Between 1910 and 1930 the population more than doubled in size. However, it has steadily decreased since then. This is notable for hazard mitigation because counties with declining population may also have a higher level of unoccupied housing that is not being kept up. Furthermore, areas with declining population may be less prone to pursuing residential/commercial development in their areas, which may reduce the number of structures vulnerable to hazards in the future. Decreasing populations can also represent decreasing tax revenue for communities and the county, which could make implementation of mitigation and strategic actions more fiscally challenging.

Figure DEU.2: Estimated Population 1890 - 2019



Source: U.S. Census Bureau⁴

The following table indicates Deuel County has a smaller percentage of people under the age of five than the State of Nebraska. The county has a smaller percentage of people between the ages of 5 and 64 and a larger percentage of those over 64. The median age in Deuel County is larger than the state. This information is relevant to hazard mitigation as the very young and elderly populations may be at greater risk from certain hazards than others. For a more elaborate discussion of this vulnerability, please see *Section Four: Risk Assessment*.

Table DEU.3: Population by Age

Age	Deuel County	State of Nebraska
<5	5.7%	6.9%
5-64	70.7%	77.7%
>64	23.5%	15.4%
Median	49.3	36.5

Source: U.S. Census Bureau⁵

⁴ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

⁵ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

SECTION SEVEN: DEUEL COUNTY COMMUNITY PROFILE

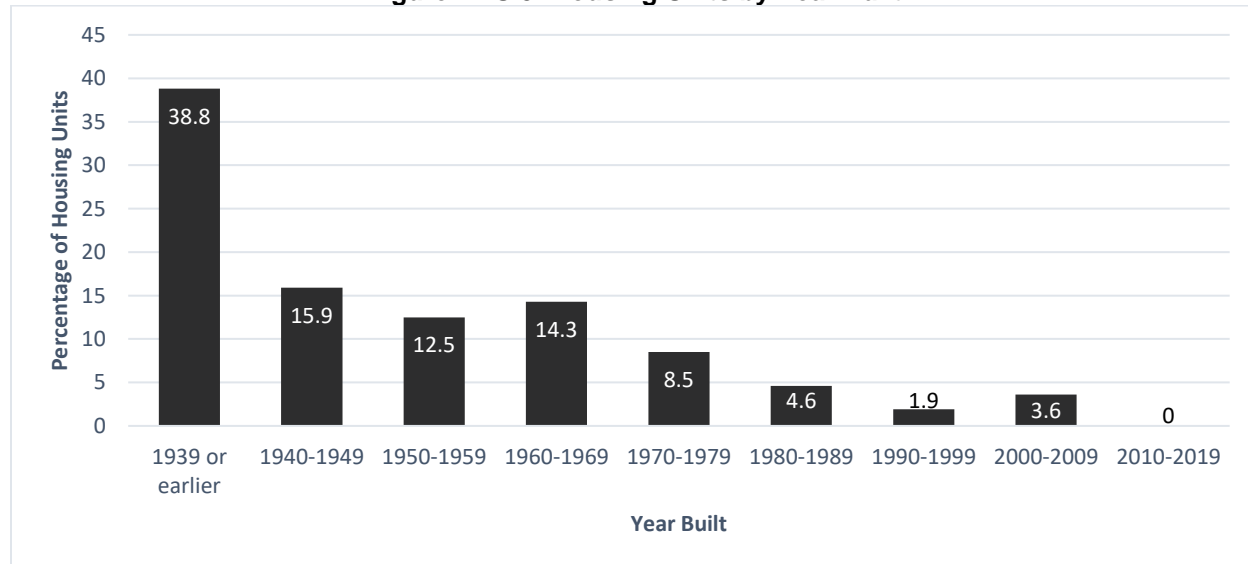
The following table indicates that median household income and per capita income for the county is lower than the State of Nebraska. Median home value and rent are also both lower than the rest of the state. These economic indicators are relevant to hazard mitigation because they indicate the relative economic strength compared to the state as a whole. Areas with economic indicators which are relatively low may influence a county’s level of resilience during hazardous events.

Table DEU.4: Housing and Income

	Deuel County	State of Nebraska
Median Household Income	\$47,287	\$61,439
Per Capita Income	\$26,351	\$32,302
Median Home Value	\$87,300	\$155,800
Median Rent	\$631	\$833

The following figure indicates that most of the housing in Deuel County was built prior to 1970. According to the Census Bureau, the county has 1,066 housing units; with 77.9 percent of those units being occupied. 5 percent of the county’s housing is classified as mobile homes. Housing age can serve as an indicator of risk as structures built prior to the development of state building codes may be more vulnerable to hazards. The State of Nebraska first adopted building codes in 1987 and the state currently has adopted the 2018 International Building Code. Finally, communities with a substantial number of mobile homes may have a higher number of residents vulnerable to the impacts of high winds, tornadoes, and severe winter storms.

Figure DEU.3: Housing Units by Year Built



Source: U.S. Census Bureau⁶

⁶ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

Table DEU.5: Housing Units

Jurisdiction	Total Housing Units				Occupied Housing Units			
	Occupied		Vacant		Owner		Renter	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Deuel County	830	77.9%	236	22.1%	633	76.3%	197	23.7%
Nebraska	759,176	90.7%	78,300	9.3%	501,679	66.1%	257,497	33.9%

Source: U.S. Census Bureau⁷

Major Employers

According to 2018 Business Patterns Census Data, Deuel County had 56 business establishments. The following table presents the number of establishments, number of paid employees, and the annual payroll in thousands of dollars. Communities which have a diverse economic makeup may be more resilient following a hazardous event, especially if certain industries are more impacted than others.

Table DEU.6: Businesses in Deuel County

	Total Businesses	Number of Paid Employees	Annual Payroll (in thousands)
Total for All Sectors (2012)	56	341	\$7,941
Total for All Sectors (2018)	56	306	\$9,909

Source: U.S. Census Bureau⁸

Agriculture is also important to the economic fabric of Deuel County, and the state of Nebraska as a whole. Deuel County's 225 farms cover 276,135 acres of land, about 98% of the county's total area. Crop and livestock production are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing, and marketing farm and food products. These businesses generate income, employment, and economic activity throughout the region.

Table DEU.7: Deuel County Agricultural Inventory

Deuel County Agricultural Inventory	
Number of Farms	225
Land in Farms (acres)	276,135

Source: USDA 2017 Census of Agriculture⁹

Future Development Trends

Other than a small number of new businesses and some road resurfacing, not much development has taken place in Deuel County over the past five years. According to census estimates, Deuel County's population is decreasing. The local planning team attributes this to having an older population and a decreasing number of jobs.

⁷ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

⁸ United States Census Bureau. "2018 Census Bureau American Community Survey: Geography Area Series County Business Patterns 2018 Business Patterns." [database file]. <https://data.census.gov>.

⁹ United States Department of Agriculture, National Agricultural Statistics Server. 2019. "2017 Census of Agriculture – County Data." <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>.

Structural Inventory and Valuation

GIS parcel data as of July 2021 was requested from GIS Workshop, which the county hires to manage the County Assessor data. This data was analyzed for the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the following table.

Table DEU.8: Deuel County Parcel Valuation

Total Number of Improvements	Total Improvement Value	Number of Improvements in Floodplain	Value of Improvements in Floodplain	% of Improvements in Floodplain
1,229	\$93,834,680	116	\$16,967,245	9%

Source: County Assessor

Community Lifelines

Hazardous Materials – Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environment and Energy, there are 14 chemical storage sites throughout Deuel County that contain hazardous chemicals. In the event of a chemical spill, the local fire department and emergency response may be the first to respond to the incident. For a description of chemical sites located in incorporated areas, please see the jurisdiction's participant section.

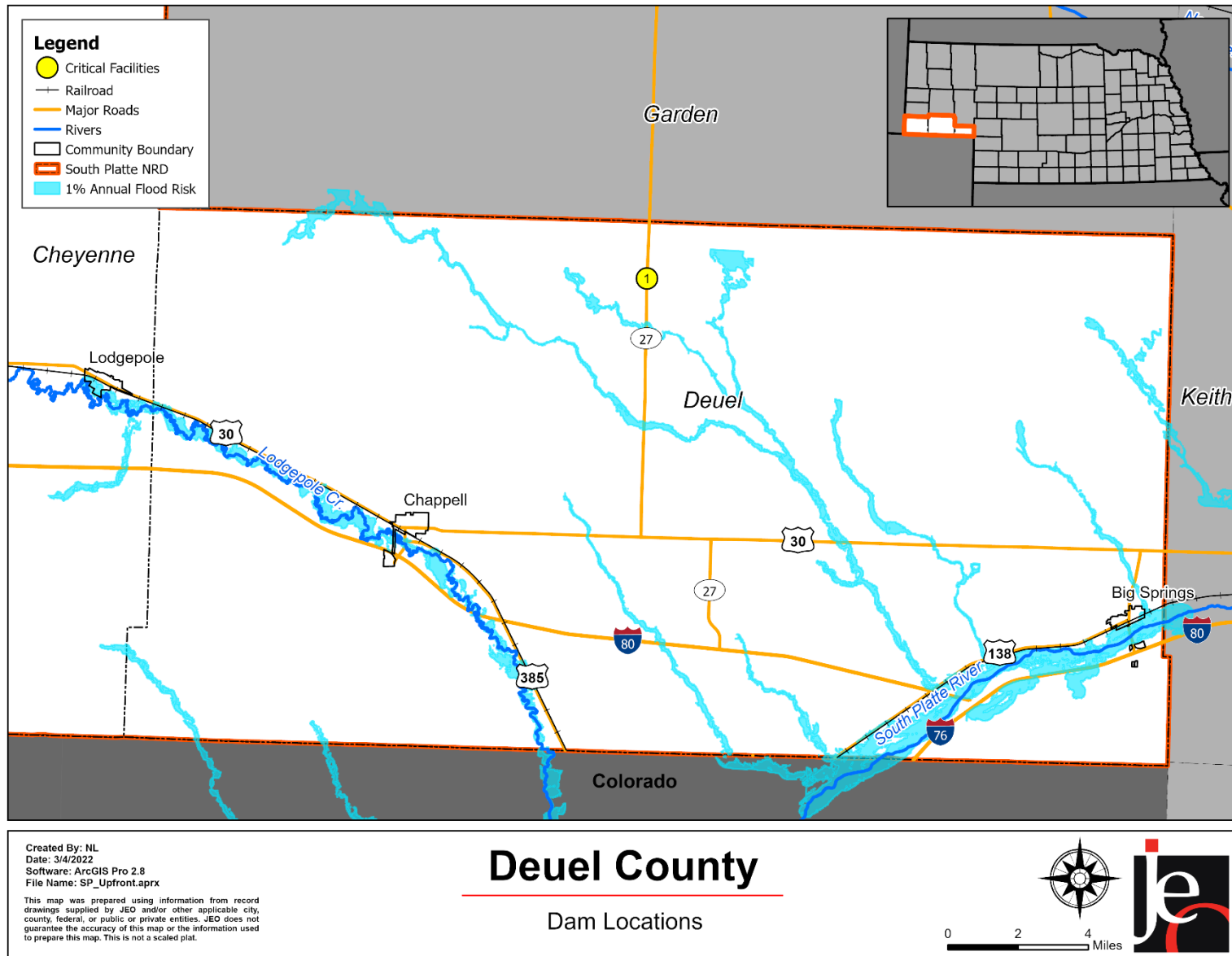
Critical Facilities

Each participating jurisdiction identified critical facilities vital for disaster response, providing shelter to the public, and are essential for returning the jurisdiction's functions to normal during and after a disaster. Critical facilities were identified during the original planning process and updated by the local planning team as a part of this plan update. The following table and figure provide a summary of the critical facilities for the jurisdiction.

Table DEU.9: Critical Facilities

CF #	Name	Shelter (Y/N)	Generator (Y/N)	Floodplain (Y/N)
1	Berea Lutheran Church	N	N	N

Figure DEU.4: Critical Facilities



Governance

A county's governance indicates the number of boards or offices that may be available to help implement hazard mitigation and strategic actions. Deuel County has three-member board of commissioners and the following departments and offices.

- Assessor
- Attorney
- Clerk
- Highway Superintendent
- Sheriff
- Surveyor
- Treasurer
- Veteran Services Officer
- Weed Superintendent

Capability Assessment

The capability assessment consisted of a Capability Assessment Survey completed by the jurisdiction and a review of local existing policies, regulations, plans, and the programs. The survey is used to gather information regarding the jurisdiction's planning and regulatory capability; administrative and technical capability; fiscal capability; and educational and outreach capability.

