

City of Beatrice, Nebraska

Hazard Mitigation Plan

March, 2008



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NEMA FISCAL

Al Berndt
Assistant Director
Nebraska Emergency Management Agency
1300 Military Road
Lincoln, Nebraska 68508

Subject: **Review of the City of Beatrice, Nebraska, Local Multi-Hazard Mitigation Plan**

Dear Mr. ^{AL} Berndt:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and Part 78 - FMA Planning & the Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000, dated March 2004, revised November 2006 and June 2007.

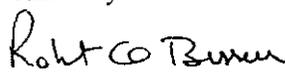
The Regional Office staff have reviewed the plan and provided the following comments.

| Local Jurisdiction | Date Submitted | Date Completed | Plan Review Type | Review Status | Date Final Approval |
|--------------------|----------------|----------------|--------------------------------|---------------|---------------------|
| City of Beatrice | April 8, 2008 | April 9, 2008 | <input type="checkbox"/> DMAZK | Approved | April 9, 2008 |
| | | | <input type="checkbox"/> FMA | Approved | April 9, 2008 |

Enclosed for your use is a copy of the above sited Local Mitigation Plan Review Crosswalk,

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely


Robert G. Bissell, Director
Mitigation Division

Enclosure:

RESOLUTION NO. 5017

WHEREAS, the Federal Disaster Mitigation Act of 2000 was signed in to law on October 30, 2000 placing new emphasis on state and local mitigation planning for natural hazards and requiring communities to adopt a hazard mitigation action plan to be eligible for pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, the City of Beatrice recognizes that no community is immune from natural hazards whether it be tornado/severe thunderstorm, flood, severe winter weather, drought, heat wave, earthquake, dam failure or wildfire and recognizes the importance of enhancing its ability to withstand natural hazards as well as the importance of reducing human suffering, property damage, interruption of public services and economic losses caused by those hazards; and

WHEREAS, a All Hazard Mitigation Task Force was developed by the City of Beatrice with representatives from the local police and fire departments, local building and zoning departments, local utilities departments, Lower Big Blue Natural Resources District, Nebraska Department of Natural Resources, Nebraska Emergency Management Association, and the local community to study the City of Beatrice's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating in the effects of such hazards on the community; and

WHEREAS, the efforts of the All-Hazards Mitigation Task Force, assisted by staff from JEO Consulting Group, have resulted in the development of a Hazard Mitigation Plan for the City of Beatrice; and

WHEREAS, FEMA regulations require documentation that the plan has been formally adopted by the governing body of the City of Beatrice in the form of a resolution and further requesting approval of the plan at the Federal Level; and

NOW, THEREFORE, BE IT RESOLVED, that the City Council and the City of Beatrice does hereby adopt the "Beatrice, Nebraska, Hazard Mitigation Plan" in its entirety; and

BE IT FURTHER RESOLVED, that the City Administrator of the City of Beatrice be and is hereby authorized and directed to certify copies of this resolution to FEMA and is hereby authorized and directed to request final approval of the "Beatrice, Nebraska, Hazard Mitigation Plan" meeting the requirements of the Federal Disaster Mitigation Act of 2000.

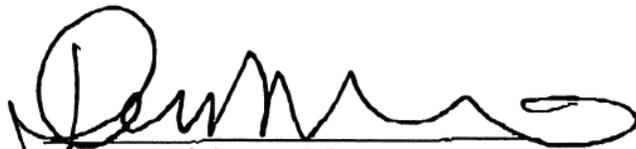
PASSED AND APPROVED this 3 day of March, 2008.



(SEAL)

Attest:


City Clerk


Dennis M. Schuster, Mayor

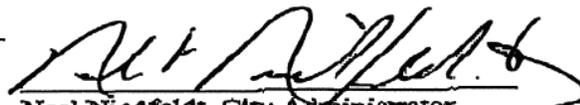

Neal Niedfeldt, City Administrator

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Section 1: Introduction

Purpose of the Plan

A Hazard Mitigation Plan is a blueprint for the future. It identifies hazards, assesses the losses associated with the hazards, and investigates the vulnerability of a town towards different hazards. Furthermore, a Hazard Mitigation Plan identifies alternatives for the future of the town to better prepare, minimize loss and educate the public of the hazards identified. The purpose of this plan is to fulfill local Hazard Mitigation Plan requirements. This plan will establish goals and objectives based on the identified hazards for the City of Beatrice and will select mitigation activities that are appropriate for the City. The ultimate goal is to build a sustainable community that can recover more quickly and sustain fewer losses when a natural or man-made disaster strikes.

The Disaster Mitigation Act of 2000 (DMA 2000) was passed as a result of escalating disaster costs that were occurring in the United States. The Act challenges cities to prevent damage from a disaster before the disaster hits. The intent of DMA 2000 is to facilitate cooperation between state and local authorities across a broad spectrum of mitigation activities. The act emphasizes the importance of pre-disaster mitigation planning and promotes sustainability as a strategy for disaster resistance.

The Act requires that local governments, in order to receive federal disaster mitigation funds, have in place a mitigation plan that describes the process of identifying hazards, risks and vulnerabilities. Furthermore, the plan identifies and prioritizes mitigation actions and encourages the development of local mitigation and that it provides technical support for these efforts. Consistent with the Federal Emergency Management Agency's (FEMA) planning process guidelines, the purpose of this plan is to accomplish the following objectives:

- Minimize the disruption to the City of Beatrice following a disaster.
- Put in place pre-identified actions that can be taken to reduce or eliminate future damage in order to make the disaster recovery process more efficient.
- Investigate, review and implement all possible activities to ensure all disaster related hazards are addressed by the most efficient and appropriate solution.
- Educate residents of Beatrice and nearby communities about potential hazards that pose a threat to the community.
- Fulfill planning requirements for future hazard mitigation project grants as described by DMA 2000.
- Facilitate development and implementation of hazard mitigation management activities to ensure a sustainable community.

Organization of the Plan

Section 1 – Introduction: This section introduces the Hazard Mitigation Plan. This section discusses the background and organization of the Beatrice Hazard Mitigation Plan along with its purpose and goals.

Section 2 – Planning Process: This section includes a description of the planning process. The discussion includes a description of the preparation of the plan, partners in planning, public involvement, and includes the resolution approving the plan.

Section 3 – Community Profile: This section covers the community profile including: location and geography, community history, population, developmental patterns, and climate.

Section 4 – Risk Assessment: This section contains discussion of the risk assessment. In the first part of this section, the methodology and results of the hazard identification are given. This is followed by discussion of the critical facilities and structural inventory. After this, each hazard identified is investigated with discussion on the hazard profile, historical occurrence, vulnerability assessment and potential losses.

Section 5 – Mitigation Strategy: This section contains mitigation strategies, first with discussion on the development of goals and alternatives, then with the goals and mitigation alternatives developed by the key personnel and the public.

Section 6 – Plan Implementation and Maintenance: In this final section of the report, a discussion and recommendation of the plan implementation and plan maintenance is included. Discussion includes the monitoring of the hazards, an advisory panel, annual review of the plan, and the process of updating the plan in the future.

Section 2: Planning Process

Preparation of the Plan

JEO Consulting Group, Inc. was hired by the City as an external consultant to write the plan and assist in the planning effort. At the initiation of the project in the fall of 2006, the City and JEO clearly defined the goals and objectives of the mitigation plan. The City of Beatrice, Gage County, Lower Big Blue Natural Resources District and Nebraska Department of Natural Resources also provided assistance during the planning process. Involved parties were selected based on knowledge of hazards, regulations and planning goals on both the local and state level.

Several key documents were identified to aid in the preparation of the plan, including the Comprehensive Development Plan for The City of Beatrice, the Beatrice Community Facts book, Beatrice Snow Emergency Plan, Gage County Local Emergency Operations Plan, and the Beatrice Drainage study. City regulations and ordinances were also referenced. The City also supplied various maps that display information about plats, paving, addresses, and emergency routes.

Planning Process

The City of Beatrice, NE has developed a local multi-hazard mitigation plan. The City of Beatrice was responsible for the development of the plan but hired JEO Consulting Group, Inc. as an external contributor and consultant to provide professional services for this planning project. JEO Consulting Group, Inc. provided the greatest assistance at collecting data and input for the development of the plan. The City of Beatrice provided them with key documents such as existing plans and reports. These are listed above in the "Preparation of the Plan" portion of Section 2. JEO Consulting Group also assisted in organizing public meetings and additional meetings. JEO Consulting Group, through the guidance of the City and the public, used the information to create this hazard mitigation plan.

Bob Feit, the Director of Administrative Services, with the City of Beatrice led the development of the plan at the staff level. A list of "Key Personnel" was developed at the onset of the planning process to get many entities to assist in the planning effort. Involved parties were selected based on knowledge of hazards, regulations and planning goals on both the state and local level. Key Personnel were initially contacted to help guide the development of the mitigation plan and to ensure participation of representatives from State government, and local City government offices. Key personnel were contacted at the initial phase of the project and invited to the first public meeting October 2nd, 2006 and one other time at the completion of the draft report on June 18th, 2007. However, the key personnel were kept informed, provided input and were included at all levels of the planning process. The key personnel also assisted in the public involvement process. The public meetings were held throughout the process to obtain input from attendants regarding community hazards, potential mitigation alternatives and implementation strategies. The plan was developed over the course of 16 months. Below a list of the key personnel and their affiliation is shown.

Beatrice Hazard Mitigation Key Personnel

Jim Bauer, City Administrator – City of Beatrice (Neal Niedfeldt will replace Jim Bauer in February 2008)

John Riggs, Building Inspector – City of Beatrice

Brian Daake, Fire Chief – City of Beatrice

Mark Hyberger, Director of Public Properties – City of Beatrice

Mark Meints, Director – Gage County Emergency Management

Rex Behrends, City Engineer – City of Beatrice

Sam Stevens, Citizen – Beatrice

Marlin Kliewer – Gage County Highway Department
Dale Kruse, Superintendent – Beatrice Public Schools
Chris Nelson, Citizen – Beatrice
Dennis Schuster, Mayor – City of Beatrice
Phil Cook, Beatrice City Council – City of Beatrice
Susan Witulski, Beatrice City Council – City of Beatrice
Alan Fetty, Beatrice City Council – City of Beatrice
Ted Fairbanks, Beatrice City Council – City of Beatrice
Rich Kerr, Beatrice City Council – City of Beatrice
Dwight Parde, Beatrice City Council – City of Beatrice
Pede Catlin, Beatrice City Council – City of Beatrice
Gary Lytle, Beatrice City Council – City of Beatrice
Don Vetrovsky, Board of Public Works – City of Beatrice
Linda Clabaugh, Board of Public Works – City of Beatrice
Richard Calhoon, Board of Public Works – City of Beatrice
Ron Fleecs, Board of Public Works – City of Beatrice
Ron Sutter, Board of Public Works – City of Beatrice
Shirley Gronnewold, Gage County Board of Supervisors
Harlan Hagemeyer, Gage County Board of Supervisors
Allen Grell, Gage County Board of Supervisors
Gary Barnard, Gage County Board of Supervisors
Rex Adams, Gage County Board of Supervisors
David Anderson, Gage County Board of Supervisors
Lawrence Gronewold, Lower Big Blue NRD
Orlaee Zimmerman, Lower Big Blue NRD
James Damrow, Lower Big Blue NRD
Wilmer Schlake, Lower Big Blue NRD
Harold Stokebrand, Lower Big Blue NRD
Dave Clabaugh – Lower Big Blue NRD
Richard Jiskra – Lower Big Blue NRD
Rodney Skleba – Lower Big Blue NRD
Robert Lorenz – Lower Big Blue NRD
Ronald Wiens – Lower Big Blue NRD
Dean Roehr – Lower Big Blue NRD
Steve Kelley – Lower Big Blue NRD
Kenneth Brockman – Lower Big Blue NRD
Lori Moore, State Hazard Mitigation Officer – Nebraska Emergency Management Agency
Steve McMaster, Natural Resources Planning Coordinator - Nebraska Department of Natural Resources (NDNR)

Public Involvement

Hazard mitigation plans seek to identify and address potential hazards. Local officials and members of the public can provide invaluable insight into the hazards faced by the community. They are the ones who experience hazards first hand. Local officials and the general population also have good ideas for mitigation alternatives. For these reasons, public involvement is essential to the effectiveness of such a plan.

The involvement of the public was made a high priority during the planning process. Two public meetings were held: one at the beginning on October 2nd, 2006 and one after the draft report was completed on June 18th, 2007. The public were also invited to attend appropriate City Council Meetings to provide input in the planning process. These meetings were posted at least two weeks in advance at several locations around town, at City Hall, on the City's website, and in the Beatrice Daily Sun a regionally distributed newspaper distributed to the following towns in southeastern Nebraska and Kansas: Adams, Barnston, Beatrice, Blue Springs, Clatonia, Cortland, Daykin, Dewitt, Diller, Fairbury, Filly, Hanover - Kansas, Maysville – Kansas, Odell,

Pawnee City, Pickrell, Plymouth, Steinauer, Sterling, Summerfield – Kansas, Swanton, Tecumseh, Virginia, Western, Wilber, and Wymore. In this way, neighboring communities, agencies, business, academia, and non-profits were given an opportunity to be involved in the planning process. Furthermore the public was encouraged to contact the City at any time to provide input. The objectives of public involvement was to gain input on the presence, frequency, severity, and history of hazard events and to provide input as to how the plan should be shaped, what goals and objectives should be included, and what sorts of alternative actions could be taken to reduce the impacts of hazard events. Public input was deemed valuable in creating and developing the hazard mitigation plan.

Meetings generally consisted of open discussions, question/answer sessions, and worksheets. Each served as a tool to gather input from members of the public and key personnel. Upon completion of each meeting, the results were documented thoroughly. Refer to Appendix B for the results and documentation of the public meetings. Included in Appendix B are notes and documents from meetings, public meeting handouts, meeting summaries, announcements, newspaper articles, meeting sign in sheets, and the Priority Score Tally used for ranking alternatives as discussed later in this plan.

Methodology

The methodology used for the development of the Beatrice Hazard Mitigation Plan included the following activities:

1. Coordination with other agencies or organizations
2. Identification of key personnel to be involved in the planning process
3. Public involvement
4. Structural inventory
5. Hazard identification
6. Review and analysis of possible mitigation activities
7. Local adoption and public hearing
8. Periodic review and update

The first activity was coordination with other agencies and organizations to initiate the Beatrice Hazard Mitigation Plan. The NDNR, Lower Big Blue NRD, NEMA and JEO Consulting Group, Inc became involved with the planning process. The development of key personnel came next. The key personnel were contacted by JEO Consulting Group and the City of Beatrice and were gathered for the initial public meeting to determine what hazards are present and what risk is there for each hazard. Documents from these meetings are in Appendix B, and the process is further described in Section 4: *Risk Assessment*. A hazard mitigation plan is a publicly guided document. With this in mind, the public was involved at the beginning of the development of this plan and continued to provide input throughout the process.

After this, information was collected and processed. This included a review of existing reports and studies; a structural inventory to get a clear picture of the types and numbers of structures in Beatrice; the investigation and development of hazard profiles, historical occurrences of hazards, the vulnerability of Beatrice towards each hazard, and calculations of potential losses that are associated with the hazards. Along with this, a community profile was completed to include the location, geography, history, climate, population and developmental patterns of the City of Beatrice. At this point in the planning process, the report was written by JEO Consulting Group and then was presented to key personnel and at the second public meeting. The key personnel, with the guidance of the public at the second public meeting, used information to review and revise the plan, develop goals, objectives and mitigation alternatives for the City of Beatrice, and prioritize the mitigation alternatives. These alternatives were prioritized using the STAPLEE process and this process is further described in Section 5: *Mitigation Strategy*. The alternatives were also linked to goals and objectives. At this stage in the planning process the plan was revised and was presented to the City of Beatrice for a public hearing and adoption. The City of

Beatrice adopted the plan on March 3rd, 2008 during a City Council meeting. With this adoption came the commitment to periodically review and update the plan every five years. In addition, the plan will be updated as deemed appropriate when a hazard event occurs that significantly affects the City of Beatrice. In Appendix D are worksheets that the City can use to assist in updating the plan.

Resolution Approving the Plan

As a requirement, a hazard mitigation plan must be formally adopted by the local governing body, in this case, the City of Beatrice. The adoption by the local governing body legitimizes the plan. It shows the full commitment of the jurisdiction to fulfill the goals and objectives in the plan. Adoption by the City of Beatrice further authorizes the appropriate responsible agencies to perform their responsibilities.

The City Council reviewed and adopted the plan on March 3rd, 2008. The adopting resolution is included on the first page of this plan.

Section 3: Community Profile

In the process of developing and refining a Hazard Mitigation Plan and more specifically, risk assessment and mitigation alternatives, it is important to understand the community and its profile. Knowing the community, its profile and what their vision is for the future is essential in assessing and planning for hazards that occur. This section discusses the community profile for the City of Beatrice and includes discussion on location and topography, history, population and demographics, developmental patterns, and climate. Most of the information in this section is from the Beatrice Community Facts book, the Comprehensive Development Plan for Beatrice, and the local Librarian and Historian, Laureen Riedesel.

Location and Geography

Beatrice is located in the southeastern part of Nebraska. It is located at the center of Gage County, of which it is the county seat. Beatrice is located 39 miles south of Lincoln, 99 miles southwest of Omaha, and 179 miles northwest of Kansas City. The City is located at the intersection of Nebraska State Highway 4 and U.S. Highways 77 and 136.



Figure 1. Location of Beatrice, NE
Source: Mapquest.com

Beatrice is located in the fertile valley of the Big Blue River, and the terrain in the immediate area is level to gently rolling. The soil type in the area is predominantly silty clay loam. Beatrice is 1,318 feet above sea level. The Big Blue River and Indian Creek run through the City of Beatrice. The Big Blue River generally runs from the northwest to southeast. There is a meander in the river that generally surrounds the downtown area. Indian Creek runs in a north-northeast to south-southwest direction, crossing North 6th Street north of Dorsey Street and joins the Big Blue River north of the bridge across Court Street.

Community History

Beatrice was founded in 1857, three years after Nebraska was officially organized as a Territory eligible for settlement. At the time of its founding, there was no town any further west located on the south side of the Platte River until a traveler arrived at the “village” of camp followers

connected to Fort Kearny. As a result, Beatrice was the last location for civilian justice for over 100 miles. The 1861 trial of Wild Bill Hickok for the murder of David C. McCanles was held in the first cabin constructed in Beatrice because that was the nearest court of law available.

The site for Beatrice was chosen because of the natural ford on the Big Blue River that was readily available in addition to the abundance of game, richness of soil and natural beauty. The area also boasted old growth hardwood trees, natural springs and artesian wells, clay deposits for bricks and limestone for quarrying. Three years after its founding, Beatrice boasted a population of 85.

A trail that had already been established from Brownville (the oldest incorporated town in Nebraska) to Fort Kearny was located to the north of Beatrice. With its settlement, the route was relocated to Beatrice and became known as the DeRoin Trail. From Beatrice it joined the Oregon Trail near the Alexandria, Nebraska area. This was the easiest, most direct route to Fort Kearny (by boat to Brownville, by wagon west.) This old route is now Highway 136 into Beatrice and Highway 4 through Homestead National Monument as it extends to the west. (This old freight road is one of the reasons for the selection of this first Homestead location by Daniel Freeman in 1862.) These highways continue to be used today as southern alternatives to Interstate 80. The Brownville connection is still important due to the location of the Cooper Nuclear Station in that community. Highway 136 was once known as the Goldenrod Highway, then Highway 3 before being renumbered as a federal highway.

Originally the road leaving Beatrice went either northeast to Nebraska City or northwest to the Crete area. This changed after 1867 when Lincoln was established as the new State Capital. The first Courthouse was built along this new street in 1870. The site was moved from its original planned location on the road to Brownville. The road to Lincoln became known as Cornhusker Highway and then U.S. Highway 77. It is now a four-lane road connecting Beatrice to Interstate 80 in Lincoln. It has been renamed in honor of the Homestead. It is also a route that still passes directly through Beatrice. Highway 77 and 136 cross at the center of Beatrice at 6th and Court Streets. Whatever is traveling along these routes is brought right into the heart of the historic downtown area.

Beatrice was formally platted and established as a City of the Second Class in 1872. Its population was over 625. This coincided with the arrival of the first railroad in the community, a line that ultimately became associated with the Burlington line. Within the next 20 years, it was joined by the Union Pacific and the Rock Island railroads. At the present time only the original Burlington tracks are still used during the harvest season.

In 1874 Beatrice established building codes to replace the original wooden downtown buildings with stone or brick structures. Town officials began enforcing early fire code standards. The community also had a number of volunteer firefighters. This resulted in the loss of individual buildings rather than whole blocks. The conflagrations that characterized many early frontier settlements were never a reality for Beatrice. Early accounts describe many lightning strikes as people built on the prairie. Although fires resulted, they were controlled without damage to other structures. Presently, the oldest buildings in the downtown area are limestone buildings dating from the early 1870s. Much of the historic building stock in downtown Beatrice dates from this period from the 1870s to the 1890s.

From the 1870s onward, Beatrice was home to many agriculturally-based manufacturing businesses. These included water pumps, windmills, cornhusking hooks, hay balers, barbed wire, along with a creamery (that would later become the multi-national Beatrice Foods Corporation) and a canning factory. This provided complementary jobs in the local economy.

In 1885 the earliest form of the Beatrice State Developmental Center was established on 40 acres donated for that purpose northeast of Beatrice. Since this institution provided 24/7 care from the start, it provided both jobs and housing for many employees. Over the years this has

grown to be the largest employer in the community. Although it is still outside city limits, fire services are provided by the City of Beatrice.

Beatrice's first hospital was founded by a local doctor in 1899. The Mennonite Church founded a hospital in 1911 and the Lutherans followed with one of their own in 1913. But since the early 1980s there has been only one organization: the Beatrice Community Hospital. However, the hospital facility and the extended care and assisted living facility are two separate buildings.

Due to its diverse economy, Beatrice survived the Depression of the 1930s with its local banks intact. During the 1930s, the first of two natural gas pipelines was constructed immediately outside the Beatrice city limits. The original homestead of Daniel Freeman was purchased by the Federal Government and made Homestead National Monument of America in honor of the 1862 Homestead Act and its impact on the nation and the world.

Beatrice's strong manufacturing base provided the opportunity for war-related jobs from 1941-1945. The first contracts were received from the Department of the Navy months before the formal declaration of war in December. The six major manufacturers in the area incorporated as Homestead Industries and made unified bids in order to be awarded government contracts. These manufacturers received awards for production and bond sales throughout the war.

In 1946 the Beatrice Municipal Airport was dedicated. It is a general aviation airport located on the north edge of Beatrice.

In the late 1950s and early 1960s Beatrice began to actively seek to bring manufacturers to the community to provide employment opportunities beyond what was available through the "home-grown" ones. Two large chemical companies located plants west of the community. The Martin Luther Home (now Mosaic) was moved from a neighboring town to a campus in southeast Beatrice. This added more employment opportunities in a community that was already serving 100s of developmentally disabled. Currently, there is a large Bio-Diesel Plant being constructed on the outer edge of Beatrice, Beatrice Biodiesel, LLC. This is a \$52.5 million facility that will produce 50 million gallons of ethanol per year, and will be the largest of its kind in the United States to date.

By the late 1960s, Beatrice had realized another dream – its own college. Pershing College, a private 4-year institution, was established west of Beatrice. By the mid 1970s it had become part of the state-funded Southeast Community College and continues in that role at the present time.

In the early 1980s several new industries located in Beatrice and an industrial park was opened on the north edge of Beatrice near the airport. This was so successful that a second and third addition have been opened.

The 1990s brought a group of new buildings: a public library, Senior Center, an addition to the YMCA and new High School.

Population

As of the 2000 Census, the total population of Beatrice was 12,496 persons. Beatrice has seen fairly steady growth over the past 100 years, but it has not always been like that. Beatrice was founded in 1857, and in 1860 the estimated population of Beatrice was 85. By 1870, the U.S. Census, as reported in P.D. Pyle's *An Early History of Beatrice, Nebraska*, indicated 624 people. By 1880, there were 2447 people. The 1880s and early 1890s were the "boom years" for Beatrice. The nearly 2500 people in 1880 had officially become 13,826 in the 1890 census. It is believed that about 11,000 is a more accurate population count for 1890, but the 1890 Federal Census burned and cannot be rechecked. Following the Panic of 1893, Beatrice experienced its first real economic downturn. By 1900, the population had dropped to 7,875. It took until 1960 for the population to once again exceed 12,000.

Beatrice did continue to grow steadily from the 1900s through the Great Depression and by 1940, the population had reached 10,883. After proving steady growth through the 1920's and 30's, Beatrice continued to grow up until 1980. In the 1980's, there was a slight decline when the population went from 12,981 in 1980 to 12,354 in 1990.

In the 1990's, Beatrice was successful at attracting young adults back into the community to begin careers and families. The 2000 census shows an increase in population of 142 persons. This correlates to a 3% migration rate during the 1990's. However, construction activity during the 90's indicates a very aggressive growth pattern. From 1990 to 2000, Beatrice experienced a construction rate of about 52 units annually. As noted in the *Comprehensive Development Plan for the City of Beatrice*: "this rate of construction would have indicated a higher 2000 population for the City than has been sited by the initial Census numbers and is more likely to reflect what was really happening in the City over the last ten years."

The Beatrice Plan also indicates that if Beatrice can sustain this level of construction activity, the City's population should increase by 1,340 every ten years. When added to the 0% migration scenario (births minus deaths) the City will experience a 2010 population of 13,281 and a 2020 population of 14,491.

Figure 2 shows the rise and decline of the population in Beatrice and Gage County since 1900. It can be seen that Beatrice has gradually grown in population while Gage County has substantially declined.

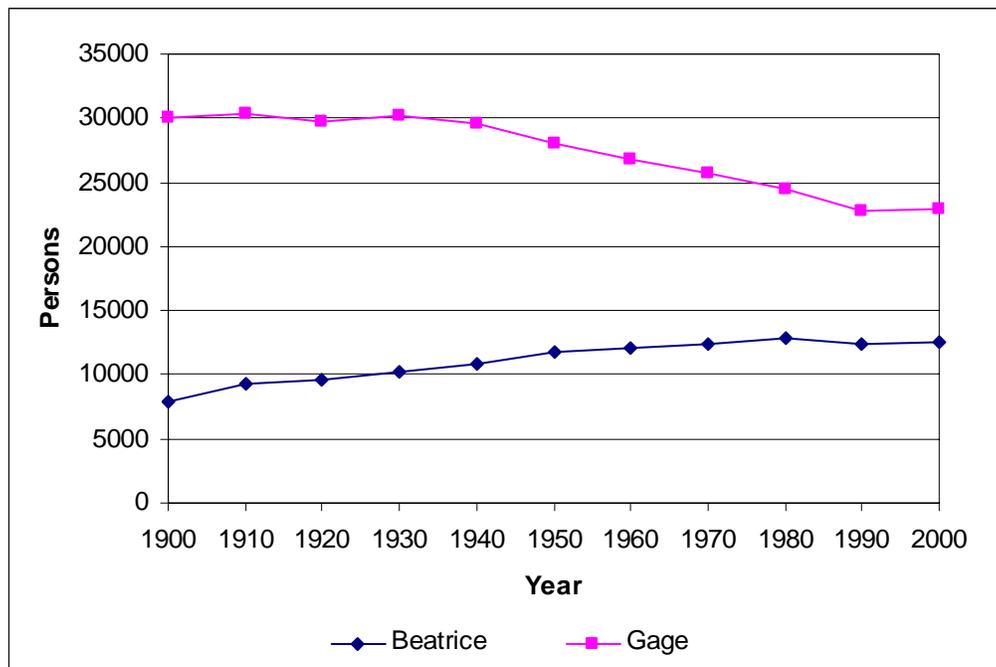


Figure 2. Population by Decade, 1900-2000

In Figure 3, a bar graph is shown displaying the percentage of the population in 1990 and 2000 divided among six age groups. The age groups are as follows: children (0-9 years old); teenagers (10-19); young adult (20-29); lower middle age (30-39); upper middle age (40-59); retirement (60-74); and elderly (75+). It can be seen that the young adult and lower middle age groups have decreased a little bit in this time span. This could be due to an out-migration of these people as they search for jobs elsewhere. Meanwhile there has been a significant increase of upper middle aged people. This increase could be explained by the in-migration of people

between the ages of 40 and 59. Some of the other changes can also be explained as people in lower age groups have shifted into older age brackets.

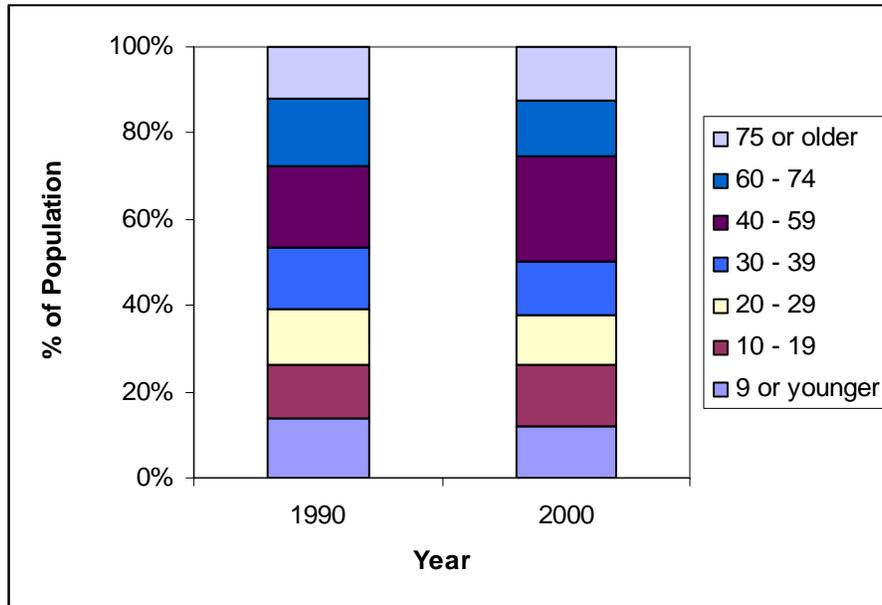


Figure 3. Percentage of Population by Age Groups

Developmental Patterns

A detailed inventory of the land use of Beatrice and thorough land use plan was completed with the *Comprehensive Development Plan for the City of Beatrice, Nebraska* in 2001. All of the information in this section is from that plan. A detailed filed survey was completed in 2000 to summarize the current land uses in Beatrice and its jurisdiction. The acreage and percentage breakdowns by general land use, as well as specific information on specific uses were determined. The results indicated that within the Beatrice corporate boundary, there are 4916 acres of land. Of this, 72%, or 3,533 acres are developed. The remaining 28%, or 1,383 acres, are either vacant or undeveloped. There are also 526 acres of land in the Extra-Territorial Jurisdiction.

In Table 1, a summary of the land use inventory shows the different land use types, their corresponding number of acres, and the percentage of the total City's land use between the years of 1966 and 2000. One trend that stands out is the increase in the amount of civic property since 1966. This has been caused by the inclusion of the airport, Hannibal Park and West Scott Street Ball fields within the city limits. The City has also acquired part of the floodplain, built the new Beatrice High School and Aquatic Park. The area in Beatrice devoted to parks and recreation has grown from 94 acres in 1996 to 224 in 2000.

| | Number of Acres | | | | % of Land Use | | | |
|------------------------|-----------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|
| | 1966 | 1976 | 1991 | 2000 | 1966 | 1976 | 1991 | 2000 |
| Residential | 825 | 1041 | 1201 | 1205 | 28% | 25% | 28% | 25% |
| Commercial | 66 | 185 | 189 | 181 | 2% | 4% | 4% | 4% |
| Industrial | 113 | 108 | 167 | 185 | 4% | 3% | 4% | 4% |
| Civic | 100 | 78 | 220 | 813 | 3% | 2% | 5% | 17% |
| Park/Recreation | 94 | 127 | 144 | 224 | 3% | 3% | 3% | 5% |
| Transportation | 846 | 1399 | 1285 | 925 | 29% | 34% | 30% | 19% |
| Vacant/Undeveloped | 872 | 1231 | 1043 | 1383 | 30% | 30% | 25% | 28% |
| <i>Total City Area</i> | <i>2916</i> | <i>4169</i> | <i>4249</i> | <i>4916</i> | <i>100%</i> | <i>100%</i> | <i>100%</i> | <i>100%</i> |