Table DEU.11: Capability Assessment

Survey Components/Subcomponents		Yes/No
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Economic Development Plan	No
	Emergency Operations Plan	Yes
	Floodplain Management Plan	Yes
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	
	Building Codes	No
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Floodplain Administration	Yes
	GIS Capabilities	Yes
	Chief Building Official	No
	Civil Engineering	No
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Yes

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	Grant Manager	No
	Mutual Aid Agreement	Yes
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1 & 6 Year plan	Yes
	Applied for grants in the past	Yes
	Awarded a grant in the past	Yes
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	No
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	Yes
	StormReady Certification	Yes
	Firewise Communities Certification	No
	Tree City USA	N/A
	Other (if any)	

Table DEU.12: Overall Capability

Overall Capability	Limited/Moderate/High
Financial resources needed to implement mitigation projects	Limited
Staff/expertise to implement projects	Limited
Community support to implement projects	Limited
Time to devote to hazard mitigation	Limited

Plan Integration

Deuel County has multiple planning documents that discuss or relate to hazard mitigation. Each applicable planning mechanism is listed below along with a short description of how it is integrated with the hazard mitigation plan. The county will seek out and evaluate any opportunities to integrate the results of the current hazard mitigation plan into other planning mechanisms and updates.

Comprehensive Plan (2016)

The comprehensive plan is designed to guide the future actions and growth of the county. It contains goals aimed at Safe Growth and encourages infill development. The county plans to update the comprehensive plan in 2026.

Deuel County Local Emergency Operations Plan (2017)

The Deuel County Local Emergency Operations Plan (LEOP) establishes standardized policies, plans, guidelines, and procedures for emergency resources and governmental entities to respond and recover when a disaster event occurs. It contains information regarding direction and control, communications and warning, damage assessment, emergency public information, evacuation, fire services, health and human services, law enforcement, mass care, protective shelters, and resource management. This plan is updated every five years.

Zoning Ordinance, Floodplain Regulations, and Subdivision Regulations (2015)

The county’s zoning ordinance, floodplain regulations, and subdivision regulations outline where and how development should occur in the future. These documents contain floodplain maps, discourage development in the floodplain, include well setback requirements, include the ability to implement water restrictions, and restrict subdivision of land within or adjacent to the floodplain. The floodplain regulations are in the process of being updated; however, there is currently no timeline to update the zoning ordinance and subdivision regulations.

Western Sandhills Community Wildfire Protection Plan (2019)

The Nebraska Forest Service developed the Western Sandhills Community Wildfire Protection Plan (CWPP), which includes Deuel County, in October 2019. The purpose of the CWPP is to help effectively manage wildfires and increase collaboration and communication among organizations who manage fire. The CWPP discusses county specific historical wildfire occurrences and impacts, identifies areas most at risk from wildfires, discusses protection capabilities, and identifies wildfire mitigation strategies. This document will be updated every five years.

Plan Maintenance

Hazard Mitigation Plans should be living documents and updated regularly to reflect changes in hazard events, priorities, and mitigation and strategic actions. These updates are encouraged to occur after every major disaster event, alongside community planning documents (i.e. annual budgets and Capital Improvement Plans), during the fall before the HMA grant cycle begins, and/or prior to other funding opportunity cycles begin including CDBG, Water Sustainability Fund, Revolving State Fund, or other identified funding mechanisms.

The local planning team is responsible for reviewing and updating this community profile as changes occur or after a major event. The local planning team will include the Roads Superintendent, Fire Chief, Sheriff, and EMS representative. The plan will be reviewed bi-

annually. The public will be included in the review and revision process through the Sheriff's Department program.

Historical Occurrences

The following table provides a statistical summary for hazards that have occurred in the county. The property damages from the NCEI Storm Events Database (January 1996 – April 2021) should be considered only as broad estimates. Sources include but are not limited to: emergency management; local law enforcement; Skywarn spotters; NWS damage surveys; newspaper clipping services; insurance industry; and the general public. Crop damages reports come from the USDA Risk Management Agency for Deuel County between 2000 and 2020.

Table DEU.13: Hazard Events for Deuel County

Hazard Type		Count	Property	Crop ²
Agricultural Disease	Animal Disease ¹	0	0 animals	N/A
	Plant Disease ²	34	N/A	\$2,758,039
Dam Failure⁵		0	\$0	N/A
Drought⁷		438/1,512 months	\$0	\$17,276,909
Earthquakes⁸		0	\$0	\$0
Extreme Heat⁶		Avg. 5 days/yr	\$0	\$2,834,294
Flooding⁹	Flash Flood	4	\$25,000	\$7,897
	Flood	4	\$2,000	
Grass/Wildfire¹⁰ <i>Injuries: 1</i>		153	\$166,435	\$28,818
Hail⁹ <i>Average: 1.3 in.</i> <i>Range: 0.75 - 3.5</i>		182	\$528,000	\$17,786,527
Hazardous Materials - Fixed Sites³		0	\$0	N/A
Hazardous Materials - Transportation⁴		12	\$194,116	N/A
High Winds⁹ <i>Average: 53 mph</i> <i>Range: 40-74 mph</i>		43	\$30,000	\$1,510,209
Levee Failure¹¹		0	\$0	N/A
Severe Thunderstorms⁹	Thunderstorm Wind <i>Average: 64 mph</i> <i>Range: 58-105 mph</i>	66	\$138,700	N/A
	Heavy Rain	1	\$0	\$1,871,319
	Lightning	0	\$0	N/A
Severe Winter Storms⁹	Blizzard	8	\$50,000	\$5,512,616
	Extreme Cold/Wind Chill	8	\$0	
	Heavy Snow	3	\$5,000	
	Ice Storm	0	\$0	

SECTION SEVEN: DEUEL COUNTY COMMUNITY PROFILE

Hazard Type		Count	Property	Crop ²
	Winter Storm	41	\$0	
	Winter Weather	0	\$0	
Terrorism and Civil Disorder¹²		0	\$0	N/A
Tornadoes⁹	Tornado <i>Average: EF0</i> <i>Range: EF0-EF1</i>	12	\$215,000	\$0
Totals		571	\$1,354,251	\$49,586,627

N/A: Data not available

1 NDA (2014-2020)

2 USDA RMA (2000-2020)

3 NRC (1990-2020)

4 PHMSA (1971-2020)

5 DNR Dam Inventory (May 2021)

6 HPRCC (1918 - May 2021)

7 NOAA (1895-2020)

8 USGS (1900-2020)

9 NCEI (January 1996 - April 2021)

10 NFS (January 2000 - 2020)

11 USACE NLD (May 2021)

12 Global Terrorism Database (1970-2017)

The following table provides a summary of hazards that have or have the potential to affect each participating jurisdiction in Deuel County. Each jurisdiction was evaluated for previous hazard occurrence and the probability of future hazard events on each of the 16 hazards profiled in this plan. The evaluation process was based on data collected and summarized in Table DEU.14; previous impacts or the potential for impacts to infrastructure, critical facilities, people, and the economy; and the proximity to certain hazards such as dams and levees. For example, while there have not been instances of dam failure in the county, there exists a possibility for a dam to fail in the future due to the presence of dams in the county.

Table DEU.14: Deuel County Hazard Matrix

Hazard	Deuel County	Village of Big Springs	City of Chappell
Animal and Plant Disease	X	X	X
Dam Failure	X		X
Drought	X	X	X
Earthquakes	X	X	X
Extreme Heat	X	X	X
Flooding	X	X	X
Grass/Wildfire	X	X	X
Hail	X	X	X
Hazardous Materials - Fixed Sites	X	X	X
Hazardous Materials - Transportation	X	X	X

SECTION SEVEN: DEUEL COUNTY COMMUNITY PROFILE

Hazard	Deuel County	Village of Big Springs	City of Chappell
High Winds	X	X	X
Levee Failure			
Severe Thunderstorms	X	X	X
Severe Winter Storms	X	X	X
Terrorism and Civil Disorder	X	X	X
Tornadoes	X	X	X

County Hazard Prioritization

For additional discussion regarding area-wide hazards, please see *Section Four: Risk Assessment*. The hazards discussed in detail below were either identified in the previous HMP and determined to still be of top concern or were added by the local planning team based on the identification of hazards of greatest concern, hazard history, and the jurisdiction's capabilities.

Animal and Plant Disease

Deuel County identified animal and plant disease as a top concern. Agriculture comprises the majority of Deuel County's economy, and the local planning team indicated that an agricultural disease outbreak would be detrimental to the county economy. The most common crops in the area are corn, wheat, soybeans, sunflower, and popcorn.

To mitigate lasting impacts as a result of animal and plant disease, the University of Nebraska-Lincoln offers public education classes regarding disease and animal health. Also, agricultural producers are encouraged to purchase insurance to defer risk of loss.

Dam Failure

According to the USACE National Inventory of Dams, there are three dams in Deuel County; however, none have been identified as high hazard dams. A "high hazard" designation is not an evaluation of the condition of a dam. Instead, it signifies the high number of individuals that live downstream from it. Table DEU.15 provides details of dams in the county and their hazard level. Figure DEU.5 shows a map of all dams within the county. They can also be viewed on the Nebraska Department of Natural Resources Dam Inventory map (<https://dnr.nebraska.gov/dam-safety>).

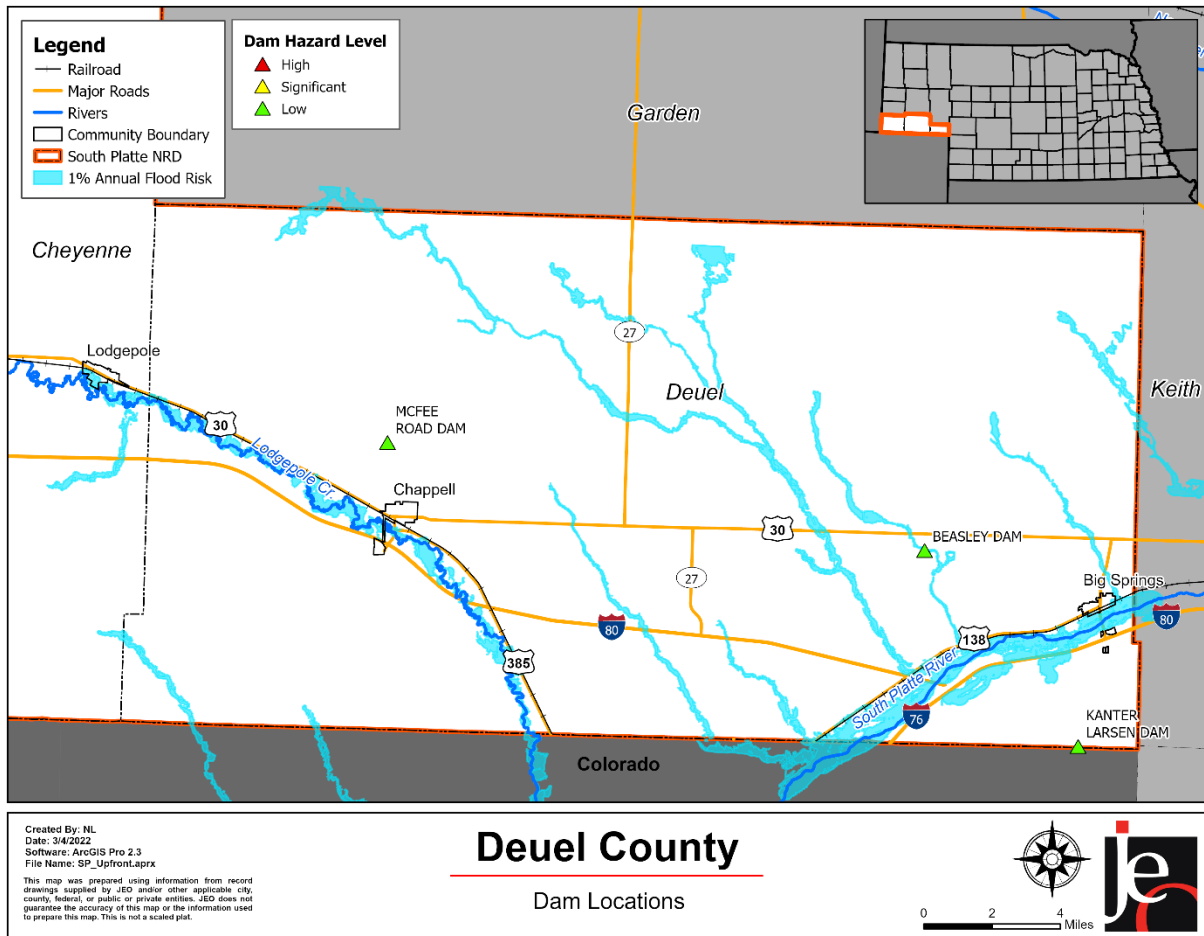
Table DEU.15: Dams in Deuel County

	Number of Dams	Low	Significant	High
Deuel County	3	3	0	0
Planning Area	49	36	6	7

Source: USACE, 2021¹⁰

¹⁰ United States Army Corps of Engineers. February 2021. "National Inventory of Dams." <https://nid.sec.usace.army.mil/ords/f?p=105:19:15077170345077::NQ::>

Figure DEU.5: Dams in Deuel County



Flooding

The local planning team indicated that flooding is common. This hazard is especially common during the spring while precipitation levels are high, and rivers are running high due to a melting snowpack from the winter. The most recent significant flooding event occurred in the spring of 2014. Flooding was so significant in parts of the area near Big Springs that the railroad tracks needed to be sandbagged to keep floodwaters away.