Table 1. Beatrice Land Use

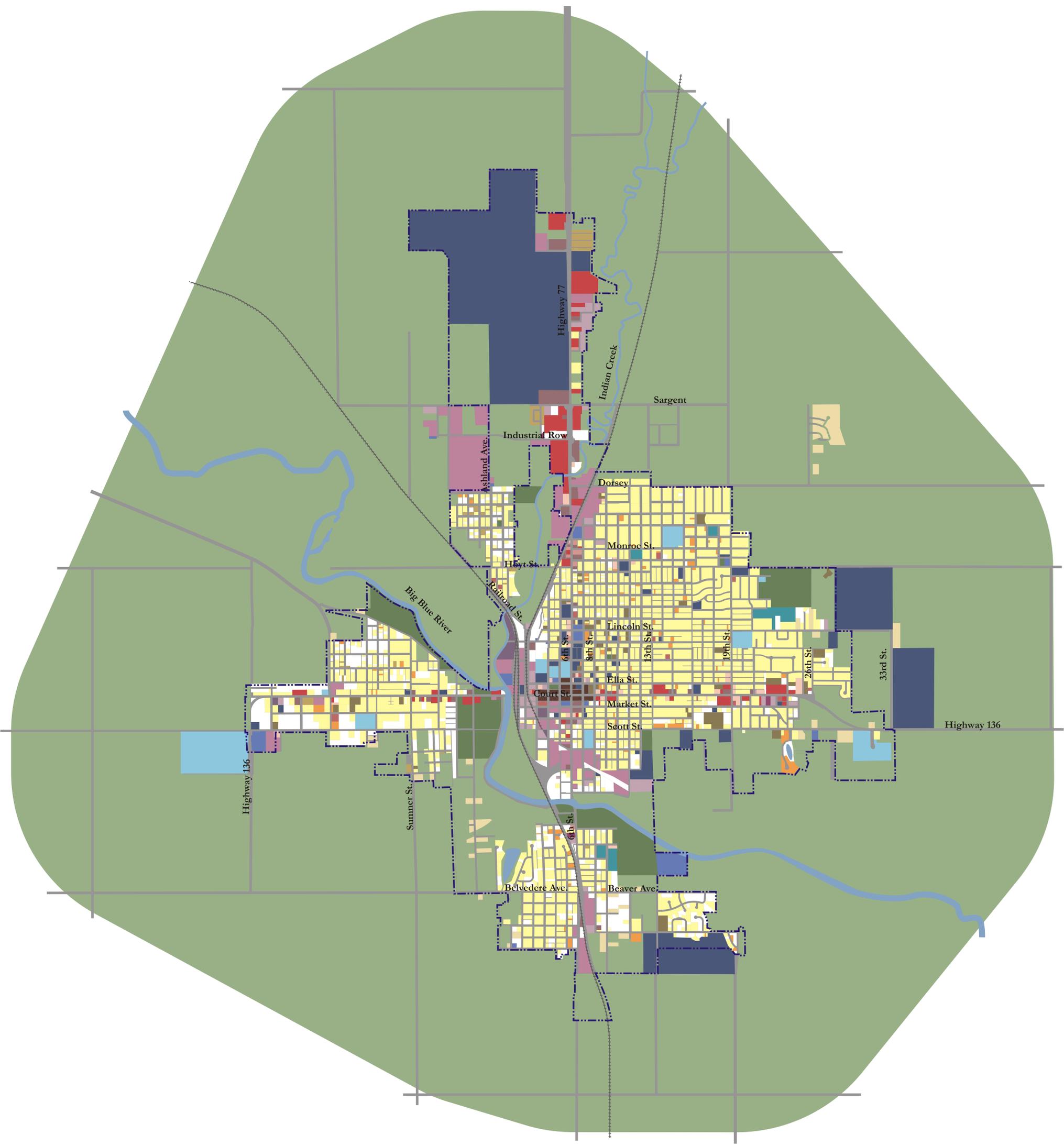
Source: Comprehensive Development Plan for the City of Beatrice

The *Comprehensive Development Plan* estimates based on modest in-migration, that Beatrice will need to build approximately 1,162 units or 58 units annually for the twenty year time period from the time of the plan in 2000 and 2020. This generates a hard demand need for 267 acres of additional residential development. To allow for residential conversion, the *Comprehensive Development Plan* recommends designating 535 acres of land. It also recommends that around 54 acres of land should be designated for future commercial development and 132 acres of industrial and business park land within and adjacent to the City be provided. This amounts to a total of 721 acres of land that should be designated for the twenty year period between 2000 and 2020. As of 2000, there were 1383 acres of vacant or undeveloped land that could be used for this. See Figure 4 for a map of the existing land use and Figure 5 for a map of the future land use designation on the following pages. These are taken from the Comprehensive Development Plan for the City of Beatrice.

 Existing Land Use
Beatrice, NE

0 1000 2000
 In Feet

-  Vacant
-  Agriculture / Open Space
-  Parks / Recreation
-  Rural Residential
-  Vacant Home
-  Single Family Residential
-  2-4 Plex Residential
-  Multi - Family Residential
-  Mobile Homes
-  Office / Financial
-  Service
-  Restaurant / Entertainment
-  Automotive
-  Retail
-  Downtown Mixed Use
-  Commercial Recreation
-  Educational - Schools
-  Public / Utility
-  Civic Uses
-  Warehouse
-  General Industrial
-  Salvage



0 1000 2000 4000

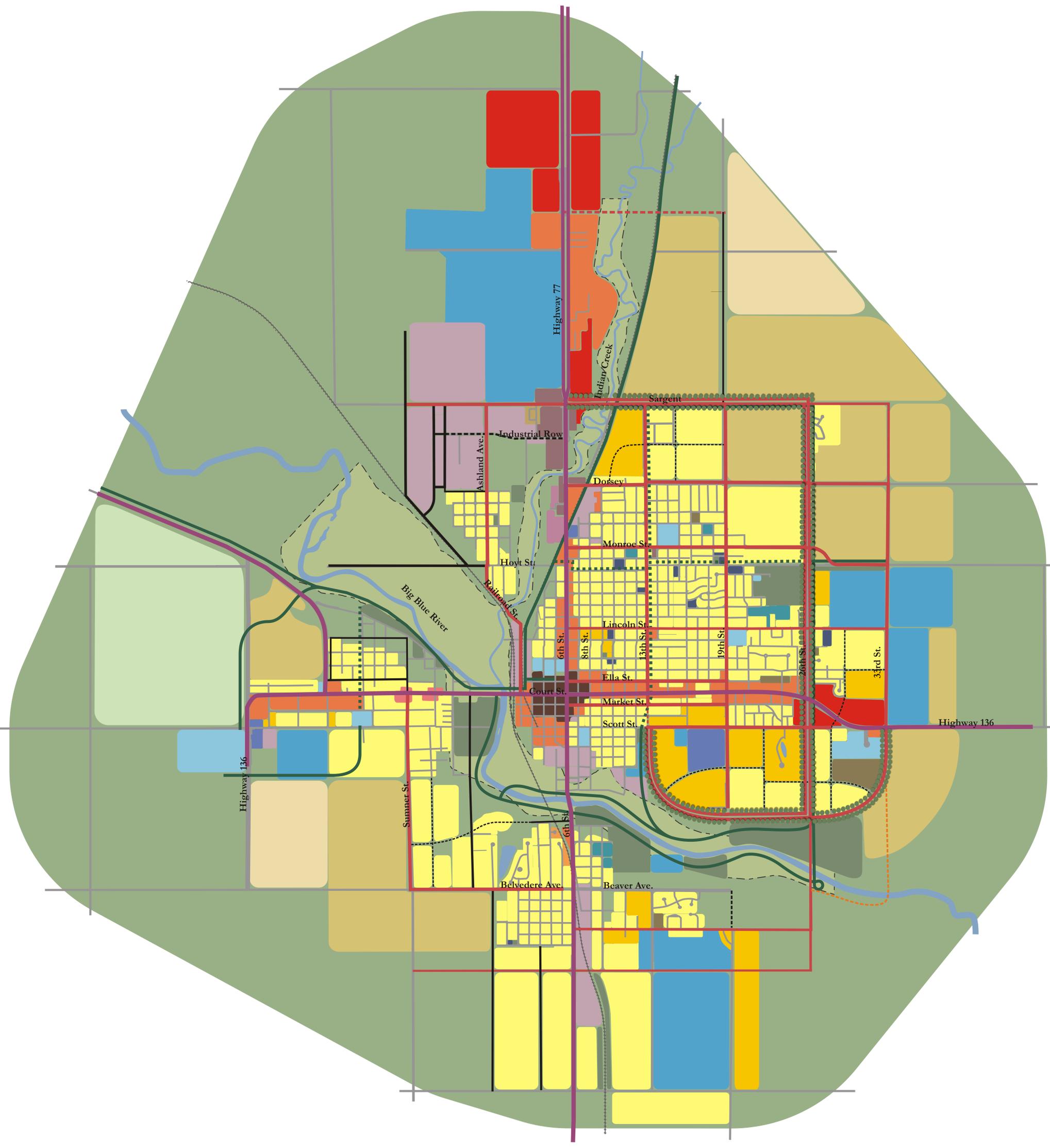
In Feet



Future Land Use Beatrice, Nebraska

RDG Crose Gardner Shukert
Omaha and Des Moines

- Single Family Residential
- Medium-Density Residential
- Urban Reserve
- Large Lot Residential
- Infill
- Conservation Reserve
- Mixed Use
- Commercial
- New Commercial
- Downtown
- Corridor Enhancement
- Neighborhood Center
- Historic District
- New Industrial
- Parks/Recreation
- Civic/Schools
- YMCA Expansion
- Arterials
- Proposed Arterials
- Highways
- Other Links
- Proposed Other Links
- Proposed Trails
- Corridor Enhancement



The *Comprehensive Development Plan* for Beatrice outlines desire for a unified City. It states:

The concept of a unified city requires a compact development pattern, rather than continued dispersion at the edges. Development will and should occur contiguous to new growth areas on the northeast, southeast, and southwest parts of the community. However, a significant amount of new growth should occur east of 19th Street and south of Scott Street to the Big Blue River. This area is already served by sewer and is close to vital community facilities and services, including the High School, Public Library and Aquatic Center. A second major growth area, in southwest Beatrice, can help to unify the southern and western parts of the City. Finally, north and northeast developments should utilize Hannibal Park, the U.P. Railroad trail and the Indian Creek corridor to create a compact urban area that provides convenient access to all parts of the City and can be served economically by utilities and public services.

Residential development in Beatrice can take many directions in the future. The plan recommends opening areas for new development that will result in a compact development pattern. Categories for development areas include currently platted subdivision, and areas likely to experience new development activity during the next twenty years.

Climate

The information below is taken from weather station 250620, at Beatrice. The data from this station is provided by the High Plains Regional Climate Center, and is from daily readings between June 1st, 1948 and October 31, 1984. For temperature and precipitation, multi-day accumulations are not considered either for records or averages.

In Figure 6, the daily temperature averages and the daily extremes are shown. Extreme Maximum is the maximum of all daily maximum temperatures recorded for the day of the year. Average Maximum is the average of all daily maximum temperatures recorded for the day of the year. Average Minimum is the average of all daily minimum temperatures recorded for the day of the year. Extreme Minimum is the minimum of all daily minimum temperatures recorded for the day of the year.

According to this data, the coldest recorded temperature in the City of Beatrice was -21 degrees Fahrenheit and occurred on December 22, 1983. The hottest recorded temperature in the City of Beatrice was 114 degrees Fahrenheit and occurred on July 14, 1954. Beatrice experiences a period of warming generally from February to July and a period of cooling from August to January. Average temperatures range from about 21 degrees Fahrenheit in January to about 80 Fahrenheit degrees in July.

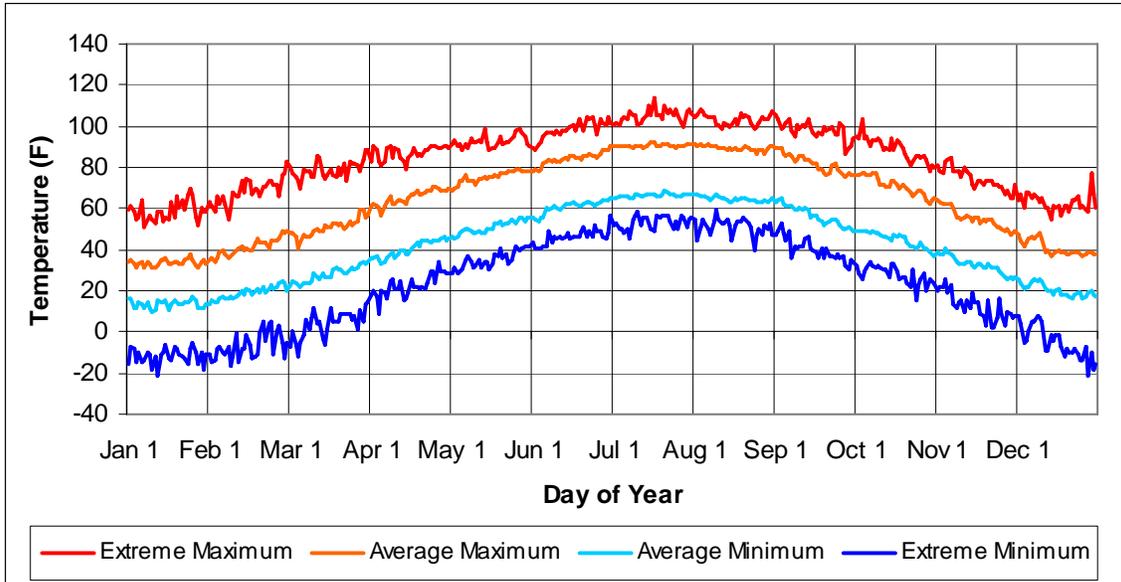


Figure 6. Daily Temperature Averages and Extremes

Figure 7 shows the average daily precipitation and the daily high precipitation. On average, Beatrice receives approximately 30.6 inches of rainfall annually. The most rainfall Beatrice has experienced in a day is 5.15 inches. This occurred on September 26th, 1973.

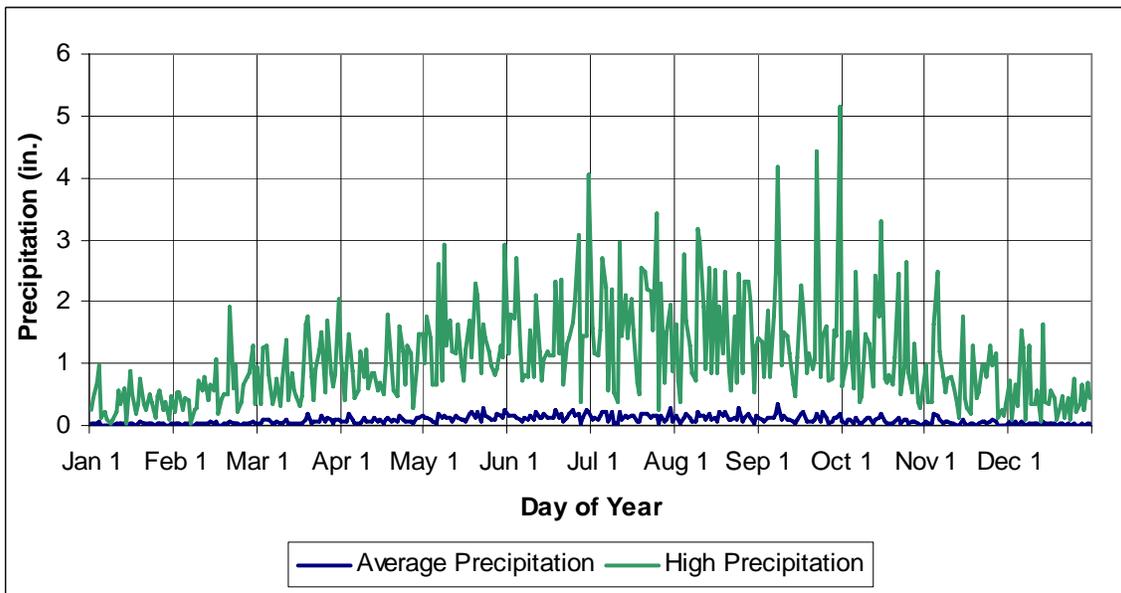


Figure 7. Daily Precipitation Average and High

In Figure 8, the daily snowfall averages and highs are shown. The High Snowfall is the greatest daily snowfall recorded for the day of the year. The Average Snowfall is the average of all daily snowfall recorded for the day of the year. The highest recorded daily snowfall in Beatrice was 13.0 inches and occurred on February 15th, 1969. Beatrice experiences snowfall generally from November until May.

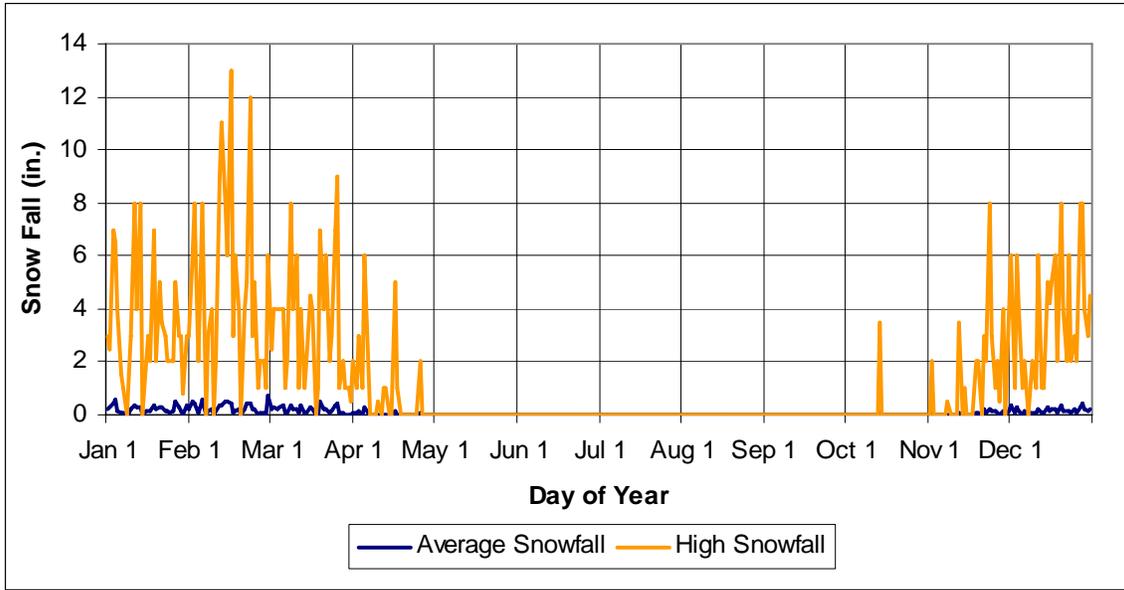


Figure 8. Daily Snowfall Average and High

In Figure 9, the daily snowdepth averages and highs are shown. The High Snowdepth is the greatest daily snowdepth recorded for the day of the year. The Average Snowdepth is the average of all daily snowdepth recorded for the day of the year. The highest recorded snowdepth in Beatrice was 28.0 inches and occurred on March 17th, 1960. The snowdepth and the snowfall generally coincide with each other.

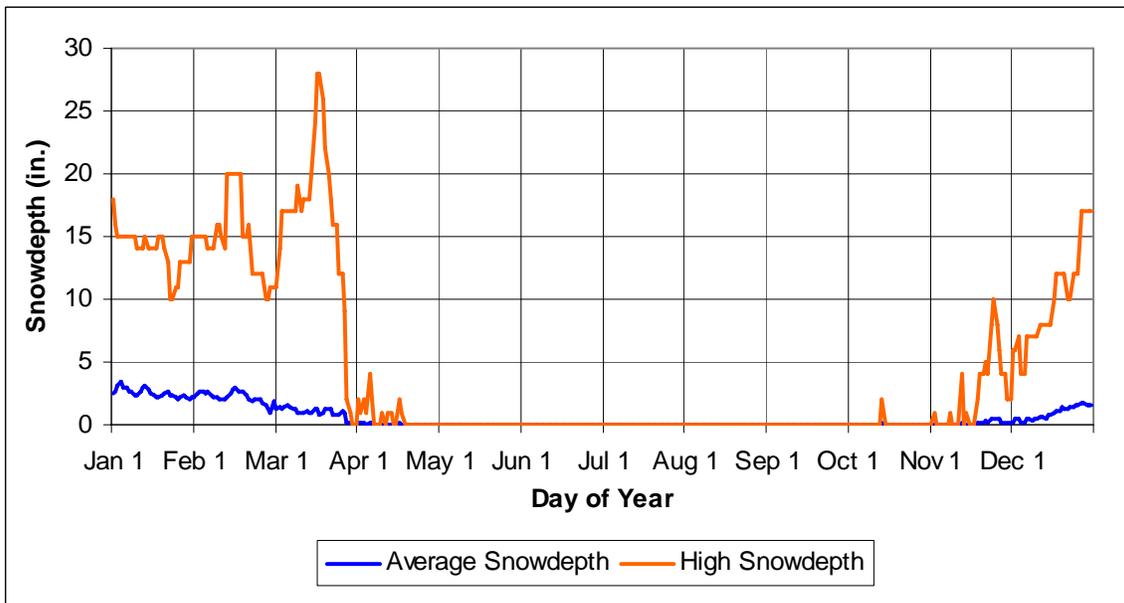


Figure 9. Daily Snowdepth Average and High

Section 4: Risk Assessment

In this section of the Beatrice Hazard Mitigation Plan, the risks posed to the City of Beatrice are identified and investigated. In the first portion of this section, *Hazard Identification*, the process and results of identifying the hazards in Beatrice are discussed. In the second portion of this section, *Structural Inventory and Critical Facilities*, the structural inventory is discussed. Then for each hazard that was identified, the profile and the historical event occurrences of that hazard are discussed. After this, the vulnerability of Beatrice toward each hazard is assessed, including the vulnerable structures and the potential losses that could occur in the event of the hazard occurring.

Hazard Identification

The Key Personnel for the City of Beatrice Hazard Mitigation Plan was assembled with the public to provide input and support for the Hazard Mitigation Plan on October 2nd, 2006. After the group was assembled, the purpose, general purpose of the mitigation plan were communicated and established. JEO, along with the City reviewed specific hazards identified by the State Hazard Mitigation Officer and conducted research to identify those that pose a threat to Beatrice. Furthermore, attendants at the public meeting, including City officials were also able to identify specific hazards that pose a threat to the City of Beatrice. (Documents of the public meeting are shown in Appendix B.) A worksheet was provided to each person to gather information on each hazard and to prioritize the different hazards identified. They completed their worksheets based on land use regulations, the Comprehensive Development Plan for The City of Beatrice, flood ordinances, along with other information from federal agencies, state agencies, local agencies and long-time residents of Beatrice. The completed Hazard Identification Worksheets identified and listed the following information:

- Hazard type and ranking (both natural and human-made disasters)
- Is the hazard present?
- What is the severity of the risk (high, moderate or low)
- Are there previous occurrences?
- Additional information of previous occurrences such as date, location, description and damages.

After the Hazard Identification Worksheets were completed by members at the meeting, the Composite Hazard Identification Table was compiled. In this composite table, hazards were ranked based on the cumulative input from the first public meeting and research conducted by JEO of hazard data and risk information acquired from U.S. Geologic Survey (USGS). The prevalence and risk of identified hazards was acquired by various sources including FEMA, USGS, and NOAA, and is discussed further in more detail later. Along with the ranking are the Likelihood of a hazard occurring; the Hazard Risk; and the Vulnerability. Information on previous occurrences was also documented. Table 2 shows the Composite Hazard Identification Table that was developed from the cumulative input from the meeting and research.

| Hazard Type | | Likely to Experience? | Hazard Risk | Vulnerability |
|-------------|---------------------|-----------------------|---------------------|--------------------------------------|
| Rank | | Yes / No | High / Medium / Low | Full, Severe, Limited, None, Unknown |
| 1 | Severe Thunderstorm | Yes | High | Severe |
| 2 | Tornado/High Winds | Yes | High | Severe |
| 3 | Severe Winter Storm | Yes | Medium | Severe |
| 4 | Flooding | Yes | Medium | Limited |
| 5 | Drought | Yes | High | Severe |
| 6 | Extreme Heat | Yes | High | Limited |
| --- | Dam Failure | No | Low | Limited |
| --- | Earthquake | No | Low | Limited |
| --- | Wildfire | No | Low | None |
| --- | Landslide | No | Low | None |
| --- | Levee Failure | No | Low | None |

Table 2. Composite Hazards Identification Table from Cumulative Effort

Some of these hazards identified often occur together. Tornadoes, flooding, and wildfire from lightning can be a direct result of severe thunderstorms. Also, extreme heat and wildfires often accompany a drought. However, for the purpose of this plan, tornados, wildfires and flooding were identified as a separate hazard event as they can occur separately and often pose different types of threats. Similarly, extreme heat, wildfires and drought were identified as separate hazards as they can also occur independently of one another and can cause different results.

In the initial public meeting for the development of this hazard mitigation plan, Beatrice residents ranked their community most vulnerable to the hazard types in this order: severe thunderstorm, tornado/high wind, severe winter storm, flooding, drought, extreme heat, dam failure, earthquake, wildfire, landslide and levee failure. Due to the geographical proximity, the following hazard types were not considered due to there being no likelihood or occurring in Nebraska: volcanic eruptions, avalanches, hurricanes, tidal surges, and tsunamis.

In the following sections, the hazard types which have a significant likelihood of occurring or have a reason to potentially occur are listed. These types are: severe thunderstorm, tornado/high wind, severe winter storm, flooding, drought, extreme heat, dam failure, and earthquake. Although there is a small risk for wildfires, and landslides, research concluded that the risk is not high enough to warrant detailed discussion in this plan. Furthermore, Beatrice citizens and community officials also did not feel wildfires or landslides pose a threat to Beatrice. Additionally, it was discovered that Levee Failure is not a present hazard in Beatrice. This may change in future updates.

Below lists the reasons why wildfire, landslides and levee failure were eliminated from detailed discussion in this plan:

Wildfires

The U.S. Geological Survey (USGS), in the Fact Sheet 2006-3015 “*Wildfire Hazards-A National Threat*,” identify locations that experience wildfire greater than 250 acres from 1980 to 2003. (See Figure 10 below.) This information comes from sources of the Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service and the USGS National Atlas. From this data, and the fact that no area in, or around, Beatrice has experienced wildfire, it was determined there is not a significant enough threat to warrant detailed discussion in this plan.



Figure 10. Wildfires in the United States and Puerto Rico
Source: USGS Fact Sheet 2006-3015, *Wildfire Hazards – A National Threat*

Landslides

The USGS, in Fact Sheet 2005-3156 “*Landslide Hazards-A National Threat*,” publishes a map of landslide potential of the conterminous United States. (See Figure 11 below.) Red is very high potential, yellow is high potential, green is moderate, and the risk is low in the unmarked areas. The source of this data comes from the National Atlas and USGS. Furthermore the University Of Nebraska School of Natural Resources maintains a database of Landslides in Nebraska. From these two data sources, there has not been a landslide in or around Beatrice and it was determined that landslides do not pose a significant enough threat to warrant detailed discussion in this plan.

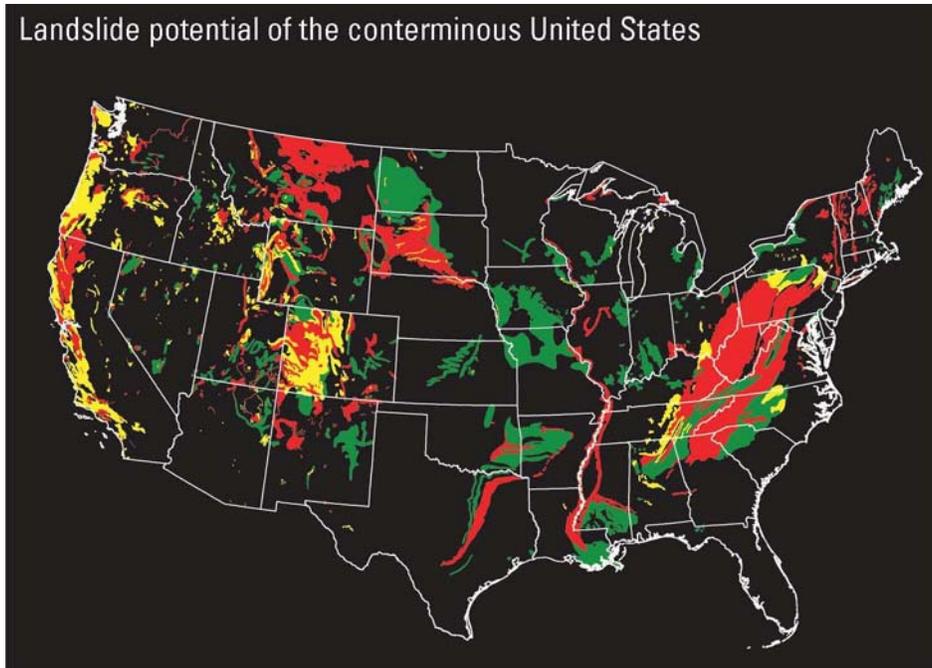


Figure 11. Landslide Potential of the Conterminous United States
Source: USGS Fact Sheet 2005-3156, Landslide Hazards – A National Threat

Levee Failure

The USGS 7.5 Minute Topographic maps of 'Beatrice West, NE' as well as the FEMA FIRM map (see Appendix C) indicate that there is a Levee on the North side of the confluence of Indian Creek and Big Blue River as well as on the East side of Indian Creek. The U.S. Army Corp of Engineers was contacted about these 'levees'. They maintain there are no levees in Gage County, which includes Beatrice. Furthermore, the City maintains these are not functional levees, but merely 'high spots' along the banks. A closer look at the FEMA FIRM map shows that the Base Flood Elevation (BFE) Lines go right through the 'levees', thus indicating that the 'levees' do not provide any protection from a flooding event. Although these "high spots" or berms possibly provide some protection from a flooding event, the failure of them does not pose a significant enough threat to warrant detailed discussion in this plan. Additionally, there are no structures protected by these berms.

A few man-made hazards were discussed at the meetings such as economic disasters, communication failure, and terrorism. However it was the City's decision to remove these non-natural hazards from consideration as they want this plan to only address natural hazards. Also, these man-made hazards and their effects are covered under Local Emergency Operations Plan (LEOP). This may change in future updates.

Structural Inventory and Critical Facilities

In order to get a more accurate view of the structures in Beatrice, a structural inventory was completed for the City of Beatrice. This inventory was done as a first step toward understanding the potential losses in the City. The buildings types were determined from a combination of looking at recent aerial photographs, the Beatrice Land Use map, plat maps, and from physically visiting locations. In the future, this inventory could be expanded upon with such things as addresses, contents value, replacement value, occupancy, and elevation. The structural inventory identified 5742 structures. Ten Warning Sirens were also located. The structures were broken into several different classifications. These classifications are as follows:

- Churches
- Commercial Structures –Buildings that businesses are run from or use
- Out Structures – Buildings which are non-occupied garages or sheds
- Public Structures – Buildings such as Hospitals, Fire Departments, Police Departments, Utility Services, libraries, and other government buildings. These Structures are considered Critical Facilities due to their operative and historical importance.
- Residential Structures – Buildings occupied by persons
- Public Schools

Critical facilities were identified by the City as those structures that have historical significance or are essential for returning the City’s functions to normal during and after a disaster. Critical facilities are also those which are vital for the disaster response and providing for the public such as with sheltering. For this reason, all of the Public Structures, Churches and Public Schools are deemed critical facilities. The structural inventory identified a total of 92 critical facilities in the City. The critical facilities identified are:

- Churches
 - All denominations
- Public Structures
 - Hospital
 - Post Office
 - Board of Public Works Buildings and Offices
 - Public Golf and Park Facilities
 - Courthouse
 - Library
 - Chamber of Commerce
 - Train Station & Museum
 - Water Treatment Facility
 - Police Department
 - Fire and Rescue Buildings
 - Assisted Living Facilities
- Public Schools
 - Stoddard Elementary School
 - Cedar Elementary School
 - Beatrice Middle School
 - Paddock Lane Elementary School
 - Lincoln Elementary School
 - Beatrice High School

For the number of structures in each classification and the results of the Structural Inventory, see Table 3.

| Type | Number of Structures |
|------------------------|----------------------|
| Churches | 27 |
| Commercial Structures | 480 |
| Out Structures | 126 |
| Public Structures | 59 |
| Residential Structures | 5044 |
| Public Schools | 6 |
| Total | 5742 |

Table 3. Structures Identified in Beatrice Structural Inventory

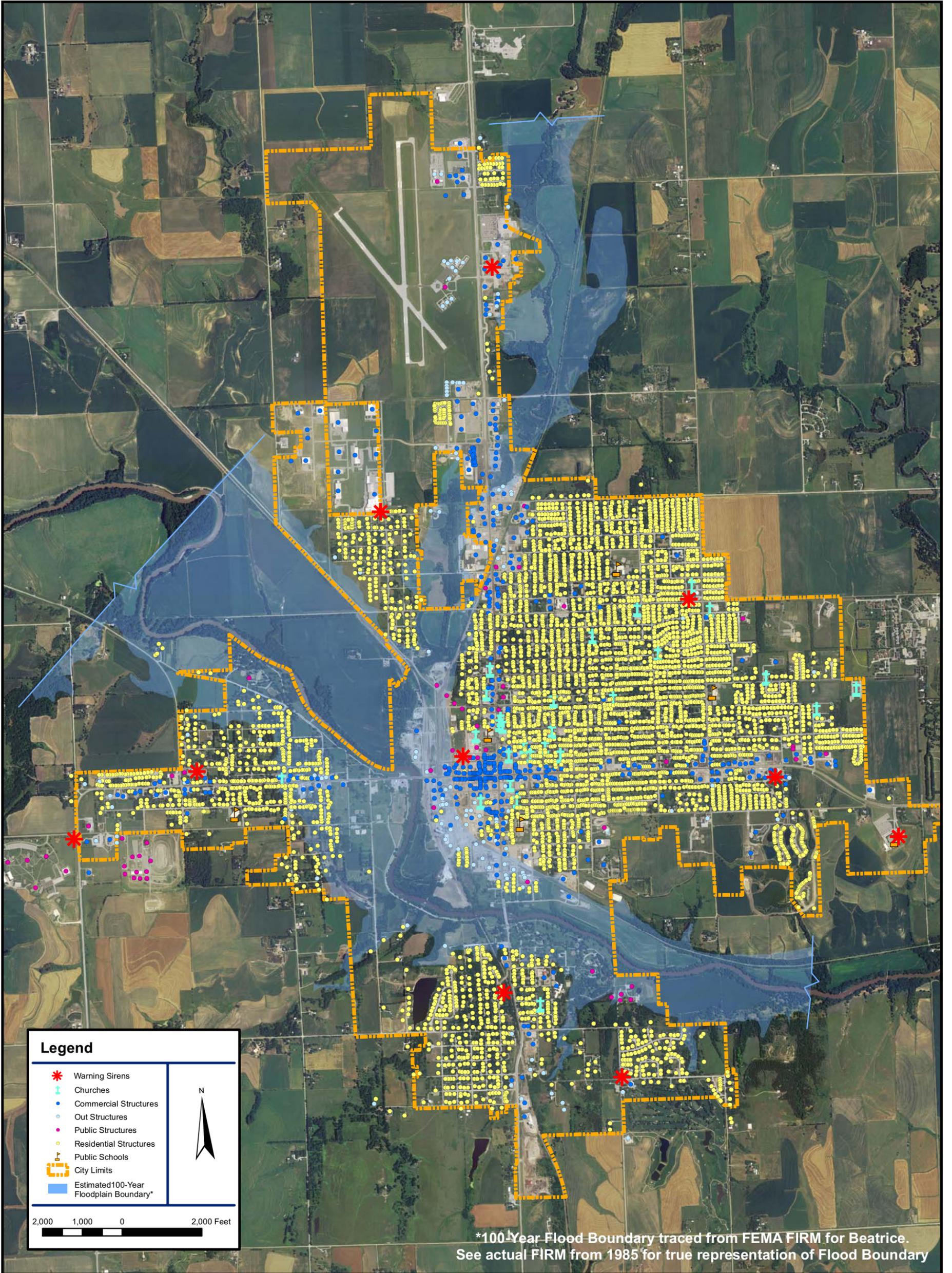


Figure 12

City of Beatrice, NE
- Beatrice Hazard Mitigation Plan -
Figure 12: Structural Inventory with Estimated 100-Year Flood Boundary



A map showing the location of the structures in each classification is shown in Figure 12. In this map of Beatrice, each classification is shown with different symbols along with the Warning Siren locations and an estimated 100-Year Flood Boundary. This Flood Boundary should be used as an estimate only as it is not FEMA's actual Flood Insurance Rate Map for Beatrice. For true 100-Year Flood Boundaries see the actual FIRM map, revised in January 3rd, 1985, in Appendix C. For discussion of this floodplain and the results of the flood vulnerability assessment, see the *Flooding* portion of this section.