Grass/Wildfire

Deuel County identified grass/wildfire as a top concern. Deuel County indicated that grass/wildfires had occurred throughout the county in the past. The local planning team noted that due to the common high winds in the county, wildfires have the capability to spread very quickly. The local planning team is most concerned about July-November, which tends to be the driest time of year, and when the most vegetation is available for combustion.

Water scarcity can be an issue in certain parts of the county. Very few of the wells in the surrounding area are outfitted with adapters for fire trucks.

Hazardous Materials – Transportation

Deuel County identified transportation-related hazardous materials as a top concern. While the county has never experienced a significant chemical spill, Deuel County has a number of major transportation corridors (both road and rail) which transport a number of unknown chemicals. According to the local planning team, the unknown nature of many of these chemicals contributes to this concern.

In the case of a significant chemical spill event, after local resources are exhausted, the nearest Hazardous Incident Team is housed in North Platte, nearly an hour and a half away. This substantial distance, may exacerbate damages, compared to an area with closer chemical response resources. Local fire departments would be the first to respond to a hazardous materials spill.

Severe Thunderstorms

The local planning team identified severe thunderstorms as a top concern. The Deuel County planning team noted that the most common concerns for the county include hail damaging crops and flooding due to small culverts.

To prevent lasting impacts as a result of severe thunderstorms, the county budgets monies annually to repair culverts as needed. The planning team also indicated that improved awareness is needed.

Severe Winter Storms

The local planning team identified severe winter storms as a top concern. The Deuel County planning team indicated that being so close to a major transportation corridor (Interstate 80) can present unique demands during a severe winter storm, especially when the interstate has been closed. Often, I-80 either closes at Big Springs (20 miles east) or Sidney (25 miles west). During severe winter storms, power outages are common, according to the local planning team, 5-6 power outages annually are considered normal. Most of these power outages do not last for a full 24 hours. The worst power outage in recent history lasted seven full days and occurred in the 1990s. According to the planning team, extremely cold temperatures in February 2021 resulted in limited lodging availability for stranded travelers.

To prevent lasting impact as a result of severe winter storms, the county has invested in a generator for the City of Chappell's facility. Many residents have purchased their own portable generators to protect themselves from future power outages. The planning team identified that an action plan is needed for when the interstate and highways are closed.

Tornadoes

The local planning team identified tornadoes as a top concern. The local planning team indicated that tornadoes were a regular part of life in the planning area. According to the NCEI, Deuel County experienced 12 tornadoes from 1996 to April 2021, resulting in \$215,000 in property damage and \$12,000 in crop damage. The planning team noted that a pumping station for Black Hills Energy was destroyed previously due to tornado damage. For county employees, a vault in the courthouse has been designated as a storm shelter area. Most county residents have cellars or basements, which offer protection in the case of a high wind or tornado event. Both the courthouse and sheriff's department have weather radios. The fire departments perform storm spotting.

Mitigation Strategy

Continued Mitigation and Strategic Actions

Mitigation Action	Floodplain Management
DESCRIPTION	Continue or improve floodplain management practices such as adoption and enforcement of floodplain management requirements (regulation of construction in special flood hazard areas), floodplain identification and mapping (local requests for map updates), description of community assistance and monitoring activities, explanation for failure to participate in the National Flood Insurance Program, Community Rating System (CRS), and participation in Federal Emergency Management Agency's Cooperating Technical Partners Program (CTP) to increase local involvement in the flood mapping process
HAZARD(S)	Flooding
ESTIMATED COST	Staff Time
FUNDING	General Fund
TIMELINE	5+ years
PRIORITY	High
LEAD AGENCY	Floodplain Manager, Highway Department
STATUS	A county commissioner's meeting and a public hearing are planned to discuss project-related activities in the coming year.

Mitigation Action	Public Awareness and Education
DESCRIPTION	Outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards; conduct an annual storm spotter training; share information via the County Facebook page, as well as information regarding animal and plant disease through the UNL extension
HAZARD(S)	All Hazards
ESTIMATED COST	\$500
FUNDING	Annual Budget
TIMELINE	Ongoing
PRIORITY	Medium
LEAD AGENCY	County Commissioners, Region 21 Emergency Management
STATUS	No project-related activities are currently planned.

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Mitigation Action	Regulation Enforcement and Updates
DESCRIPTION	Continue to enforce local floodplain regulations for structures located in the 100-year floodplain; strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any community or county; continue education of building inspectors or Certified Floodplain Managers; encourage building regulations for storm-resistance structures
HAZARD(S)	Flooding
ESTIMATED COST	\$4,000+
FUNDING	Permit fees
TIMELINE	Ongoing
PRIORITY	Low
LEAD AGENCY	Floodplain Manager, Highway Superintendent
STATUS	No project-related activities are currently planned.

Mitigation Action	Safe Rooms
DESCRIPTION	Construct a fully supplied safe room at Creekside RV Campground and other locations as deemed necessary or advantageous.
HAZARD(S)	High Winds, Tornadoes
ESTIMATED COST	\$200-\$300/sq ft stand alone, \$150-\$200 addition/retrofit
FUNDING	Private Funding, HMA
TIMELINE	1 year
PRIORITY	High
LEAD AGENCY	Creekside RV Park
STATUS	This project has not yet started.

Mitigation Action	Stormwater System and Drainage Improvements
DESCRIPTION	Improve or replace culverts as they age or fail – drainage culverts facilitate the flow of water safely below roadways and convey runoff; culverts and drainage ditches will be repaired as needed and this is a regular expense
HAZARD(S)	Flooding
ESTIMATED COST	\$10,000-\$100,000
FUNDING	General Fund
TIMELINE	Ongoing
PRIORITY	Medium
LEAD AGENCY	County Commissioners
STATUS	This project has not yet started.

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Community Profile

Village of Big Springs

**South Platte NRD
Hazard Mitigation Plan 2022**

Local Planning Team

Table BGS.1: Big Springs Local Planning Team

Name	Title	Jurisdiction
Herman Krykland	Board Chair	Village of Big Springs
Curt Brown	Maintenance Superintendent	Village of Big Springs
Tamera Loomis	Village Clerk	Village of Big Springs

Location and Geography

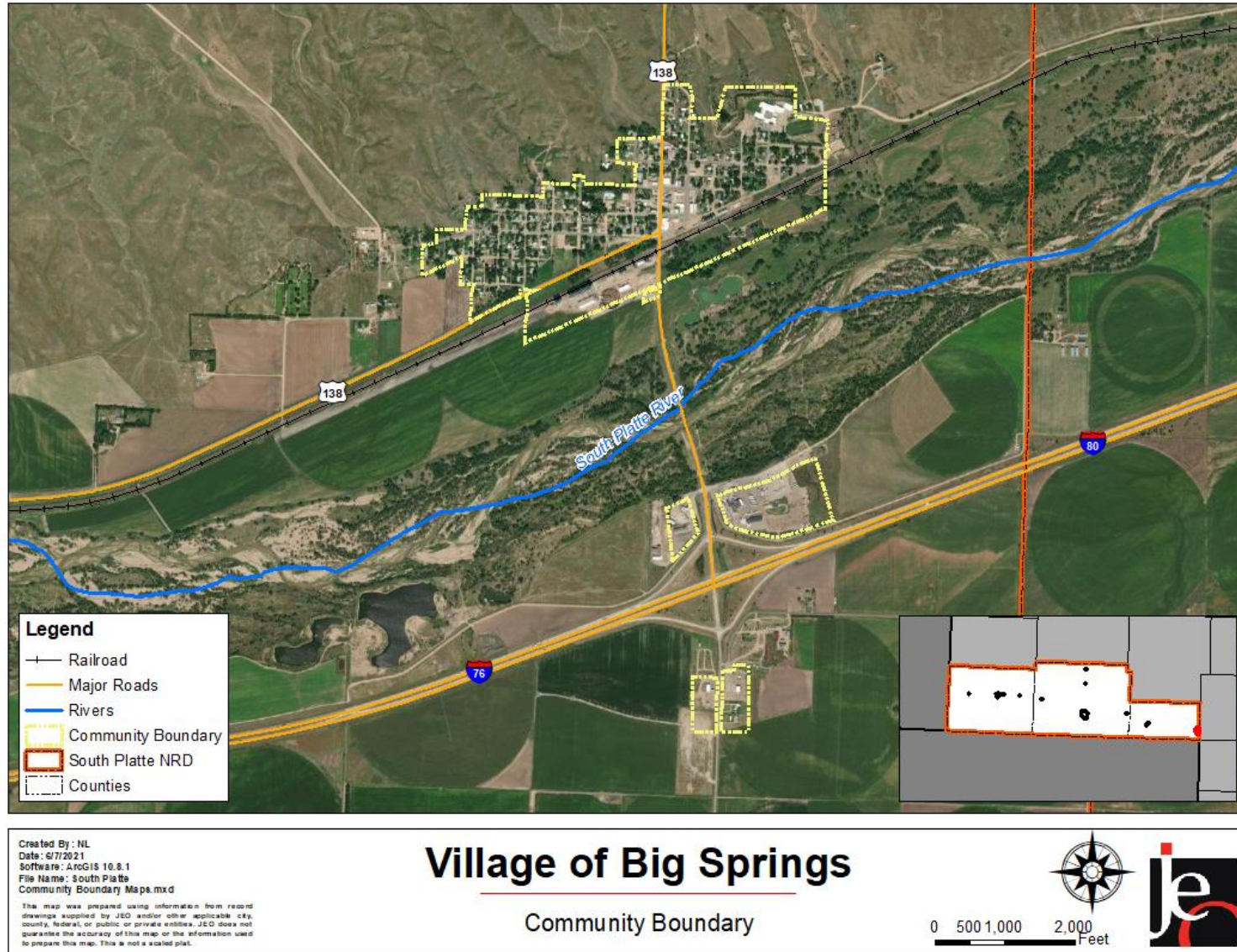
The Village of Big Springs is located in the eastern portion of Deuel County and covers an area of 0.44 square miles. The major waterway in the area is the South Platte River, which runs south of Big Springs.

Transportation

According to the Nebraska Department of Transportation, US Highway 138 runs north/south through Big Springs, and accommodates approximately 1,835 vehicles per day, 220 of which are heavy commercial vehicles.¹¹ The Union Pacific Railroad runs east/west along Big Spring's southern border.

¹¹ Nebraska Department of Transportation. 2020. "Interactive Statewide Traffic Counts Map." [map]. <https://gis.ne.gov/portal/apps/webappviewer/index.html?id=8ed4b009b0d546f19f0284e5bba0f972> .

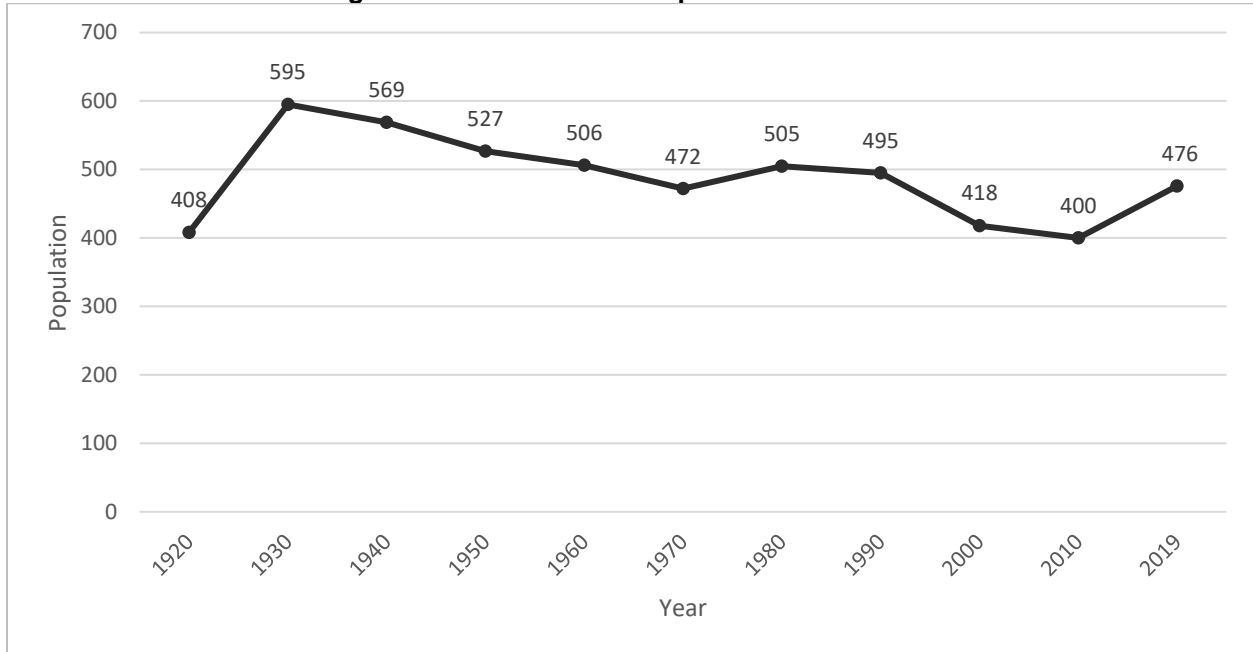
Figure BGS.1: Village of Big Springs



Demographics

Big Springs's estimated population in 2019 was 476. The following figure displays the historical population trend from 1920 to 2019. This figure indicates that the population of Big Springs declined from 1980 to 2010 but has since increased. Increasing populations are associated with increased hazard mitigation and emergency planning requirements for development. Increasing populations can also contribute to increasing tax revenues, allowing communities to pursue additional mitigation projects. Big Springs's population accounted for 26 percent of Deuel County's population in 2019.¹²

Figure BGS.2: Estimated Population 1920 – 2019



Source: U.S. Census Bureau¹³

The young, elderly, minorities, and poor may be more vulnerable to certain hazards than other groups. In comparison to the county, Big Springs's population was:

- **Younger.** The median age of Big Springs was 50 years old in 2019, compared with the county average of 48.7 years. Big Springs's population grew younger since 2010, when the median age was 50.6 years old. Big Springs had a greater proportion of people under 20 years old (21.5%) than the county (21.0%).¹⁴
- **Less ethnically diverse.** Since 2010, Big Springs's ethnic diversity decreased. In 2010, 7.0% of Big Springs's population was non-white. By 2019, 4.6% of Big Springs's population was non-white. During that time, those who were non-white in the county grew from 2.9% to 4.6%.¹⁵
- **More likely to be at the federal poverty line.** The poverty rate of all persons in Big Springs (9.3%) was higher than the county (8.8%) in 2019.¹⁶

¹² United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

¹³ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

¹⁴ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

¹⁵ United States Census Bureau. "2019 Census Bureau American Community Survey: DP05: ACS Demographic and Housing Estimates." [database file]. <https://data.census.gov>.

¹⁶ United States Census Bureau. "2019 Census Bureau American Community Survey: DP03: Selected Economic Characteristics." [database file]. <https://data.census.gov>.

Employment and Economics

The village's economic base is a mixture of industries. In comparison to Deuel County, Big Springs's economy had:

- **Similar mix of industries.** Employment sectors accounting for 10% or more of employment in Big Springs included: Agriculture, Retail Trade and Educational Services. Deuel County's employment sectors also included Agriculture, Retail Trade and Educational Services in 2019.¹⁷
- **Lower household income.** Big Springs's median household income in 2019 (\$44,792) was about \$3,000 lower than the county (\$47,287).¹⁸
- **Fewer long-distance commuters.** 46.4% of workers in Big Springs commuted for fewer than 15 minutes, compared with 50.3% of workers in Deuel County. 31.4% of workers in Big Springs commute 30 minutes or more to work, compared to 26.6% of the county workers.¹⁹

Major Employers

Major employers in Big Springs include the local grain elevator and the Flying J truck stop. According to the planning team, a large percentage of residents commute to other communities in Cheyenne County and Keith County.

Housing

In comparison to Deuel County, Big Springs's housing stock was:

- **Less owner occupied.** 73.0% of occupied housing units in Big Springs are owner occupied compared with 76.3% of occupied housing in Deuel County in 2019.²⁰
- **Newer housing stock.** Big Springs has a smaller share of housing built prior to 1970 (72.4%) compared to the county (81.5%).²¹
- **No multifamily homes.** The predominant housing type in the village is single family detached. Big Springs contains less multifamily housing with five or more units per structure compared to the county (0% compared to 2.0%). 85.6% of housing in Big Springs was single-family detached, compared with 87.6% of the county's housing. Big Springs has a larger share of mobile and manufactured housing (11.2%) compared to the county (5.0%).²²

This housing information is relevant to hazard mitigation insofar as the age of housing may indicate which housing units were built prior to state building codes being developed. Further, unoccupied housing may suggest that future development may be less likely to occur. Finally, communities with a substantial number of mobile homes may be more vulnerable to the impacts of high winds, tornadoes, and severe winter storms.

¹⁷ United States Census Bureau. "2019 Census Bureau American Community Survey: DP03: Selected Economic Characteristics." [database file]. <https://data.census.gov>.

¹⁸ United States Census Bureau. "2019 Census Bureau American Community Survey: DP03: Selected Economic Characteristics." [database file]. <https://data.census.gov>.

¹⁹ United States Census Bureau. "2019 Census Bureau American Community Survey: S0802: Means of Transportation to Work by Selected Characteristics." [database file]. <https://data.census.gov>.

²⁰ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

²¹ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

²² United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

Future Development Trends

Over the past five years, the village has lost a local grocery store and a local hardware store. There are currently no new housing developments planned for the next five years. However, a new gas station is planned for the south edge of the village.

Structural Inventory and Valuation

The planning team requested GIS parcel data from the County Assessor as of July 2021. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the following table.

Table BGS.2: Big Springs Parcel Valuation

Total Number of Improvements	Total Improvement Value	Number of Improvements in Floodplain	Value of Improvements in Floodplain	% of Improvements in Floodplain
255	\$20,167,065	19	\$2,869,380	7%

Source: County Assessor

Community Lifelines

Hazardous Materials – Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environment and Energy, there are nine chemical storage sites in Big Springs that contain hazardous chemicals. In the event of a chemical spill, the local fire department and emergency response may be the first to respond to the incident.

Table BGS.3: Chemical Storage Fixed Sites

Facility Name	Address
Ag Valley Co-op Non Stock	106 Pine St
Pilot Flying J 904	109 Circle Rd
McClung Aerial Spraying Inc	625 Road 207
CHS Inc	301 Pine St
TIGT Big Springs Station	19712 Highway 30
AT&T Communications 5090	County Road 2
CenturyLink	408 Pine St
NDOT Big Springs Yard	114 Frontage Rd
Hi-Line Co-op Inc	102 Pine St

Source: Nebraska Department of Environment and Energy²³

Critical Facilities

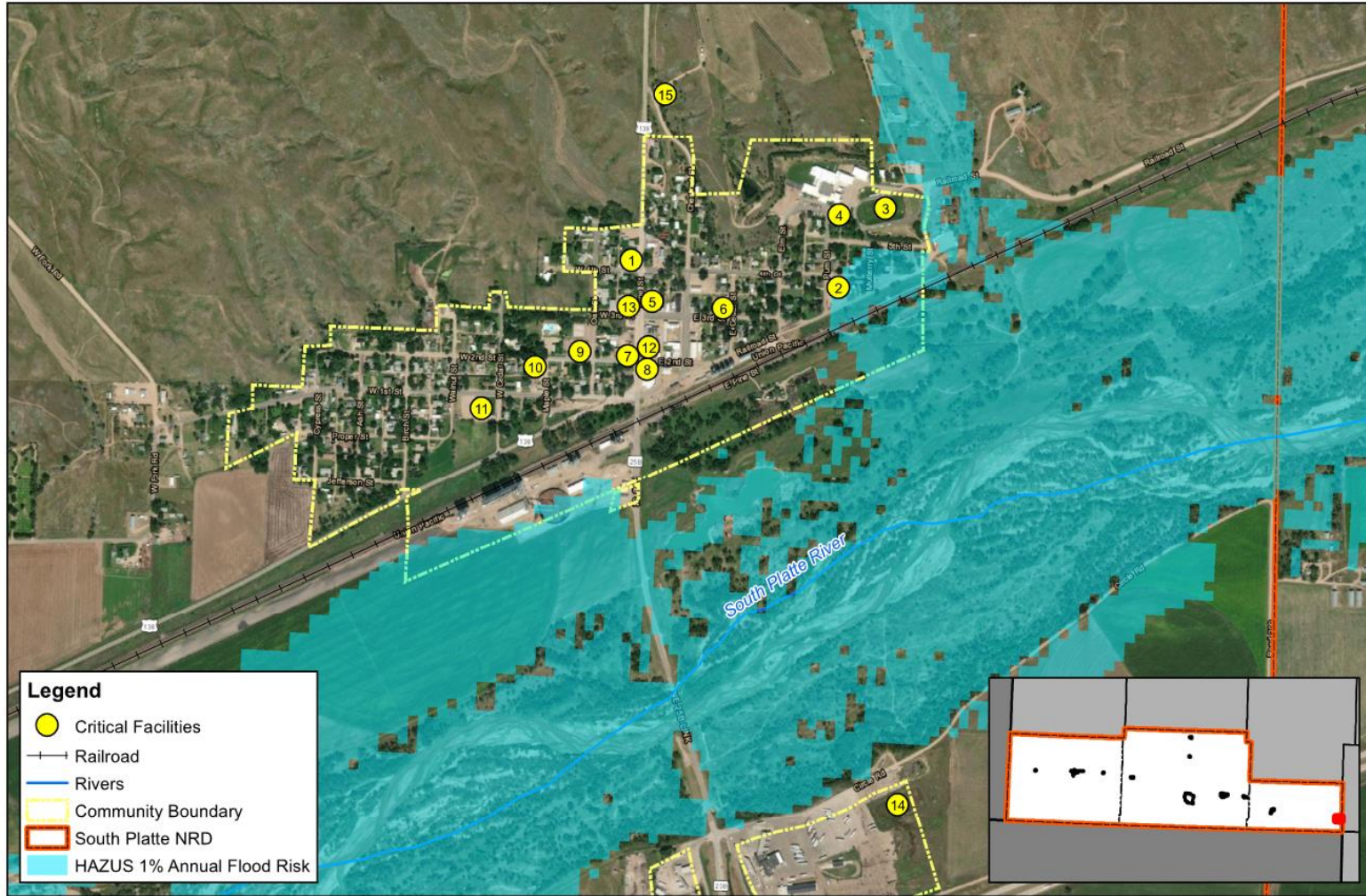
The local planning team identified critical facilities that are vital for disaster response, public shelter, and essential for returning the jurisdiction's functions to normal during and after a disaster per the FEMA Community Lifelines guidance. Critical facilities were identified during the original planning process and updated by the local planning team as a part of this plan update. The following table and figure provide a summary of the critical facilities for the jurisdiction.

²³ Nebraska Department of Environment and Energy. "Search Tier II Data." Accessed January 2021. <https://deg-iis.ne.gov/tier2/search.faces>.