According to the Nebraska Department of Property Assessment and Taxation, the total assessed taxable value for Beatrice in 2007 was \$506,181,145. Detailed breakdowns of this data by significant property type are as follows:

Residential Real Property: \$367,455,210
Commercial / Industrial Real Property: \$114,570,625
Commercial / Industrial Personal Property: \$19,418,450
Railroad and Personal Property: \$615,177
Public Service Corp. Real and Personal Property: \$4,040,804
Agricultural Land and Equipment Personal Property: \$80,879

The entire structure stock is vulnerable to Severe Thunderstorm, Tornados, Severe Winter Storms, Drought, Extreme Heat and Earthquake. The total assets of the community of \$506,181,145 are at-risk for these hazard types.

NFIP Repetitive Loss Structures

Nebraska Department of Natural Resources (DNR) was contacted to see if there were any existing buildings, infrastructure, and/or critical facilities that are classified as NFIP Repetitive Loss Structures. A list was provided by the DNR of Repetitive Loss Structures. According to the DNR, the list was last updated in 2005. The City of Beatrice reviewed their records and concluded that all NFIP Repetitive Loss Structures as of February 2008 have been acquired and demolished. Below is a list of structures that have been acquired and demolished and the date they were demolished. Figure 13 shows the locations of where these structures once stood in the floodplain. It should be noted that FEMA's database of Repetitive Loss Structures may not be up to date if form AW-501 "NFIP Repetitive Loss Worksheet" has not been submitted to FEMA by the State.

| | <u>Address</u> | <u>Date Demolished</u> |
|-----|-----------------------------|------------------------|
| 1. | 103 W. Court | 2/20/2008 |
| 2. | 408 W. Court | 12/27/1995 |
| 3. | 124 N. Bluff | 4/8/1993 |
| 4. | 119 S. Center | 2/15/1994 |
| 5. | 121 W. Court | 2/23/2004 |
| 6. | 401 N. Lasalle | 10/5/1995 |
| 7. | 425 N. 2 nd St. | 1/12/1995 |
| 8. | 907 S. 6 th St. | 4/8/1996 |
| 9. | 322 W. Court | 10/4/1995 |
| 10. | 326 W. Court | 10/4/1995 |
| 11. | 505 Cole | 6/26/1996 |
| 12. | 709 Grable St. | 3/15/1996 |
| 13. | 823 Grable St. | 10/15/1995 |
| 14. | 801 S. 5 th St. | 10/6/1995 |
| 15. | 917 S. 7 th St. | 10/4/1995 |
| 16. | 1109 S. 9 th St. | 10/5/1995 |



Figure 13. Locations of Mitigated NFIP Repetitive Loss Structures

Community Rating System (CRS)

It was found that Beatrice is not a CRS community as defined by FEMA.

Severe Thunderstorm

Hazard Profile

As with most hazards that occur, a thunderstorm is a highly unpredictable event. However, thunderstorms differ from many other hazards in that they are generally large in magnitude, long in duration, and traverse communities so they end up covering large areas of land. Severe thunderstorms usually occur in the evening during the spring and summer months. These often massive storms can include heavy rain, hail, lightning, high wind and sometimes tornados. Furthermore, heavy rains can cause flooding; lightning can cause wildfires; and high winds can down trees that can cause power outages if they fall on power lines. The general definition of a severe thunderstorm is a thunderstorm that contains: winds 90 km/h or greater, 2 cm or larger hail, or tornados. For the purpose of this Hazard Mitigation Plan, tornados, wildfires and flooding were identified as a separate hazard event as they sometimes occur separately, often pose different types of threats, and the losses associated with each can vary greatly.



Figure 14. Example of a Thunderstorm Cloud
Source: Kenn Kiser

Thunderstorms are generally beneficial in that they provide rain for crops and plants. The majority of thunderstorms do not cause any damage, but when they become severe, the damages can include: damaged crops from wind and hail; damaged buildings and automobiles from hail; flash flooding; and death or injury from lightning. Thunderstorms can develop in less than 30 minutes and can grow up to 8 miles into the atmosphere. Approximately 100,000 thunderstorms occur in the United States every year. Lightning, by definition, is present in all thunderstorms and is caused when there is a buildup of charged ions in the upper part of the thunderstorm cloud, known as the Anvil. When the energy is released, lightning connects to the ground, releasing large amounts of electricity that can be harmful to humans and can short out the electrical systems in communities. Lightning can strike up to 10 miles from the rain portion of the storm. Hailstones are ice formations that fall with rain that are greater than 0.75 inches. They

can fall at speeds up to 100 mph. The largest hailstone ever recorded in the United States was found on June 22, 2003 in Aurora, NE and measured about 7 inches in diameter. Hail causes nearly one billion dollars (U.S.) in damage to property and crops annually.

The National Weather Service does not issue warnings for lightning or for ordinary thunderstorms, but they do highlight the probability of them in daily forecasts. Some indications of a forming thunderstorm include:

- Dark skies
- Sudden wind change
- Drop in temperature

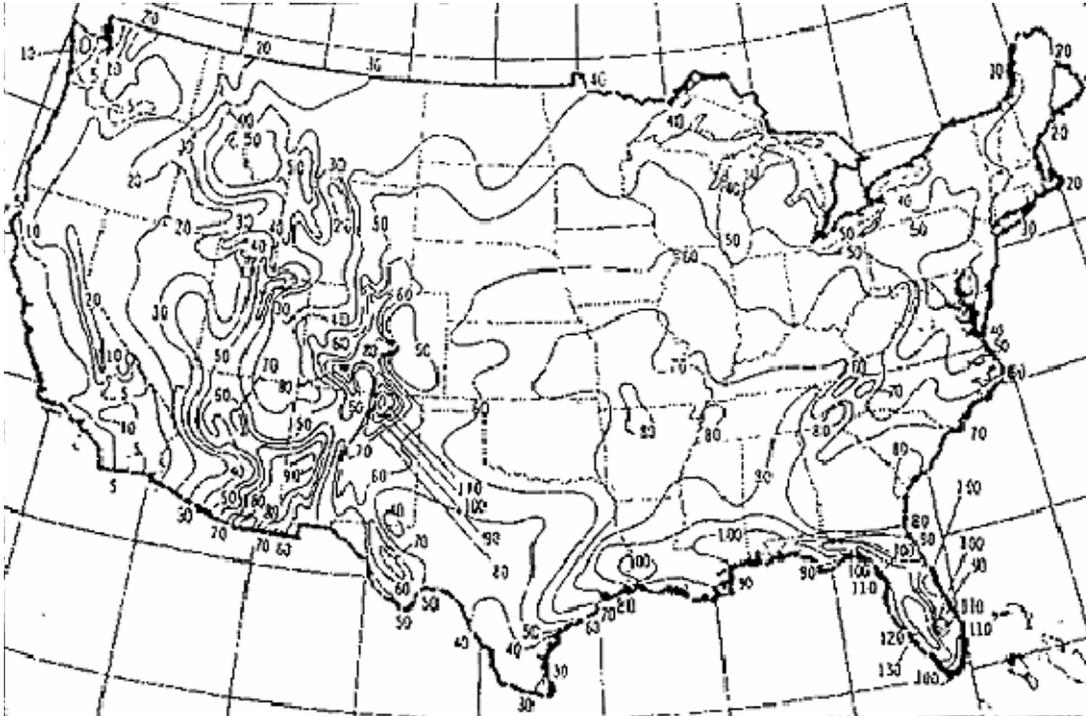


Figure 15. Average U.S. Thunderstorm Days/Year
Source: National Lightning Safety Institute

According to Figure 15 from the National Lightning Safety Institute, Western Nebraska has about 60 thunderstorm days per year.

Historical Occurrence

The key officials and member of the community in Beatrice recorded that there have been previous occurrences of severe thunderstorms in or around Beatrice. One specific occurrence that was mentioned was a severe thunderstorm that occurred in July of 2001. Severe thunderstorms were noted by the community as being periodic.

Historical accounts of severe thunderstorm events from the National Climatic Data Center (NCDC) are shown below. The NCDC has the world's largest active archive of weather data. The Storms Events Database currently contains thunderstorm weather events from 1953 to 2006, although the damages accrued from such events are only recorded for the last 30 years. The list includes events that are directly caused by severe thunderstorms such as hail, high wind, heavy rain, and lightning. Tornadoes also accompany thunderstorms but are discussed separately later

in this report; flooding from heavy rain is also discussed separately, later in this report. Only the noteworthy events that occurred exclusively in Beatrice are listed.

- **July 6, 1994:** *Property Damage: \$500,000.* Lightning started a fire which destroyed much of the Beatrice Greenhouse. Lightning also struck a home, which started a fire that caused severe damage to the structure.
- **July 23, 1995:** *Property Damage: \$10,000. Crop Damage: \$3,000.* Heavy rain caused \$3,000 in damages and lightning caused \$10,000 in damages. No further information was available.
- **May 16, 1995:** *Damages: No information available on damage cost.* Two inches of heavy rain fell in 15 minutes. Hail size reported: 1.75 inches.
- **May 7, 1996:** *Property Damage: \$1,000.* Lightning strikes northwest of Beatrice caused the City's water wells to shut down and took out power. Lightning also struck a home in Beatrice doing damage to the house.
- **April 6, 1998:** *Property Damage: \$4,000.* Lightning struck the chimney of a home causing damage.
- **April 8, 2001:** *Property Damage: \$20,000.* Hail up to 1 inch in diameter damaged some windows in Beatrice including the marquee at the Cinema Centre on Court St. in Beatrice.
- **April 11, 2001:** *Damages: No information available on damage cost.* Thunderstorm wind gusts estimated at over 60 mph caused extensive tree damage near Beatrice. The wind damage was with the same thunderstorm complex that caused the wind damage near Endicott and the tornadoes in Wymore and Virginia.
- **September 12, 2001:** *Damages: No information available on damage cost.* A downburst with winds estimated at over 70 mph downed trees, twisted street signs and flattened and stripped crops north of Beatrice.
- **July 13, 2006:** *Damages: No information available on damage cost.* Hail that eventually reached tennis ball size fell for a little over 10 minutes in Beatrice. The largest stones in town were fairly isolated; apparently most of the larger stones that caused the most damage fell southeast of town in the Holmesville area. Hail size: 2.5 inches.

Vulnerability Assessment

Severe thunderstorms were determined by Key Personnel and public to be a "High" hazard risk and the City of Beatrice was determined to be "Severely" vulnerable to their effects. The City of Beatrice and its farming community is very vulnerable to a severe thunderstorm event. The storms generally move in from the west. Farmers outside the city limits could have their crops damaged by hail and wind. Wind could be potentially damaging to the many mobile home parks in the City that are susceptible to high winds. The rain could cause loss of topsoil. The city-dwellers could have their roofs and windows damaged by hail, along with their cars. Trees could be destroyed and tree limbs could be broken off from wind, causing power outages, damages to vehicles and structures, and possibly injure people. Power is supplied to rural areas by Beatrice, and not only could the City of Beatrice be affected, but also people in rural areas surrounding Beatrice. Lightning could potentially knock out electricity in the City of Beatrice, start fires, and could potentially cause loss of life of persons.

Due to the nature of severe thunderstorms, the whole city is within the hazard area boundaries, and the entire infrastructure including critical facilities and proposed structures can be damaged from a severe thunderstorm. Although the damage could include roofs, windows, and vehicles, there is little threat that any critical facilities would be made wholly inoperative.

Potential Losses

Due to the irregularity of thunderstorms and their varying degree of size and magnitude, it is not feasible to estimate the potential losses of a severe thunderstorm event. For the City of Beatrice, the worse event ever recorded occurred in 1994 and caused property damages of \$500,000. Other thunderstorm events recorded reported property damages. Given this information, the potential loss for the City of Beatrice in the event of a severe thunderstorm could range from \$1000 to \$500,000. A severe thunderstorm could affect the entire community as they generally traverse communities. It is difficult to estimate any localized damages from a severe thunderstorm, the storm could affect only portions of the community, or could affect the entire community. A major event with losses summing to one-half of a million dollars has the potential of causing loss of cars, roofs, power lines, trees and tree limbs, and most importantly the loss of life. Furthermore, power outages could cause economic loss to businesses. The losses associated with tornados and flooding as a result of heavy rains are addressed later in this report. It should be noted that there could be loss from displacement, but there was not enough information to investigate this. This could be updated in future updates of the plan.

Tornado / High Winds

Hazard Profile

A tornado is typically associated with a severe thunderstorm and more specifically a supercell thunderstorm. Exactly how a tornado forms is a complex process and is not fully understood by scientists. They are believed to be formed when cold air overrides a layer of warm air. This forces the warm air to rise quickly. As a thunderstorm develops, a large change in direction with height (or "wind shear") or an increase in wind speed produces a horizontal spinning area of air. The updrafts of warm air cause the rotation to move from horizontal to vertical. Then, as the rotation increases, a funnel is produced and the water vapor in this funnel cloud is drawn towards the ground. This is commonly referred to as "touching down." In order for rotations to be classified as tornados, three characteristics must be met:

1. It must be a microscale rotating area of wind, ranging from a few feet to a few miles wide.
2. The rotating wind, or vortex, must be attached to a convective cloud base and must be in contact with the ground.
3. The spinning vortex of air must have caused enough damage to be classified by the Fujita Scale as a tornado.

Once tornados are formed, they can be extremely violent and destructive. They have been recorded all over the world, but are most prevalent in the American Midwest and South, in the area known as Tornado Alley. About 1,000 tornados are reported every year in the contiguous United States. Figure 16 shows the tornado activity in the United States as recorded by the National Oceanic and Atmospheric Administration (NOAA). Tornados can travel as distance over 100 miles, can reach 60,000 ft above ground and usually stay on the ground no more than 20 minutes. Their season is typically in March and April, where 80% of them occur between noon and midnight.