Table BGS.4: Critical Facilities

CF #	Name	Shelter (Y/N)	Generator (Y/N)	Floodplain (Y/N)
1	Zion Lutheran Church	Y	N	N
2	County Maintenance Yard	N	N	Y
3	Football Field and Facilities	Y	N	N
4	South Platte Public School	Y	N	N
5	Fire Department	Y	N	N
6	United Methodist Church	Y	N	N
7	Library	N	N	N
8	Post Office	N	N	N
9	Park	N	N	N
10	Veteran's Memorial Area	N	N	N
11	Assembly of God	Y	N	N
12	Village Offices	N	N	N
13	Clinic	N	N	N
14	Sewer Treatment Plant	N	Y	N
15	Water Tower	N	Y	N

Figure BGS.3: Critical Facilities



Created By: KD
 Date: 12/15/2021
 Software: ArcGIS 10.8.1
 File Name: CF - SP Community Basemap.mxd

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plot.

Village of Big Springs

Critical Facilities


 0 250 500 1,000 Feet



Governance

A community's governance indicates the number of boards or offices that may be available to help implement hazard mitigation and strategic actions. Big Springs has a five-member Village Board and the following offices.

- Clerk/Treasurer
- Attorney
- Utility Superintendent
- Chief of Police
- Fire Chief
- Sewage Plant Operator
- Sewer/Water Commissioner
- Street Commissioner
- Park & Pool Commissioner
- Police & Animal Control Commissioner

Capability Assessment

The capability assessment consisted of a Capability Assessment Survey completed by the jurisdiction and a review of local existing policies, regulations, plans, and the programs. The survey is used to gather information regarding the jurisdiction's planning and regulatory capability; administrative and technical capability; fiscal capability; and educational and outreach capability.

Table BGS.5: Capability Assessment

Survey Components/Subcomponents		Yes/No
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Floodplain Administration	Yes
	GIS Capabilities	No
	Chief Building Official	No
	Civil Engineering	Yes

SECTION SEVEN: VILLAGE OF BIG SPRINGS COMMUNITY PROFILE

	Local Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Mutual Aid Agreement	No
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1 & 6 Year Plan	Yes
	Applied for grants in the past	No
	Awarded a grant in the past	No
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	No
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	Yes
	StormReady Certification	No
	Firewise Communities Certification	No
	Tree City USA	No
	Other (if any)	

Table BGS.6: Overall Capability

Overall Capability	Limited/Moderate/High
Financial resources needed to implement mitigation projects	Limited
Staff/expertise to implement projects	Moderate
Community support to implement projects	High
Time to devote to hazard mitigation	Limited

Plan Maintenance

Hazard Mitigation Plans should be living documents and updated regularly to reflect changes in hazard events, priorities, and mitigation and strategic actions. These updates are encouraged to occur after every major disaster event, alongside community planning documents (e.g., annual budgets and Capital Improvement Plans), during the fall before the HMA grant cycle begins, and/or prior to other funding opportunity cycles begin including CDBG, Water Sustainability Fund, Revolving State Fund, or other identified funding mechanisms.

The local planning team is responsible for reviewing and updating this community profile as changes occur or after a major event. The local planning team will include the Village Board Chair, Zoning Board, and TC Engineering. The plan will be reviewed bi-annually. The public will be included in the review and revision process via board meetings and website updates.

Plan Integration

Grants and Funding

The Village of Big Spring's funds are limited to maintaining current facilities and municipal systems. The amount of municipal funds has remained about the same in recent years. The city has not applied for any grants related to hazard mitigation in the last five years.

Building Codes (2018)

The building code sets standards for constructed buildings and structures. The village follows the 2018 International Building Code as adopted by the State of Nebraska.

Deuel County Local Emergency Operations Plan (2017)

The village has an annex in the Deuel County Local Emergency Operations Plan (LEOP). The LEOP establishes standardized policies, plans, guidelines, and procedures for emergency resources and governmental entities to respond and recover when a disaster event occurs. It contains information regarding direction and control, communications and warning, damage assessment, emergency public information, evacuation, fire services, health and human services, law enforcement, mass care, protective shelters, and resource management. This plan is updated every five years.

Western Sandhills Community Wildfire Protection Plan (2019)

The Nebraska Forest Service developed the Western Sandhills Community Wildfire Protection Plan (CWPP), which includes Deuel County, in October 2019. The purpose of the CWPP is to help effectively manage wildfires and increase collaboration and communication among organizations who manage fire. The CWPP discusses county specific historical wildfire occurrences and impacts, identifies areas most at risk from wildfires, discusses protection capabilities, and identifies wildfire mitigation strategies. This document will be updated every five years.

Historical Occurrences

See the Deuel County community profile for historical hazard events.

Hazard Prioritization

For additional discussion regarding area-wide hazards, please see *Section Four: Risk Assessment*. The hazards discussed in detail below were selected by the local planning team from the regional hazard list as the relevant hazards for the jurisdiction. The selected hazards

were prioritized by the local planning team based on historical hazard occurrences, potential impacts, and the community's capabilities.

Drought

The local planning team noted that the village experiences a drought about once every five years. The top concern for the planning team for drought is the economic impacts to the agricultural sector, which makes up a large part of Big Springs' economy. Extreme drought last occurred in the region in 2012/2013, according to the NCEI. Significant drought, however, was reported in 2020/2021.

Locally, the community generally defines drought as a lack of rain. The village does have water restriction ordinances which go into effect at a variety of trigger levels. To limit impacts of a drought event in town, the village has metered water usage, which allows for the monitoring of residential water use. Well drawdowns are also monitored. According to the planning team, the water supply has been sufficient since a new well was installed in 2009.

Flooding

Flooding was identified as a hazard of top concern for Big Springs. The local planning team indicated that there is particular concern for flooding along the South Platte River, which runs south of the village. The last significant flooding event in Big Springs occurred in 2013, when flooding occurred along the railroad tracks. This event resulted in the closure of two truck stops and a motel for 48 hours. There were also two injuries directly related to this event. Residents needed to sandbag low-lying areas to prevent flooding in town.

According to the HAZUS-MH generated floodplain, the village's sewer plant is partially located in the 1% annual chance floodplain. Approximately five percent of parcels are also within the floodplain, which represents about \$4,532,110. There is no record of municipally owned properties having been damaged by flooding in the past. According to the planning team, a risk assessment was completed in recent years. At this time, the community does not participate in the NFIP.

Hail

Like other communities across the planning area, the threat of property damage from hailstorms in Big Springs is very real. Hail events have caused damages to both municipal buildings and private property throughout the community; however, critical facilities have only sustained mild damage to roofs and siding. According to the NCEI, Big Springs has been affected by 70 hail events from 1996 to April 2021, with an average stone size of 1.3 inches in diameter. There were no injuries or deaths attributed to the 70 events; however, 16 of these events resulted in property damages totaling \$263,000. The local planning team noted that the last significant hail event happened in May 2019, when \$53,000 in property damage was sustained.

According to the Insurance Institute for Business and Home Safety, the most effective approach to mitigating hail impacts is upgrading roofing materials. Some residents of Big Springs have switched from asphalt shingles to metal roofs for the added protection they provide. The prevalence of metal roofing seems to be increasing and the local planning team expects that trend to continue.

Severe Winter Storms

Severe winter storms are a regular part of the climate and weather for Big Springs (and the planning area as a whole). According to the NCEI, there were 52 winter storm events in Deuel County from 1996 to April 2021. These events resulted in \$55,000 in property damages, with no injuries or deaths reported. Additionally, the USDA Risk Management Agency reported \$5.5 million in crop damages from severe winter storm events from 2000 to 2020. Extreme cold in February 2021 impacted the community with freezing water lines in some residences.

A significant concern identified by the local planning team is the drifting associated with even minor snow events. When the community has a mere 1 or 2 inches, there may be major drifts on roadways, depending on the direction and wind speed. Snow fences and wind blocks are utilized in some parts of the rural county but have proven to be of minimal benefit within the corporate limits of Big Springs. Presently, the community has sufficient resources for snow removal, including a truck with a blade and a road grader. The village maintenance worker takes care of primary roadways first, then clears side streets. Approximately 10% of power lines in the village are buried underground.

For awareness, the community members turn to social media, TV, and radio outlets for their information. For critical facilities, however, the addition of weather radios has been identified as a mitigation action that would allow for greater awareness in these facilities during severe weather events.

Tornadoes

Tornadoes were identified as a hazard of top concern for the community. The NCEI reports that seven tornadoes have occurred in Big Springs from 1996 to April 2021, resulting in \$145,000 in property damage. The most recent tornado occurred in 2018 and was categorized as EF 1. This tornado caused \$125,000. In 2002 an F0 tornado touched down briefly near Big Springs. The event resulted in damages to outbuildings and overturned a center pivot irrigation system causing approximately \$20,000 in damages. No injuries or fatalities were reported to have resulted from these events. Like other communities in the planning area, Big Springs' concerns related to tornadoes is directly linked to the devastation they can wreak on both human life and structures, and the unpredictability associated with these events.

Big Springs has two tornado sirens in working condition. Most residents use their own basements to seek refuge from a tornado event (an estimated 85 percent of the residents have basements). Village employees at the village offices use interior rooms to seek refuge from tornado and high wind events. As a former police station, the village office has concrete block rooms which provide added protection from high wind events. For protection from tornadoes, the South Platte K-12 School has recently built hardened locker rooms for students. Weather radios are located at the fire hall and the fire department performs storm spotting for the community.

Mitigation Strategy

Continued Mitigation and Strategic Actions

Mitigation Action	Bank Stabilization
DESCRIPTION	Stabilize banks along streams and rivers; this may include, but is not limited to: reducing bank slope, addition of riprap, installation of erosion control materials/fabrics
HAZARD(S)	Flooding
ESTIMATED COST	\$10,000
FUNDING	Village General Fund
TIMELINE	2-5 years
PRIORITY	High
LEAD AGENCY	Maintenance Department
STATUS	This project has not yet started.

Mitigation Action	Public Awareness and Education
DESCRIPTION	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards; educate citizens on erosion control and water conservation methods
HAZARD(S)	All Hazards
ESTIMATED COST	\$500-\$1,000 annually
FUNDING	Village General Fund
TIMELINE	5+ years
PRIORITY	High
LEAD AGENCY	Village Clerk
STATUS	Public awareness and education efforts occur regularly and is an ongoing project.

SECTION SEVEN: VILLAGE OF BIG SPRINGS COMMUNITY PROFILE

MITIGATION ACTION	Weather Radios
DESCRIPTION	Conduct an inventory of weather radios at schools and other critical facilities and provide new radios as needed
HAZARD(S)	All Hazards
ESTIMATED COST	\$50
FUNDING	Village General Fund
TIMELINE	1 year
PRIORITY	High
LEAD AGENCY	Village Clerk, Region 21 Emergency Management
STATUS	This project has not yet started.

Mitigation Action	Well Head Protection Planning
DESCRIPTION	Develop a Well Head Protection Plan to limit/reduce ground water contamination of municipal water supplies
HAZARD(S)	Flood, Drought
ESTIMATED COST	\$20,000 - \$50,000
FUNDING	Village General Fund, Water Contingency Fund (NDEE)
TIMELINE	10 years
PRIORITY	Low
LEAD AGENCY	Water system operator, SPNRD
STATUS	This project has not yet started.