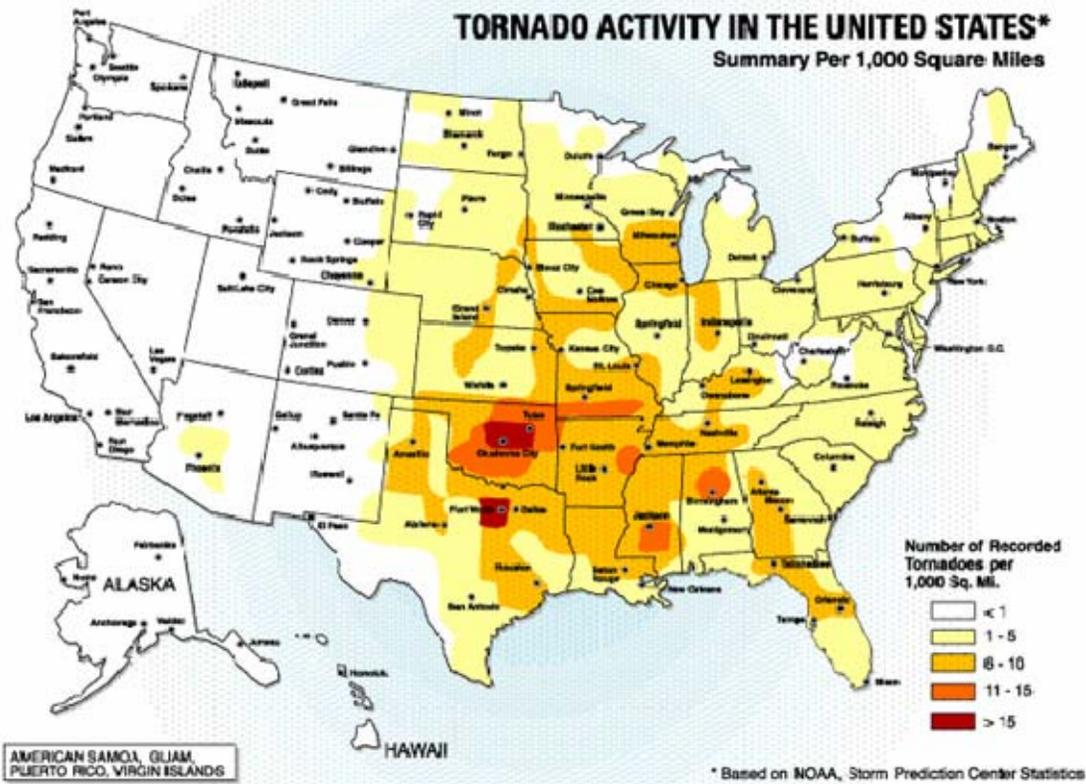


Figure 1.1 The number of tornadoes recorded per 1,000 square miles

Figure 16. Tornado Activity in the United States
Source: National Oceanic and Atmospheric Administration (NOAA)

The magnitude of tornadoes is measured by intensity on the Fujita-Pearson Tornado Scale, or simply the Fujita Scale. The Fujita Scale does not measure tornadoes by their size or width, but rather the amount of damage it causes on human-built structures and trees. The scale ranges from F0 for the weakest, to F6 for the most powerful, although no F6 has ever been recorded. Table 4 shows the Fujita Scale corresponding to the amount of damage done and the wind speed.

| F-Scale Number | Intensity Phrase | Wind Speed | Type of Damage Done |
|----------------|-----------------------|-------------|---|
| F0 | Gale tornado | 40-72 mph | Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged. |
| F1 | Moderate tornado | 73-112 mph | The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed. |
| F2 | Significant tornado | 113-157 mph | Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated. |
| F3 | Severe tornado | 158-206 mph | Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown. |
| F4 | Devastating tornado | 207-260 mph | Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated. |
| F5 | Incredible tornado | 261-318 mph | Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters (100 yd); trees debarked; steel re-enforced concrete structures badly damaged; incredible phenomena will occur. |
| F6 | Inconceivable tornado | 319-379 mph | These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies. |

Table 4. Fujita Scale for Measuring the Intensity of Tornadoes

After a tornado has passed through an area an official Fujita Scale category is determined. Engineers and meteorologists examine the damage, look at the ground-swirl patterns, look at damage imagery, media reports, and sometimes photogrammetry and videogrammetry. Based on the most severe damage to any well-built frame house, or comparable damage as determined by engineer, an F-Scale number is assigned to the tornado. The Fujita Scale is currently in the process of being updated with the Enhanced F Scale beginning in 2007 and will replace the Fujita Scale. The enhanced scale classifies F0-F5 damage as determined by engineers and meteorologists across 28 different types of damage indicators including different types of buildings and trees. More information on the new scale can be found through the NOAA.

Historical Occurrence

According to the National Weather Service, tornadoes kill about 42 people every year in the United States. In the past, before forecasting and awareness programs were implemented, many deaths occurred from tornadoes. One of the worst events in U.S. history occurred on March 18th, 1925 where 695 people died in a large tornadic event spanning Missouri, Illinois and Indiana. Since 1971, no more than 50 people have died from any single tornado. A more recent tragic tornado occurred in Hallam, NE on May 22nd, 2004. This tornado had an F-Scale rating of F4 and it completely destroyed the town of Hallam. The tornado even derailed and destroyed hopper cars from a railroad track that runs by Hallam. It also made its way into Gage County and is currently is the world's widest known tornado at 2.5 miles in diameter.

Key officials and member of the community in Beatrice recorded that there have been previous occurrences of tornados in or around Beatrice. The key officials and members of the community did not collect any data on specific events, but the Beatrice Historian noted:

In 1996 a tornado moved through Beatrice from the northwest. This was the first tornado actually recorded in the historic Beatrice where it touched down at 13th Street, the original edge of the town's original plat. This was noted by people who had felt safe from the time of the Indian legend of protection due to Beatrice's location on the bend of the river. In the 1890s a tornado had touched down for 10 seconds in the Glenover area, (northwest Beatrice, a "suburban area" in the 19th century.) The usual tornado path is from the southwest. In the past these have missed all but the Country Club area.

The NCDC has record of funnel clouds and tornadic events. From its database, the F2 tornado that occurred on May 8th, 1996 produced 15 injuries and \$12 million in damages. It says the following about the event:

The beginning of the tornado started 4 1/2 miles west northwest of downtown Beatrice, just north of the Homestead National Monument. The storm damaged trees just north of state highway 4 when it struck several homes, primarily lifting the roofs off of them. The tornado was rated F1 at that point. Around 1/2 mile to the east, the tornado struck a subdivision. The damage was more severe, with collapsed outer walls and roofs off homes. The tornado damage was rated as a strong F2 in this area. The tornado, continuing to move in an east southeast direction, nearly paralleling highway 4, struck a church. Part of the roof was lost off the church. After striking the church, the tornado hit several more homes and barns before entering the heart of the city. The damage path width of the tornado was 1/4 to 1/2 mile wide, with damaging thunderstorms winds out to 1 1/2 mile. The main tornado path remained 1/4 to 1/2 mile wide north of U.S. highway 136, with much of the damage south of highway 136 due to thunderstorm downburst winds. The tornado strength weakened when entering the city, with an F-scale strength between F0-F1. Although much of the damage in the central city area was due to falling trees and large tree limbs, other damage noted was roofing torn off of several buildings and a collapsed 200 foot communication tower. After the storm exited the city, it regained strength. The tornado also began curving to the northeast. The storm maintained about F1 strength from about 1 mile east of downtown Beatrice to the storm's dissipation, approximately 3 miles northeast of the city. The strong F2 tornado's path was 9.5 miles long.

The NCDC database also lists three funnel cloud reports in their database for Beatrice. These occurred on May 14, 1993, June 20, 1998, and March 30, 2006. Furthermore, just outside of Beatrice, an off duty police officer had truck thrown off the road into a ditch. The liner was ripped out of his vehicle. This occurred on May 16th, 1995 and was listed as an F0.

To understand losses better, one can look at Gage County, in which Beatrice resides. Gage County has had some costly tornado disasters strike in the past several decades. Table 5 shows the most costly tornados in Gage County from 1950 to 2006 along with Injuries reported. This data was obtained from the NCDC Storm Event database. The damages vary from no damage to \$20 million in damages on May 22nd, 2004 from the "Hallam Tornado."

| Date | Magnitude | Injuries | Property Damage |
|--------------------|-----------|----------|-----------------|
| August 2, 1953 | F2 | 0 | \$3,000 |
| May 29, 1956 | F2 | 0 | \$25,000 |
| July 3, 1958 | F2 | 1 | \$250,000 |
| July 3, 1959 | F1 | 0 | \$25,000 |
| June 9, 1967 | F2 | 2 | \$250,000 |
| July 14, 1970 | F2 | 0 | \$25,000 |
| September 25, 1973 | F3 | 8 | \$2,500,000 |
| June 2, 1975 | F2 | 0 | \$250,000 |
| April 23, 1976 | F1 | 0 | \$25,000 |
| July 6, 1978 | F2 | 0 | \$2,500,000 |
| July 5, 1984 | F1 | 0 | \$250,000 |
| April 26, 1991 | F3 | 0 | \$250,000 |
| April 26, 1991 | F2 | 0 | \$250,000 |
| July 1, 1994 | F0 | 0 | \$5,000,000 |
| May 8, 1996 | F2 | 15 | \$12,000,000 |
| April 11, 2001 | F1 | 0 | \$150,000 |
| April 11, 2001 | F2 | 2 | \$400,000 |
| September 7, 2001 | F1 | 0 | \$60,000 |
| May 22, 2004 | F4 | 0 | \$20,000,000 |
| April 15, 2006 | F2 | 0 | \$4,500,000 |

Table 5. Property Damage of Significant Tornadoes in Gage County

Vulnerability Assessment

Nebraska is listed by FEMA as the 5th state in terms of total number of tornadoes and while there have not been many major tornadic events in Beatrice, the probability of a major tornado striking Beatrice is equal to that of other areas in southeastern Nebraska. Tornadoes were determined by key personnel and public to be a “High” hazard risk and the City of Beatrice was determined to be “Severely” vulnerable to their effects.

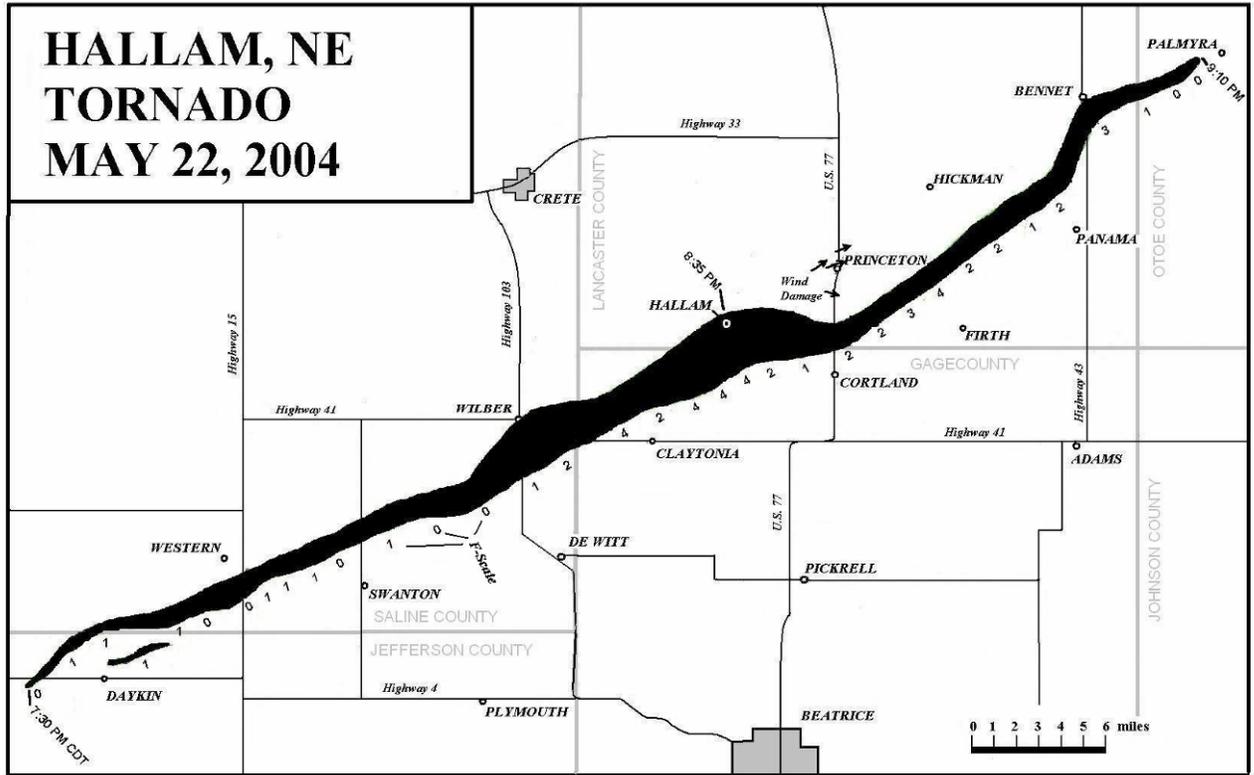


Figure 17. Path of the “Hallam Tornado” on May 22, 2004
Source: National Oceanic & Atmospheric Administration (NOAA)

The relative frequency of an F0 tornado occurring is 82%, while the relative frequency of a F5 occurring is less than 1%. In the event of a small F0 occurring, damage would be localized in the City of Beatrice, but with a large event, such as an F5, the whole City could be destroyed and its occupants displaced. Large tornado events such as that of Hallam should not be discounted as they could occur in Beatrice. Due to the unpredictable nature of tornados, the City of Beatrice and the surrounding community is very vulnerable to a tornadic event. For this reason, the whole City is within the hazard area boundaries, and the entire infrastructure including critical facilities, proposed and future structures can be damaged or destroyed from a tornadic event. The extreme wind and debris can destroy everything from trees and radio towers to cars and buildings. Along with this is the potential for loss of life. Loss of life will most likely not be as severe as it was prior to the 1960's and 70's; the forecasting and awareness programs since then have improved public awareness of tornado events. Although these programs are beneficial, they cannot prevent all loss of life. There are currently 10 emergency sirens that are tested monthly in Beatrice; they have a maximum of 1 mile coverage, which covers all structures in Beatrice. Below is a list of their locations, and they can also be seen in Figure 12.

1. City Auditorium, 4th and Ella
2. South 6th St, 6th and Marlborough
3. Country Club South 13h St, South 13th and Oak St.
4. State Hwy Maintenance Shop, Hwy 4 and Garden St.
5. Glenover Area, Ashland and Shuggart
6. 77 Livestock, 7th and Bauman
7. Astro Park, 18th and Hoyt St
8. Southeast Community College, West Scott and Hwy 136
9. V.F.W., 23rd and Market
10. Beatrice Sr. High School, Hwy 136 and Orange Blvd.

Potential Losses

Due to the irregularity of tornados and their varying degree of size and magnitude, it is not feasible to estimate accurately the potential losses of a tornadic event. The entire town is at risk from a tornado hazard. The total potential loss for the City of Beatrice could range from a few thousand dollars up to the total replacement value of the City at \$506 million (not including contents). This total replacement value comes from the Nebraska Department of Property Assessment and Taxation (2007). All of the structures in the City including critical facilities and future structures could be damaged or destroyed in the event of a tornado. Along with the monetary loss that could occur in the City, the loss of life could potentially be devastating. The value of life is not only disputed upon, but is also beyond the scope of this plan. In the event of a major tornado striking Beatrice, critical facilities could be destroyed along with vehicles and resources used by local medical, police, fire and rescue entities. Damages to contents and displacement would be very high as well if the entire town was struck by a tornado. There was not enough information to complete an accurate inventory of contents and displacement costs, but this information could be completed for future updates of this plan.

Severe Winter Storm

Hazard Profile

Severe winter storms are not uncommon in Nebraska, and Beatrice is no exception. The threat of winter storms is present every winter in Beatrice. Winter storms can bring extreme cold, freezing and snow. A blizzard can develop if wind accompanies this snow. Blizzards are particularly dangerous due to the drifting of snow and whiteout conditions. Generally, winter storms occur between the months of November and March, but can occur as early as October and as late as April. Heavy snow is probably the most defining entity of a winter storm. If there is a large amount of snow, it can put the community at a standstill. Snow can inhibit transportation, knock down tree limbs and utility lines along with cause structural damage to buildings.

Another entity of a severe winter storm is ice. Ice buildup on trees and power lines can cause them to collapse. This is especially true when ice comes in the form of freezing rain. Freezing rain begins as snow as it falls from high altitudes. The snow then completely melts as it passes through a layer of warm air, and then it becomes super cooled when it passes through a thin layer of cold air just before it impacts the surface. Since it is super cooled, it freezes on impact. Ice can also lead to many problems on the roads as it makes them slick, causing automobile accidents, and making vehicle travel very difficult.

Along with snow and freezes, extreme cold can be very dangerous to the well-being of people. Extreme cold can lead to hypothermia and frostbite and if exposed to it long enough, can cause loss of life. Hypothermia is a medical condition where a person's body temperature drops significantly below normal. This begins to occur when core body temperatures fall below 95 degrees Fahrenheit. This condition can lead to death if temperatures continue to fall. Frost bite is also a medical condition. Frost bite occurs when extreme cold causes damage to the skin and other tissues.



Figure 18. Example of Winter Storm
Source: Federal Emergency Management Agency (FEMA)

Historical Occurrence

Severe winter storms are often widespread, occurring over large areas. Many winter storms have occurred in the history of Nebraska over the years and data has been obtained from the NCDC Storm Event database. The winter storm events recorded by the NCDC Storm Event database contains all weather events from 1993 to 2005. For that period, Nebraska has sustained over \$106 million in property damage and over \$9 million in crop damage due to severe winter storms, extreme cold and freezes. Below is a list of some events that have occurred in Beatrice, although the events may have been more widespread than Beatrice alone so the corresponding loss estimates reflect the whole area of Southeastern Nebraska. Currently, there is no data available for damages for Beatrice alone.

- **January 26, 1994:** *Property Damage: \$50,000.* Freezing rain and sleet caused icing of trees and power lines. Some electrical outages also occurred.
- **January 4, 2005:** *2 Deaths reported. Monetary damages not known.* This storm dropped 8 to 14 inches of snow over most of eastern Nebraska and southwest Iowa, with over a foot reported across the Omaha metro area. In fact, 14.1 inches was recorded at Omaha Eppley from this storm, tying it for the 3rd heaviest snowstorm on record. The storm came through in two main bursts, the first started late Tuesday afternoon 1/4/05 and continued to around dawn Wednesday. The second bout of heavy snow fell from late Wednesday afternoon until around midnight that night. Toward the end of the snow Wednesday evening wind chill values fell to 10 below to 25 below zero as brisk north winds combined with temperatures that eventually fell to zero or colder. These bitterly cold wind chill values continued into early Thursday morning. The storm claimed 2 lives Tuesday night as a young couple became disoriented after leaving their stuck vehicle in a

rural area southwest of Omaha. Despite calls for help on their cell phone, they were unable to provide enough detail to be located before they collapsed and froze to death. The storm closed many schools across the region both Wednesday and Thursday. Besides the 14.1 inches recorded at Omaha Eppley, other heavier storm totals in eastern Nebraska included; 14.2 inches at the NWS in Valley, 12 inches in Fremont and Gretna, 11 inches at Uehling and 10 inches in David City, Raymond, Springfield, Weston, Plattsmouth, Bennington and Friend. Heavier amounts in southwest Iowa included; 12 inches at Little Sioux and Underwood, 11 inches in Harlan and Logan and 10 inches at Oakland.

- **October 22, 1996:** *Property Damage: \$3.2 million.* Five to eleven inches of heavy, wet snow blanketed the area. This combined with northerly winds which gusted as high as 46 mph caused widespread power and telephone outages and major tree damage. Fifteen percent of the sorghum was lost in Richardson, Pawnee, Nemaha, Johnson, and Otoe Counties.
- **October 25, 1997:** *Property Damage: \$56,500,000. Crop Damage: \$1,600,000.* A major early season snowstorm struck the area. A heavy wet snowfall of 6 to 14 inches fell on trees, many of which were still fully or partially leafed, and caused extensive damage and/or total destruction. At least 205,000 residents in the affected area were without power just after the storm, many of the outages lasted for several days. Omaha Public Power District estimated that it was the worst outage in 50 years. Nearly 85% of the trees in the Omaha area and 25% of the trees in the Lincoln area sustained damage or were totally destroyed. Many emergency shelters in and around the Omaha and Lincoln areas were opened for use by those who suffered a hardship from the storm.
- **March 7, 1998:** *Property Damage: \$26,000.* A major winter storm moved through the central plains and created near blizzard conditions over portions of eastern Nebraska. Heavy snow combined with strong northerly winds of 40-45 mph created considerable blowing snow with 6-15 foot snow drifts common. The heaviest snow fell in an area from Gage county northeast through the south and southeast portion of the Omaha metropolitan area where 11-16 inches of snow fell. Lesser amounts occurred further to the north with 4-6 inches at Norfolk. Schools and businesses were closed for a few days as the strong winds continued to cause blowing snow making the task of cleaning up very difficult.

Vulnerability Assessment

The City of Beatrice is vulnerable to severe winter storms in several ways. Large amounts of snow can cause trees to break, cause structural collapse of rooftops, and cause blockages of transportation routes. Snow and fallen tree limbs can also block transportation routes and prevent people from being able to get anywhere. With this, access to the hospital becomes difficult. Because there is a lack of snow fences in and around Beatrice, the drifting and blowing snow is not retained much. A winter storm with large amounts of snow could essentially shut the City of Beatrice down for a period of a few days.

Along with snow, freezing rain and ice buildup can also cause many of the same problems. The greatest vulnerability is the build up of ice on power lines causing them to break, which in turn could interrupt power service and interrupt communication. With power being out, residents of Beatrice could be without heat and be exposed to cold temperatures. These conditions can cause hypothermia, frostbite and loss of life if exposed to them for long periods of time. The vulnerability to the well-being of persons in Beatrice is very great with winter storms. Extreme cold can also freeze water mains, effect contents in storage tanks and congeal fuel in storage tanks and machinery that uses fuel. If the cold does not congeal fuel, vehicles such as airplanes and automobiles can cease working if the temperature drops below the minimum operating temperature. Medical, police, fire, and rescue entities could be prevented from assisting people

as heavy snow, ice and broken tree limbs can block transportation routes. Along with this problem of transportation is the vulnerability of accidents due to invisibility and icy roads. The extreme cold can also rupture water and sewer lines.

Severe Winter Storms were determined by Key Personnel and public to be a “Medium” hazard risk and the City of Beatrice was determined to be “Severely” vulnerable to their effects. The whole City of Beatrice is within the hazard area boundaries including the existing and future structures. The City does have a Snow and Ice Fighting Plan that identifies snow routes and provides instruction in the case of a severe winter storm event. Figure 19 shows the dedicated snow routes in the event of a severe winter storm.

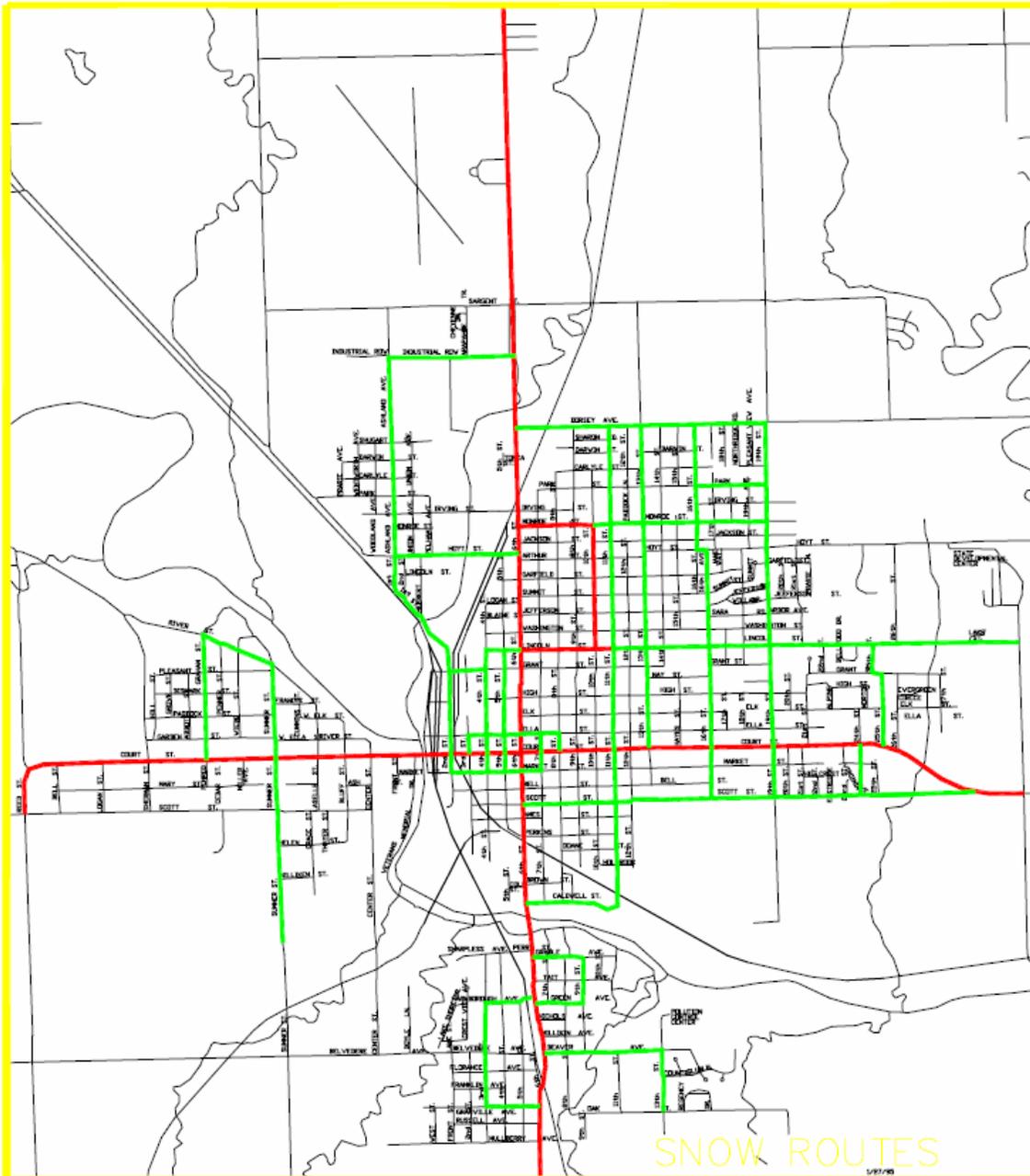


Figure 19. Snow Routes in Beatrice
Source: Beatrice Public Works Departments

Potential Losses

The potential losses associated with a severe winter storm are very hard to determine. The magnitude and frequency of severe winter storms vary widely. Due to the nature of severe winter storms, it is not feasible to estimate the potential loss of a winter storm event. Along with the monetary loss of structures and infrastructure, loss of life, functional loss, displacement time, and economic losses would be present. Having the City shut down with no power, inoperable vehicles and non-functional streets could lead to business and schools closing. Critical facilities could be rendered inoperable as well. Emergency crews that would be available to work would be small and they would have to work long hours exposing them to fatigue. Depending on when the winter storm occurred, a great loss could occur from loss of crops. Based on past events, the losses could range from no loss to millions of dollars in loss.

Flooding

Hazard Profile

Flood events are the most damaging and costly hazard in the United States. They are also the most common with almost 90 percent of presidential declared disasters being flood related. Flooding can occur on a local level, sometimes affecting only a few streets, and also on a regional level, affecting whole drainage basins and several states. A flood occurs when water, usually from rain or snow, overflows a waterway beyond its capacity. In some cases a flood could be defined when areas that do not have any defined waterway become covered in water. Flooding is most commonly caused by excessive rainfall and excessive snowmelt but can also be caused by ice jams. Flooding from excessive rainfall in Beatrice usually occurs in late summer and early fall.

Ice jams can cause flooding when there is a warmer period and the ice breaks up. This ice can then pile up against bridges and cause a temporary dam with water backing up behind it. This water backing up behind the ice jam can cause flooding. Also, when the ice jam breaks, it can release all the backed up water, causing a rush of water downstream which can cause severe flooding. Ice jams are common in the Midwest and Beatrice is no exception.

Crucial to the location of Beatrice is the Big Blue River. From the very beginning, the site was defined in terms of the bend that results in the river traveling through the community on both the west and south sides. Indian Creek is also included within Beatrice, traveling from the northeast to join the Big Blue River near the Court Street Bridge on the west edge of downtown Beatrice.



Figure 20. Flooding in Beatrice on May 7th, 2007 West of Big Blue River
Source: JEO Consulting Group, Inc.

Historical Occurrence

Key personnel and public participants recorded that there have been previous occurrences of flooding in or around Beatrice. One major rainstorm event recorded by Citizens was in July 2001. It was also reported that severe flooding has caused access to be cut off at the bridges in Beatrice. The NCDC Storm Event database reports since 1990 that various flash floods have occurred the following dates in Beatrice:

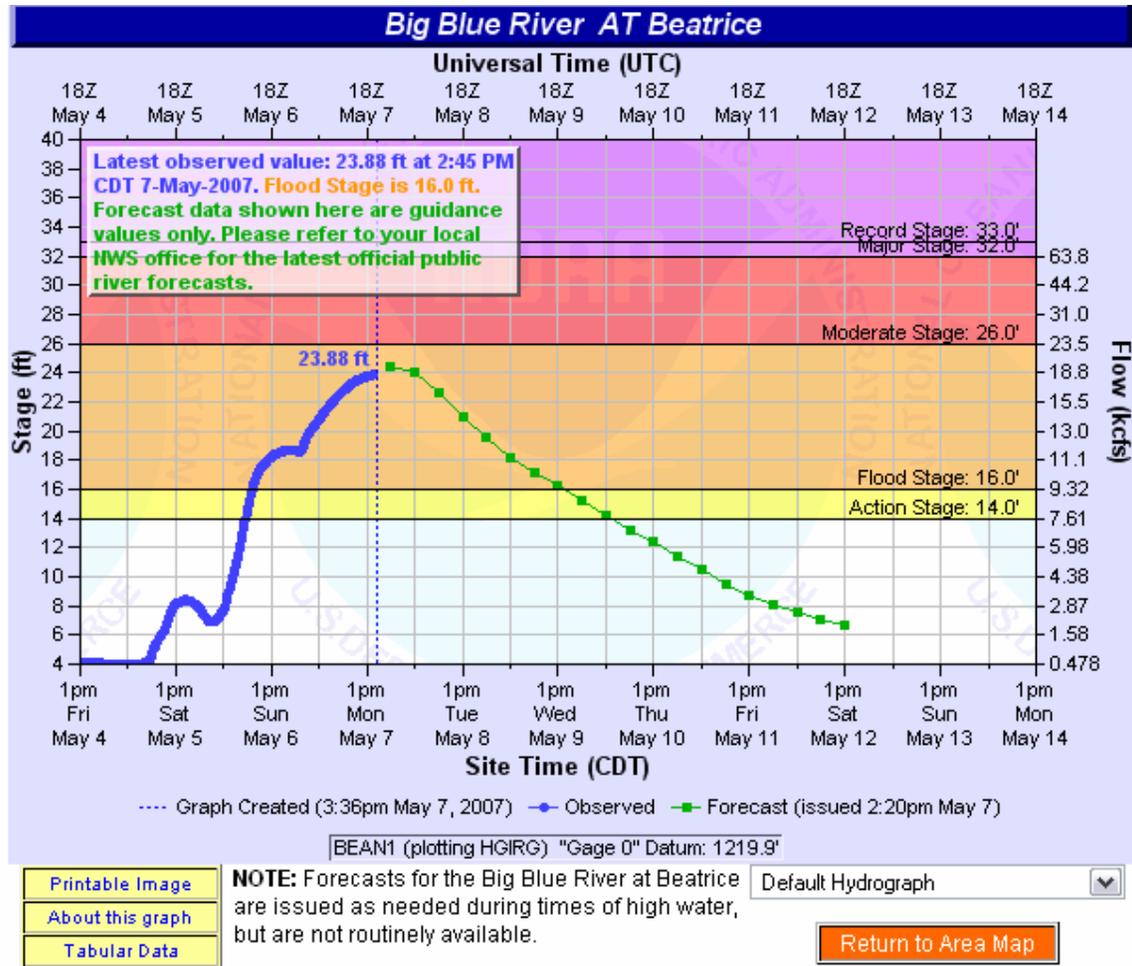
- May 8, 1996: Heavy rains of 1 to 3 inches fell over already saturated ground.
- May 23, 1996: Heavy rains of 2 to 4 inches fell over the Little and Big Blue River basins.
- July 10, 1997: Heavy rains enveloped a grain elevator and washed out a section of railroad tracks next to it.
- May 20, 1999: Flooding of many county roads and 100 feet of dirt was washed out under rail road tracks near Beatrice.
- May 30, 1999: Street flooding in Beatrice plus county roads around town closed as well due to flooding. County road east of Beatrice closed due to flooding.
- July 28, 2001: Heavy rains caused significant street flooding in Beatrice.
- May 28, 2002: Numerous county roads were covered by water around Beatrice.

The Big Blue River has flooded in 41 of the last 125 years of its history according to records kept by the Beatrice Historian. There are no records of floods before 1882. During that 125-year time period, the river has crested above 26 feet six times (1897, 1903, 1911, 1947, and 1973.) The floods have changed the face of Beatrice. In terms of past mitigation efforts: An early cemetery was moved in the 1900s, a factory moved in the early 20th century and during the past 30+ years, the City has methodically relocated people out of flood plain areas, resulting in more park and recreation land on the west and south side of town.

During the time of this plan, a recent flood occurred in Beatrice on May 7th 2007. Figure 20 shows what it looked like during the peak of river. This picture is taken from Hwy 136 on the West side of the Big Blue River looking to the southwest. Figure 21 shows the stage-discharge curve for the Big Blue River during this time. This flood caused Hwy 136 to be shut down flooding occurred at various locations across town. As this plan is being written, the extents of the damages are being assessed and can be included in the next plan update. Flood stage for the Big Blue River is 16.0 ft and it crested around 24.0 ft during this storm.