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Community Profile

City of Chappell

**South Platte NRD
Hazard Mitigation Plan 2022**

Local Planning Team

Table CHP.1: Chappell Local Planning Team

Name	Title	Jurisdiction
Ashlea Bauer	City Administrator/Clerk	City of Chappell
Geralyn Konruff	City Treasurer	City of Chappell
Todd Rust	City Utilities Superintendent	City of Chappell

Location and Geography

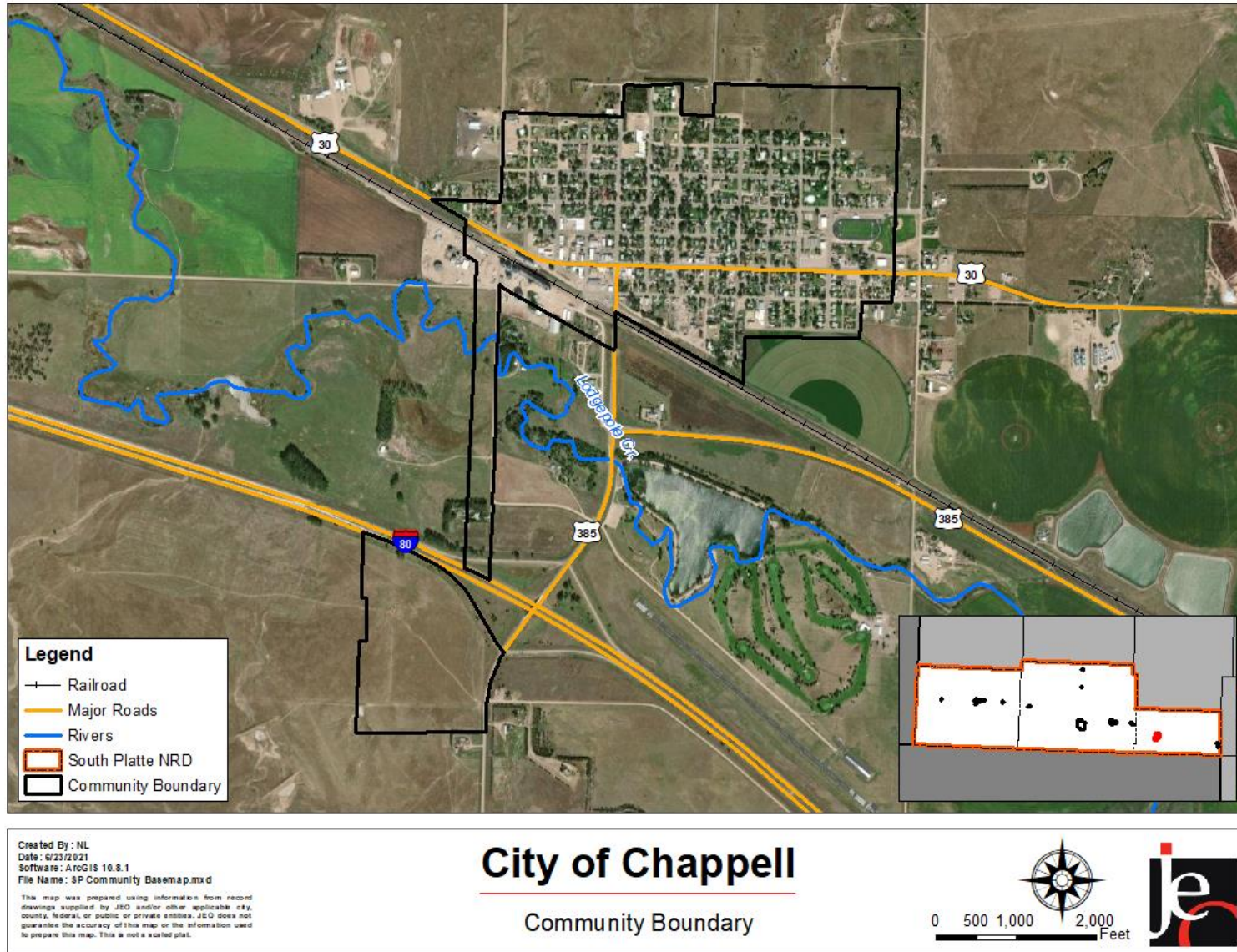
The City of Chappell is located in the western portion of Deuel County and covers an area of 0.7 square miles. The major waterway in the area is Lodgepole Creek, which runs just south of the village.

Transportation

According to the Nebraska Department of Transportation, US Highway 30 runs east/west through Chappell, and accommodates approximately 2,260 vehicles per day, 115 of which are heavy commercial vehicles. US Highway 385 runs north/south to the center of Chappell connecting with US Highway 30. US-385 accommodates approximately 1,325 vehicles per day, 135 of which are heavy commercial vehicles.²⁴ The Union Pacific Railroad runs east/west along Chappell's southern border. According to the local planning team, no significant transportation events have occurred locally in recent memory.

²⁴ Nebraska Department of Transportation. 2020. "Interactive Statewide Traffic Counts Map." [map]. <https://gis.ne.gov/portal/apps/webappviewer/index.html?id=8ed4b009b0d546f19f0284e5bba0f972> .

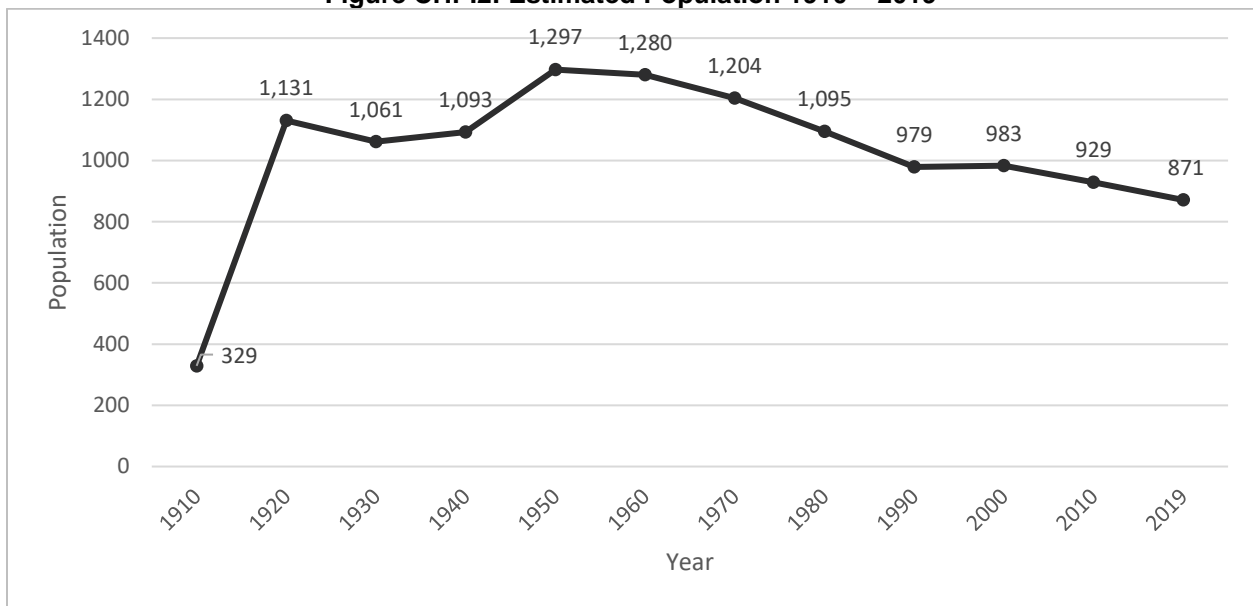
Figure CHP.1: City of Chappell



Demographics

Chappell's estimated population in 2019 was 871. The following figure displays the historical population trend from 1910 to 2019. This figure indicates that the population of Chappell has been steadily declining since 1950. This is notable for hazard mitigation because communities with declining population may also have a higher level of unoccupied housing that is not being up kept. Furthermore, areas with declining population may be less prone to pursuing residential/commercial development in their areas, which may reduce the number of structures vulnerable to hazards in the future. Decreasing populations can also represent decreasing tax revenue for the community which could make implementation of mitigation and strategic actions more fiscally challenging. Chappell's population accounted for 48 percent of Deuel County's population in 2019.²⁵

Figure CHP.2: Estimated Population 1910 – 2019



Source: U.S. Census Bureau²⁶

The young, elderly, minorities, and poor may be more vulnerable to certain hazards than other groups. In comparison to the county, Chappell's population was:

- **Older.** The median age of Chappell was 50.7 years old in 2019, compared with the county average of 48.7 years. Chappell's population grew older since 2010, when the median age was 46.6 years old. Chappell had a greater proportion of people under 20 years old (19.9%) than the county (21.0%).²⁷
- **More ethnically diverse.** Since 2010, Chappell's ethnic diversity decreased. In 2010, 1.7% of Chappell's population was non-white. By 2019, 3.3% of Chappell's population was non-white. During that time, those who were non-white in the county grew from 2.9% to 4.6%.²⁸

²⁵ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

²⁶ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

²⁷ United States Census Bureau. "2019 Census Bureau American Community Survey: S0101: Age and Sex." [database file]. <https://data.census.gov>.

²⁸ United States Census Bureau. "2019 Census Bureau American Community Survey: DP05: ACS Demographic and Housing Estimates." [database file]. <https://data.census.gov>.

- **More likely to be at the federal poverty line.** The poverty rate of all persons in Chappell (9.3%) was higher than the county (8.8%) in 2019.²⁹

Employment and Economics

The city's economic base is a mixture of industries. In comparison to Deuel County, Chappell's economy had:

- **Different mix of industries.** Employment sectors accounting for 10% or more of employment in Chappell included: Retail Trade, Professional Services, Educational Services, and Public Administration. Deuel County's employment sectors included Agriculture, Retail Trade and Educational Services in 2019.³⁰
- **Similar household income.** Chappell's median household income in 2019 (\$47,188) was about the same as the county (\$47,287).³¹
- **Fewer long-distance commuters.** 58.6% of workers in Chappell commuted for fewer than 15 minutes, compared with 50.3% of workers in Deuel County. 23.8% of workers in Chappell commute 30 minutes or more to work, compared to 26.6% of the county workers.³²

Major Employers

Major employers in the city include Creek Valley Schools and Frenchman Valley Farms Co-op. Some residents commute to other communities, such as Sidney, for work.

Housing

In comparison to Deuel County, Chappell's housing stock was:

- **Less owner occupied.** 75.1% of occupied housing units in Chappell are owner occupied compared with 76.3% of occupied housing in Deuel County in 2019.³³
- **Older housing stock.** Chappell has a larger share of housing built prior to 1970 (84.9%) compared to the county (81.5%).³⁴
- **More multifamily homes.** Although the predominant housing type in the city is single family detached, Chappell contains more multifamily housing with five or more units per structure compared to the county (4.2% compared to 2.0%). 84.9% of housing in Chappell was single-family detached, compared with 87.6% of the county's housing. Chappell has a smaller share of mobile and manufactured housing (1.8%) compared to the county (5.0%).³⁵ According to the planning team, mobile homes are located south of Highway 30, near 1st Street and Dana Avenue.

This housing information is relevant to hazard mitigation insofar as the age of housing may indicate which housing units were built prior to state building codes being developed. Further, unoccupied housing may suggest that future development may be less likely to occur. Finally, communities with a substantial number of mobile homes may be more vulnerable to the impacts of high winds, tornadoes, and severe winter storms.

²⁹ United States Census Bureau. "2019 Census Bureau American Community Survey: DP03: Selected Economic Characteristics." [database file]. <https://data.census.gov>.

³⁰ United States Census Bureau. "2019 Census Bureau American Community Survey: DP03: Selected Economic Characteristics." [database file]. <https://data.census.gov>.

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³³ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

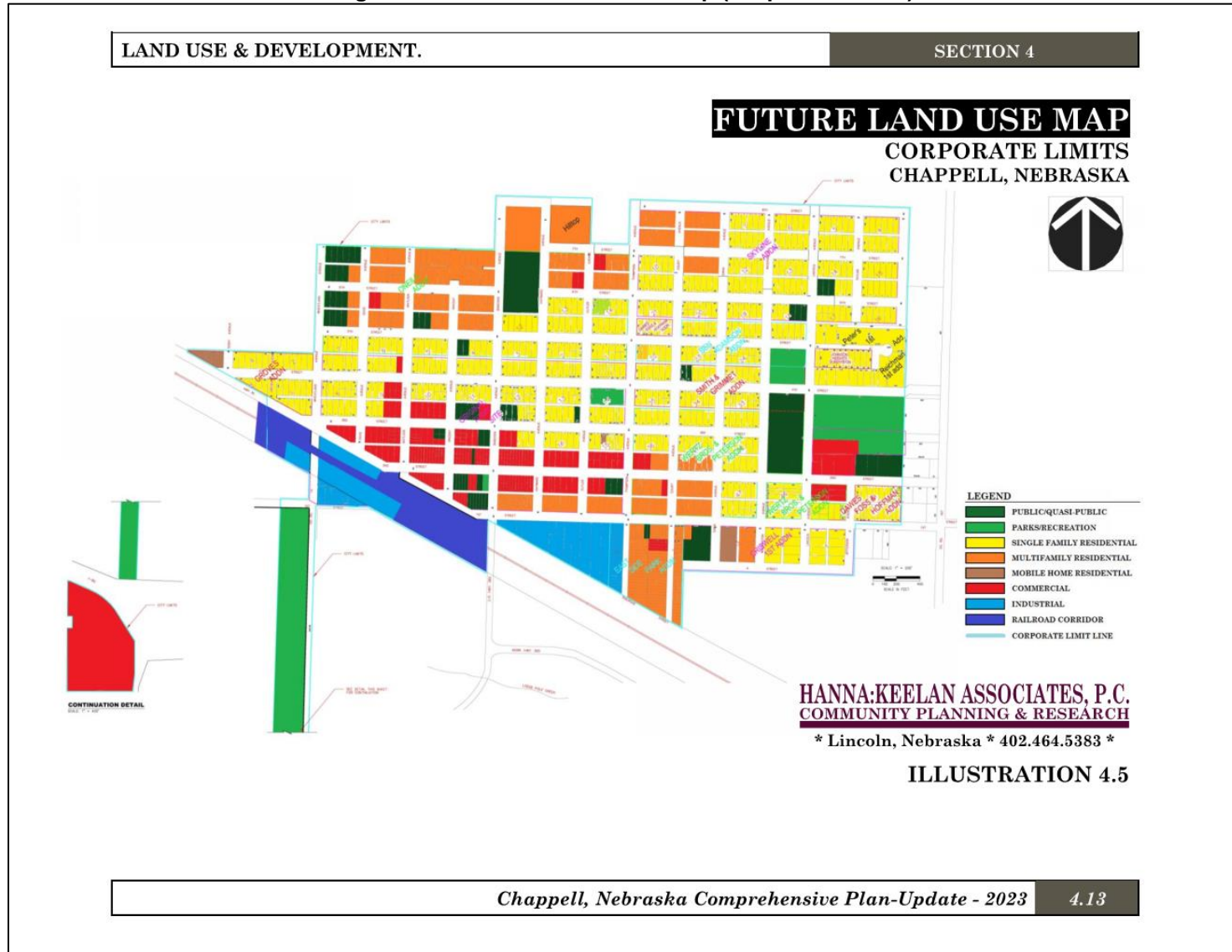
³⁴ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

³⁵ United States Census Bureau. "2019 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov>.

Future Development Trends

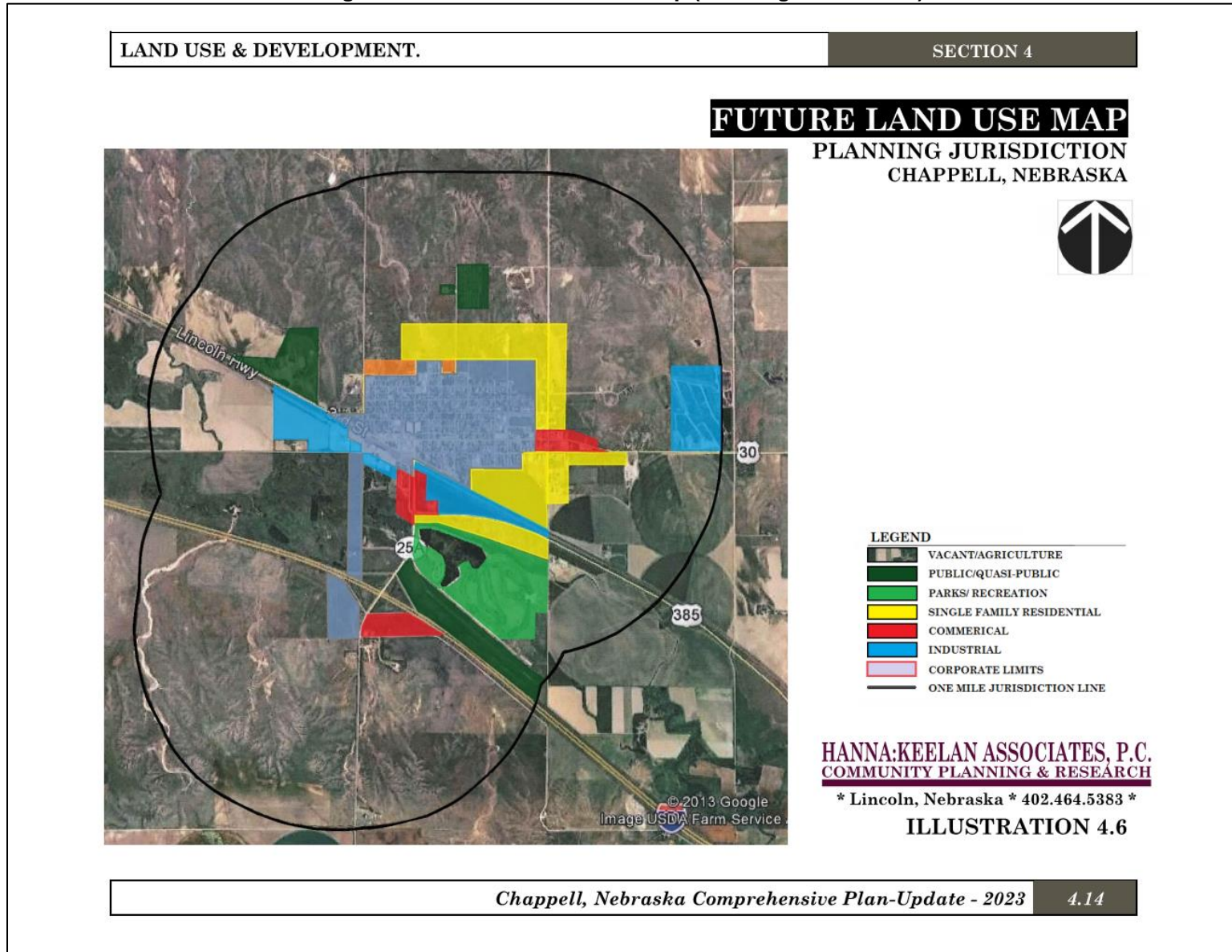
Over the past five years, the main development to occur in Chappell is the Frenchman Valley Farms Co-op expanding its facilities. Minimal houses have been for sale and a few buildings have been torn down during that time. According to census estimates, Chappell's population has decreased over the last few decades. The planning team attributes this to people passing away and fewer people moving to the community. There are no current plans for housing developments over the next five years, but a new fueling station has been discussed.

Figure CHP.3: Future Land Use Map (Corporate Limits)



Source: Chappell, Nebraska Comprehensive Plan-Update - 2023

Figure CHP.4: Future Land Use Map (Planning Jurisdiction)



Source: Chappell, Nebraska Comprehensive Plan-Update - 2023

Structural Inventory and Valuation

The planning team requested GIS parcel data from the County Assessor as of July 2021. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the following table.

Table CHP.2: Chappell Parcel Valuation

Total Number of Improvements	Total Improvement Value	Number of Improvements in Floodplain	Value of Improvements in Floodplain	% of Improvements in Floodplain
614	\$32,548,860	0	\$0	0%

Source: County Assessor

Community Lifelines

Hazardous Materials – Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environment and Energy, there are five chemical storage sites in Chappell that contain hazardous chemicals. In the event of a chemical spill, the local fire department and emergency response may be the first to respond to the incident.

Table CHP.3: Chemical Storage Fixed Sites

Facility Name	Address
Frenchman Valley Farmers Co-op	16515 Road 14
WAPA Chappell Substation	Thompson Ave
NDOT Chappell Yard	1450 Road 165
AT&T Microwave Tower 1360	18514 Road 14
NDOT 95 Reload Yard	815 Nebraska Highway 27

Source: Nebraska Department of Environment and Energy³⁶

Critical Facilities

The local planning team identified critical facilities that are vital for disaster response, public shelter, and essential for returning the jurisdiction's functions to normal during and after a disaster per the FEMA Community Lifelines guidance. Critical facilities were identified during the original planning process and updated by the local planning team as a part of this plan update. The following table and figure provide a summary of the critical facilities for the jurisdiction.

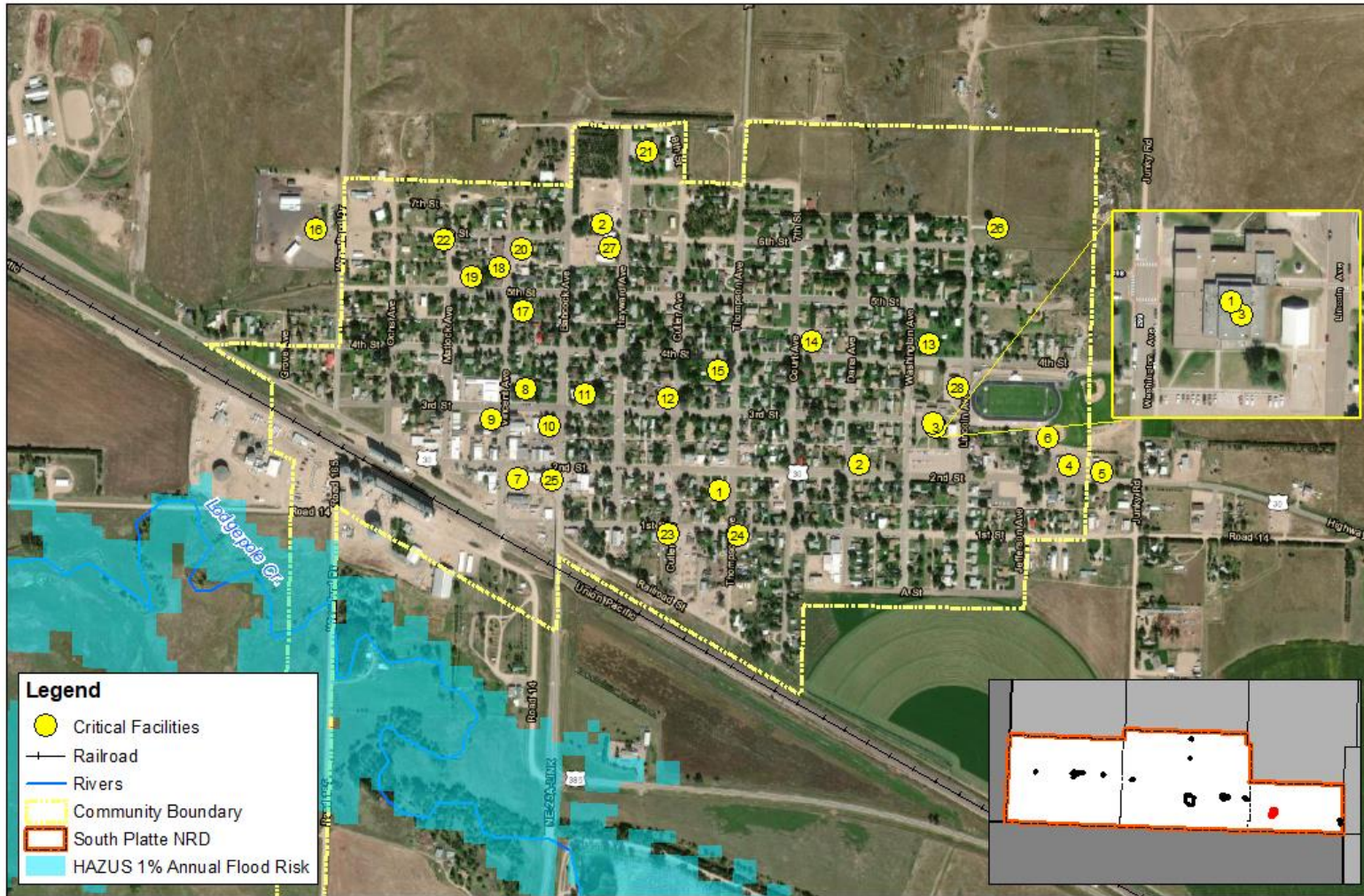
³⁶ Nebraska Department of Environment and Energy. "Search Tier II Data." Accessed January 2021. <https://deg-iis.ne.gov/tier2/search.faces>.

SECTION SEVEN: CITY OF CHAPPELL COMMUNITY PROFILE

Table CHP.4: Critical Facilities

CF #	Name	Shelter (Y/N)	Generator (Y/N)	Floodplain (Y/N)
1	St. Joseph's Catholic Church	N	N	N
2	Grace Lutheran	N	N	N
3	High School	Y	N	N
4	Fire Department	N	N	N
5	Lions Club	N	N	N
6	Sports Complex	N	N	N
7	Postal Office	N	N	N
8	County Courthouse	Y	Y	N
9	Elementary School	Y	N	N
10	Art Gallery	N	N	N
11	United Methodist	Y	N	N
12	School	Y	N	N
13	Pool & Park	N	N	N
14	Assembly of God	N	N	N
15	Park	N	N	N
16	Streets/Roads Department	N	N	N
17	Heritage House	N	N	N
18	Zion Lutheran Church	N	N	N
19	Medical Clinic	N	Y	N
20	Hilltop Manor Assisted Living	N	N	N
21	City Well #5	N	Y	N
22	City Well #4	N	N	N
23	City Well #3	N	Y	N
24	City Hall/Generation Facility	N	Y	N
25	Water Tower	N	N	N

Figure CHP.5: Critical Facilities



Created By : NL
 Date : 2/23/2022
 Software : ArcGIS 10.8.1
 File Name : CF - SP Community Basemap.mxd

This map was prepared using information from record drawings supplied by JEC and/or other applicable city, county, federal, or public or private entities. JEC does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plot.

City of Chappell

Critical Facilities

Governance

A community's governance indicates the number of boards or offices that may be available to help implement hazard mitigation and strategic actions. Chappell has a five-member city council and the following offices.

- Administrator/Clerk
- Treasurer
- Attorney
- Street Overseer
- Water Commissioner
- Ambulance Coordinators

Capability Assessment

The capability assessment consisted of a Capability Assessment Survey completed by the jurisdiction and a review of local existing policies, regulations, plans, and the programs. The survey is used to gather information regarding the jurisdiction's planning and regulatory capability; administrative and technical capability; fiscal capability; and educational and outreach capability.

Table CHP.6: Capability Assessment

Survey Components/Subcomponents		Yes/No
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	Yes (State)
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Floodplain Administration	No
	GIS Capabilities	No
	Chief Building Official	No
	Civil Engineering	No
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Mutual Aid Agreement	Yes
	Other (if any)	

SECTION SEVEN: CITY OF CHAPPELL COMMUNITY PROFILE

Fiscal Capability	Capital Improvement Plan/ 1 & 6 Year Plan	Yes
	Applied for grants in the past	No
	Awarded a grant in the past	No
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	Yes
	StormReady Certification	No
	Firewise Communities Certification	No
	Tree City USA	Yes
	Other (if any)	

Table CHP.7: Overall Capability

Overall Capability	Limited/Moderate/High
Financial resources needed to implement mitigation projects	Limited
Staff/expertise to implement projects	Moderate
Community support to implement projects	Moderate
Time to devote to hazard mitigation	Limited

Plan Maintenance

Hazard Mitigation Plans should be living documents and updated regularly to reflect changes in hazard events, priorities, and mitigation and strategic actions. These updates are encouraged to occur after every major disaster event, alongside community planning documents (e.g., annual budgets and Capital Improvement Plans), during the fall before the HMA grant cycle begins, and/or prior to other funding opportunity cycles begin including CDBG, Water Sustainability Fund, Revolving State Fund, or other identified funding mechanisms.

The local planning team is responsible for reviewing and updating this community profile as changes occur or after a major event. The local planning team will include the City Council, City Staff, and the Region 21 Emergency Manager. The plan will be reviewed annually. The public will be included in the review and revision process via council meetings, website updates, and social media.

Plan Integration

Chappell has several planning documents that discuss or relate to hazard mitigation. Each applicable planning mechanism is listed below along with a short description of how it is integrated with the hazard mitigation plan. The city will seek out and evaluate any opportunities to integrate the results of the current hazard mitigation plan into other planning mechanisms and updates.

Grants and Funding

The City of Chappell's funds are limited to maintaining current facilities and municipal systems. A portion of municipal funds are currently dedicated to a street repaving project. The amount of municipal funds has remained about the same in recent years. The city has not applied for any grants related to hazard mitigation in the last five years.

Capital Improvement Plan

The capital improvement plan outlines large purchases and projects that the city would like to pursue. Projects identified in the plan include: regular maintenance for drainage structures, regular maintenance for the storm sewer system, installing water meters for residential structures, and updating the electrical distribution system.

Comprehensive Plan (2013)

The comprehensive plan is designed to guide the future actions and growth of the city. It contains goals aimed at Safe Growth, limits density in areas adjacent to known hazardous areas, encourages infill development, identifies areas that need emergency shelters, and encourages preservation of open space in hazard-prone areas. The city plans to include a part about encouraging "clustering of development" in sensitive areas in a future plan update. The city plans to update the comprehensive plan in 2023 and will have the zoning/planning committee include mitigation measures into the plan.

Building Codes (2018)

The building code sets standards for constructed buildings and structures. The city follows the 2018 International Building Code as adopted by the State of Nebraska.

Zoning Ordinance (2013), Subdivision Regulations (2013), Water Drought/Emergency Ordinance (2006)

The city's zoning ordinance and subdivision regulations outline where and how development should occur in the future. These documents contain floodplain maps, require more than one foot of elevation above Base Flood Elevation in the floodplain, include well setback

requirements, and include the ability to implement water restrictions. In a future update, the city would like to add items to limit population density in the floodplain and identify floodplain areas as parks or open space. There is currently no timeline to update these regulations.

Wellhead Protection Plan (2012)

The purpose of a wellhead protection plan is to protect the public drinking water supply wells from contamination. It includes identifying potential sources of groundwater contamination in the area and managing the potential contaminant sources.

Deuel County Local Emergency Operations Plan (2017)

The city has an annex in the Deuel County Local Emergency Operations Plan (LEOP). The LEOP establishes standardized policies, plans, guidelines, and procedures for emergency resources and governmental entities to respond and recover when a disaster event occurs. It contains information regarding direction and control, communications and warning, damage assessment, emergency public information, evacuation, fire services, health and human services, law enforcement, mass care, protective shelters, and resource management. This plan is updated every five years.

Western Sandhills Community Wildfire Protection Plan (2019)

The Nebraska Forest Service developed the Western Sandhills Community Wildfire Protection Plan (CWPP), which includes Deuel County, in October 2019. The purpose of the CWPP is to help effectively manage wildfires and increase collaboration and communication among organizations who manage fire. The CWPP discusses county specific historical wildfire occurrences and impacts, identifies areas most at risk from wildfires, discusses protection capabilities, and identifies wildfire mitigation strategies. This document will be updated every five years.

Historical Occurrences

See the Deuel County community profile for historical hazard events.

Hazard Prioritization

For additional discussion regarding area-wide hazards, please see *Section Four: Risk Assessment*. The hazards discussed in detail below were selected by the local planning team from the regional hazard list as the relevant hazards for the jurisdiction. The selected hazards were prioritized by the local planning team based on historical hazard occurrences, potential impacts, and the community's capabilities.

Hail

Due to the occurrence of hailstorms in the past, the local planning team identified hail as a hazard of top concern for the city. Chappell is highly prone to hailstorms and experiences approximately four hail events per year. According to the NCEI, there were 110 hail events in Chappell from 1996 to April 2021. Hailstones from these storms ranged from 0.75 to 2.5 inches and resulted in \$265,000 in property damage and \$4,370,000 in crop damage.

The city has experienced hail damages in the past, including damage to the city office generator and roof. The roof was replaced in 2015, largely due to hail damages. The local planning team noted that the community has many flat-top buildings, which are especially vulnerable to hail events. To mitigate lasting impacts because of hail, the city has worked with the local housing authority to install carports for vehicles. To date, fifteen carports have been installed throughout

Chappell to protect homeowners' cars from hail events. Additionally, the city participates in Tree City USA, which necessitates the existence of a tree board. The tree board is responsible for cutting down dangerous limbs, so they do not fall during hail events.

Hazardous Materials – Transportation

Chappell sits within a mile and a half of Interstate 80. Additionally, Highway 30 runs directly through town, and often accommodates many trucks that carry chemicals. Liquid storage is frequently moved on railroad cars on the west side of town and is transferred using a fire hose. According to PHMSA, there have been two transportation-related chemical spills occur in Chappell between 1971 and January 2021. A large spill occurred in 1993 when a tanker truck left the interstate and crashed, spilling 5,900 liquid gallons of diesel fuel. No fatalities or serious injuries were reported from either spill.

Recently, the NDEE required the Chappell co-op, Frenchman Valley, to build berms surrounding the area for containment. Of further concern, any chemical spills which may occur in Chappell may infiltrate Lodgepole Creek, located just south of the community. The local fire department would be the first to respond to a spill; however, no one is currently trained in HazMat. The nearest HazMat team is located in Scottsbluff. The local fire chief and emergency management would request help from trained individuals if a spill were to occur.

High Winds

The local planning team identified high winds as a hazard of top concern for the community, mainly due to the potential for power outages. According to the NCEI, Deuel County experienced 43 high wind events from 1996 to April 2021, ranging from 40 to 74 mph. These events resulted in property damages totaling \$30,000. Additionally, the USDA Risk Management Agency reported \$1.5 million in crop damages from high wind events in the county from 2000 to 2020. The planning team noted that one high wind event in Chappell took out a power line when a large tree limb fell at 7th and Babcock Streets in July 2016.

According to the planning team, city maintenance staff has worked to be highly proactive in trimming trees and removing dangerous limbs. The city recently replaced battery backups for the existing sirens, which are activated by 911 Dispatch in Sidney and the community uses CodeRed opt-in messaging for event notifications. In the case of events which require a shelter location, the city offices use their evidence room and the courthouse as designated tornado shelters. There is currently no safe room located in the city.

Severe Thunderstorms

Severe thunderstorms are a regular part of the weather and the climate for Chappell and the planning area as a whole. A significant concern identified by the local planning team was lightning damage to trees, as well as flooding along Highway 30, South Court Avenue, and the middle of town (south of the cemetery). According to the NCEI, 25 severe thunderstorm events occurred in Chappell from 1996 to April 2021. These events resulted in \$42,500 in property damages and \$15,000 in crop damages. No injuries or deaths were reported.

The planning team noted that the community uses CodeRed opt-in messaging for event notifications. In the case of events which require a shelter location, the city offices use their evidence room and the courthouse as designated tornado shelters. Backup generators are located in the city power plant and two of the well houses. Approximately 20% of the city's power lines are buried underground.

Because Lodgepole Creek flows within Chappell, flooding issues may be a concern, especially for a Creekside RV campground in southern Chappell.

Severe Winter Storms

Severe winter storms are a regular part of the climate and weather for Chappell. Severe winter storms include blizzards, ice accumulation, extreme cold, heavy snow, and winter storms. These storms can cause power outages during bitterly cold temperatures, road closures, and economic impacts. According to the NCEI, there were 52 severe winter storm events in Deuel County from 1996 to April 2021. These events resulted in \$55,000 in property damages, with no injuries or deaths reported. Additionally, the USDA Risk Management Agency reported \$5.5 million in crop damages from severe winter storm events from 2000 to 2020. Extreme cold in February 2021 impacted the community but power loss did not occur.

The city is responsible for its own snow removal and the local planning team has assessed that snow removal is performed adequately by city staff, with roads usually cleared by 6:00 AM. The city street department has designated routes that are to be cleared first. The downtown business district is done first, then the roads to the schools, churches, and access to the ambulances and fire hall. The community does not rank ice as a significant concern due to proactive work by local resources in sanding intersections. In terms of detection, the community uses CodeRed opt-in messaging for weather event notifications.

Mitigation Strategy

Completed Mitigation and Strategic Actions

Mitigation Action	Wellhead Protection Planning
DESCRIPTION	Develop a Wellhead Protection Plan to limit/reduce ground water contamination of municipal water supplies
HAZARD(S)	Flood, Drought
STATUS	A Wellhead Protection Plan has been developed.

Continued Mitigation and Strategic Actions

Mitigation Action	Alert/Warning Sirens
DESCRIPTION	Perform an evaluation of existing alert sirens to determine sirens which should be replaced or upgraded; install new sirens where lacking and remote activation
HAZARD(S)	All Hazards
ESTIMATED COST	\$15,000+
FUNDING	Local funds
TIMELINE	2-5 years
PRIORITY	High
LEAD AGENCY	Region 21 Emergency Management, Fire Department, Police Department
STATUS	The city recently replaced battery backups for the existing sirens.

Mitigation Action	Public Awareness and Education
DESCRIPTION	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards; educate citizens on erosion control and water conservation methods
HAZARD(S)	All Hazards
ESTIMATED COST	\$500+
FUNDING	Local Funds
TIMELINE	5+ years
PRIORITY	High
LEAD AGENCY	City Clerk
STATUS	The city works with Region 21 Emergency Management to educate the public about hazards on a regular basis.