Statement of Future Vulnerability

In the Beatrice Comprehensive Plan, Beatrice does not intend to ever develop in the area of the 100-year floodplain. On page 14 of this plan, a map showing future land usage shows that the land in the floodplain will only be used for "conservation reserve" (or parks) and "river corridor". These future growth patterns show that there is no growth in the flooding hazard prone area. Furthermore, there is to be no structures, infrastructure, or critical facilities to be built in this area. The vulnerability of flooding in terms of future buildings, infrastructure and critical facilities will be none.



Flood Categories (in feet)

| | |
|-----------------------|----|
| Major Flood Stage: | 32 |
| Moderate Flood Stage: | 26 |
| Flood Stage: | 16 |
| Action Stage: | 14 |

- Historical Crests**
- 33.02 ft on 10/12/1973
 - 31.27 ft on 06/14/1984
 - 28.77 ft on 07/26/1993
 - 28.30 ft on 06/04/1951
 - 27.65 ft on 06/23/1947
- [Show More Historical Crests](#)

- Low Water Records**
- 0 ft on 08/15/1976
 - 0 ft on 07/14/1981
 - 0 ft on 07/23/1980
 - 0 ft on 11/28/1976
 - 0 ft on 06/28/1988

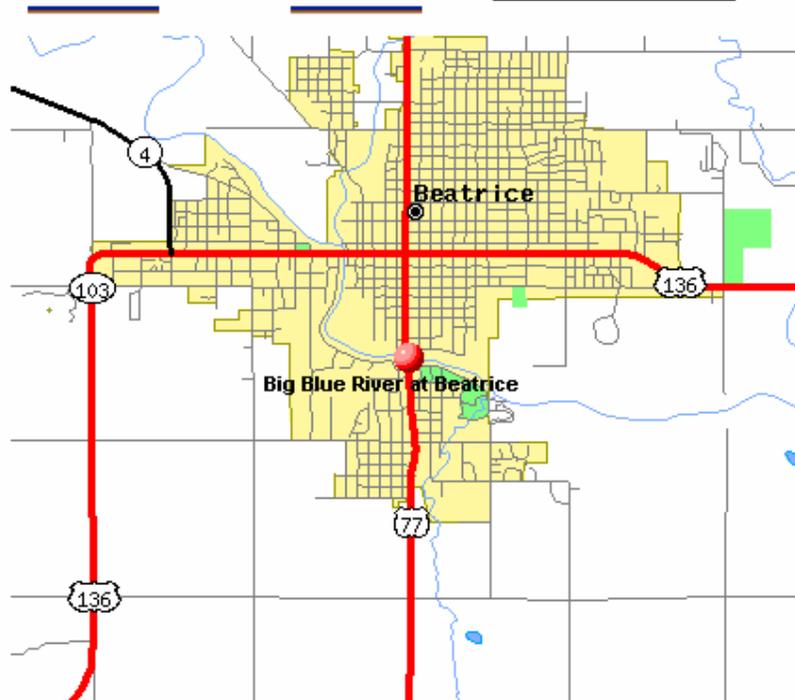


Figure 21. Stage-Discharge Curve for Big Blue River on May 7th, 2007

Vulnerability Assessment

Flooding was determined by Key Personnel and public to be a “Medium” hazard risk and the City of Beatrice’s vulnerability was determined to be “Limited” to its effects due to the proximity of where flooding occurs. Key personnel and the public identified that Beatrice is susceptible to Flooding events.

In the event of a flood, structures in the floodplain, along with their contents could be damaged or destroyed. Furthermore, this could create vulnerability to the economy of the community, human safety and displacement. A flood event could also cause loss of life and could destroy transportation infrastructure. A flood would at least create road closures and cause transportation problems. Emergency workers could be prevented from accessing people, power and utilities could be shut down or destroyed, and debris could litter the area.

It was determined that the hazard area boundaries for flooding are the boundaries determined by the estimated floodplain as shown in Figure 12 located under the *Structural Inventory and Critical Facilities* portion of this section. Figure 12 shows the Structural Inventory with the estimated 100-Year Flood Boundaries. Also included in this section is a list and description of the structure types classified in the structural inventory. This map shows the estimated floodplain in blue, and identifies the different structure types. The structure types include: churches, commercial structures, out structures, public structures, residential structures, and schools. All of the structures in the estimated floodplain are vulnerable. Table 6 shows the number and types of structures in the estimated floodplain.

The estimated Flood Boundary is based off of FEMA’s Flood Insurance Rate Map (FIRM), however the actual FIRM should be used for further investigation, as the estimated floodplain is not as accurate. It was generated to get an estimate on the number of structures within the 100-Year Flood Boundaries. For actual 100-Year Flood Boundaries see the actual FIRM map, revised in January 3rd, 1985, in Appendix C. This floodplain was used for vulnerability assessment and loss estimation. The structures within the boundaries are susceptible from flooding from the Big Blue River. There can also develop localized flooding cases in the event of a large rainfall event. If the current stormwater systems do not have sufficient capacity to handle the run-off, localized flooding can occur. Due to limited resources, investigation of individual structures that experience localized flooding was not done. This could be included in future updates of the plan.

The structural inventory combined with the estimated floodplain identified 357 Structures, including 11 critical facilities, in the 100-Year Flood Boundary that are vulnerable, see Table 6 for a break down of these structures.

Potential Losses

The potential losses associated with a flood event could vary greatly depending on the severity of the flood. If the flood were severe, structures could be entirely destroyed and there could be great economic loss. If the flood event were minor, there might only be debris scattered throughout the river area.

Table 6 shows a summary of the structures in the 100-Year Flood Boundaries. These structures and their contents could be damaged or destroyed in the event of a flood. Future structures in this zone could also be damaged or destroyed. From the definitions of Critical Facilities as defined earlier, there are 11 critical facilities in the estimated floodplain.

| Type | Number of Structures |
|------------------------|----------------------|
| Churches | 1 |
| Commercial Structures | 41 |
| Out Structures | 37 |
| Public Structures | 10 |
| Residential Structures | 268 |
| Public Schools | 0 |
| Total | 357 |

Table 6. Structures in Estimated Floodplain

The Actual Valuation of the City of Beatrice was used to determine the average replacement value of the buildings in the City of Beatrice. As described in the *Structural Inventory and Critical Facilities* section on page 21, Nebraska Department of Property Assessment and Taxation (2007) recorded that the total replacement value of the entire City is \$506 million. Using average valuation data for each structure type as discussed earlier in *Structural Inventory and Critical Facilities* section, the total assets vulnerable to flooding can be estimated as follows:

| | Per Structure | Number | Total Value | Approximate Damage Value |
|-------------------------|---------------|------------|---------------------|--------------------------|
| Public -owned: | \$43,921 | 11 | \$483,131 | \$96,626 |
| Commercial Structures: | \$238,688 | 41 | \$9,786,208 | \$1,957,241 |
| Residential Structures: | \$72,849 | 268 | \$19,523,532 | \$3,904,706 |
| Out Structures: | \$5,524 | 37 | \$204,388 | \$40,877 |
| TOTAL: | | 357 | \$29,997,259 | \$5,999,451 |

The total replacement value of all the buildings within the estimated floodplain was calculated at \$29,997,259 provided that 357 structures were identified in the estimated floodplain. It should be noted that this number includes the out buildings.

For this plan, it was estimated that all of the structures in the flood zone area sustain 20% building damage with a flood depth of 2 ft. This is from the Flood Building Loss Estimation Table provided by the FEMA Benefit-Cost Analysis Full Data Module. Evaluation was based on the average of one or two story buildings with basements. Using this estimated flood event, the potential building damage losses to Beatrice would be \$5,999,451.

Due to the lack of resources, an estimated potential dollar loss to individual vulnerable structures was not completed for this plan. An estimate of losses for the identified structures and more detailed information such as the 1st floor elevations of structures can be completed for the next plan update. See the Implementation section of this plan for details.

Nebraska Department of Natural Resources was contacted to see if there were any existing buildings, infrastructure, and/or critical facilities that are classified as Repetitive Loss Structures. For the City of Beatrice, there are no current Repetitive Loss Structures; they have all been mitigated as of February 2008 (See *Structural Inventory and Critical Facilities* Section on page 21). Furthermore, Beatrice is not a CRS community.

Drought

Hazard Profile

A drought is an extremely dry period in a region where the water availability drops below the regions requirements. Often, extreme heat accompanies a drought. However, extreme heat will be covered later in this report as it can occur separately. Wildfires are also more likely to occur during periods of drought, but they are not considered in this plan. Droughts are affected by natural processes, natural water availability and also human demands on water supply. Because of demands on water supply, droughts have huge political social, economical and environmental impacts. Droughts can be brought on by four different conditions according to the National Weather Service:

- **Metrological Drought:** Brought about when there is a prolonged period with below average precipitation.
- **Agricultural Drought:** Brought about when there is not enough moisture to produce average crop or range production. This situation can arise even when the area of interest receives average precipitation. This is due to soil conditions and agricultural techniques.
- **Hydrologic Drought:** Brought about when water available in aquifers, lakes, and reservoirs falls below the statistical average. This situation can arise even where the area of interest receives average precipitation. This is due to the reserves diminishing from increased water usage usually from agricultural use.
- **Socioeconomic:** Brought about when the demand for water is greater than the supply. This can be caused by an increase in demand and/or reduction in supply.

Depending on the severity, droughts can have major consequences that are wide spread. Droughts can cause environmental consequences such as wildfires, disease, thirst and famine due to lack of water and crops from insufficient irrigation. Often people migrate or relocate in search of more promising lands. In extreme cases, social unrest and war can break out because of the politics often tied with water.

Historical Occurrence

The key personnel and members attending public meetings agreed that the City of Beatrice is an area that has been affected by drought historically. Figure 22 shows the NOAA's seasonal drought prediction through October of 2006; Beatrice is on the edge of the area determined as: "Drought ongoing, some improvement." See <http://www.drought.noaa.gov/> for the latest information on drought prediction.

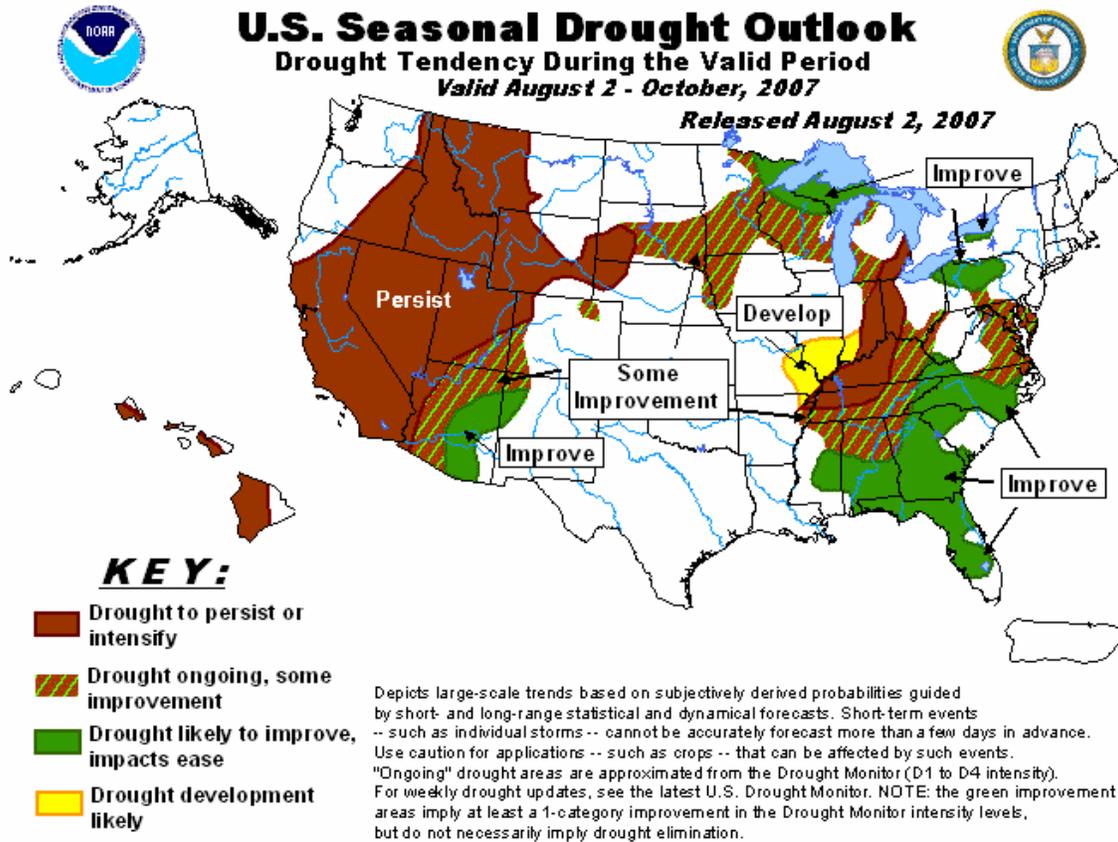


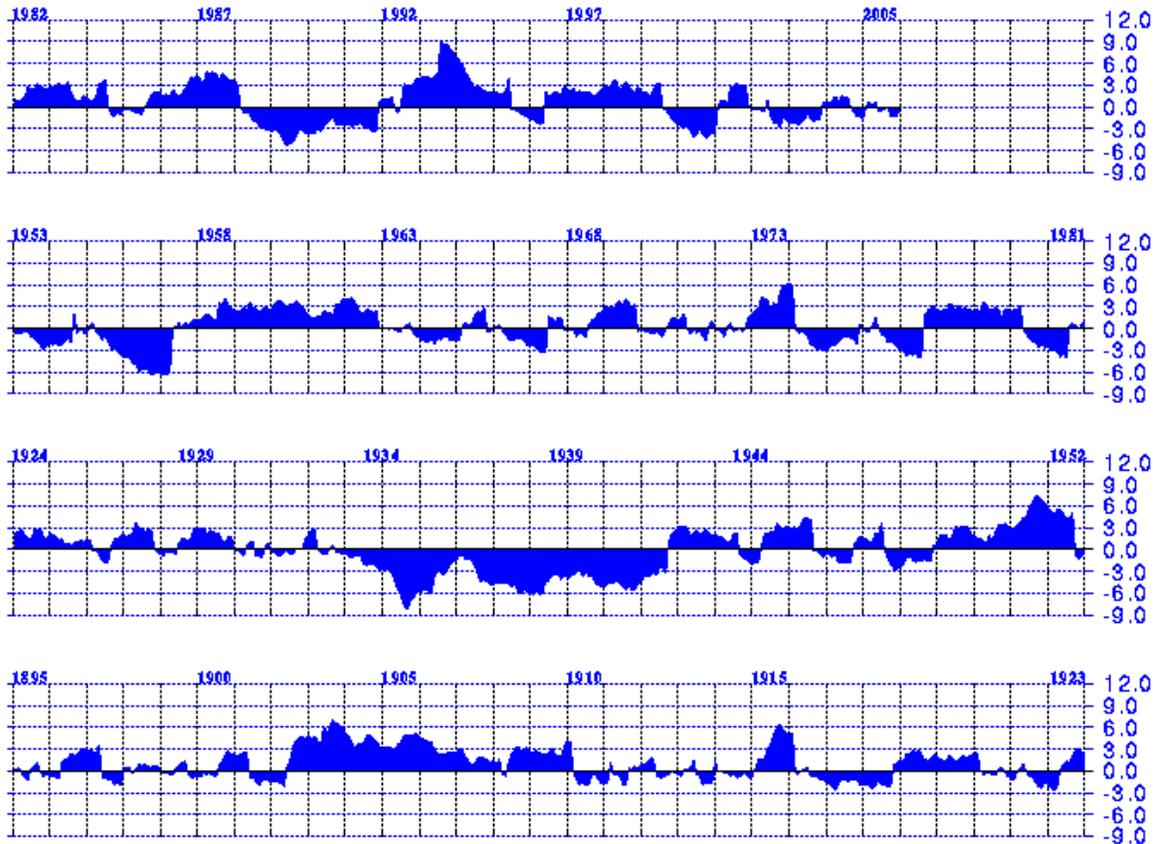
Figure 22. U.S. Seasonal Drought Outlook through October 2007
Source: NOAA

The most famous series of droughts in the United States occurred between 1930 and 1937 and is commonly referred to as the Dust Bowl. During this time period known as the Great Depression, drought had major impacts on the United States causing entire districts of the American Great Plains to be depopulated

When droughts occur in Beatrice, they are usually part of a larger pattern of drought conditions in the Great Plains and upper Midwest. One example of this is the Northern Plains Drought during the summer of 1989. This was a severe drought over much of the northern plains with significant losses to agriculture. It is estimated that at least \$1.0 billion in damage and costs occurred, although there were no reported deaths.

In 2006, the Nebraska Department of Agriculture distributed \$3.6 million for drought assistance in agriculture. Also in 2006, the University of Nebraska estimated drought cost the State \$360 million that year. Below, in Figure 23, shows the severity of drought since 1895 in Division 9 of Nebraska, this is Beatrice's Division. The figure uses the Palmer Drought Severity Index where -2 equivalents a moderate drought, -3 a severe one, and -4 corresponds to an extreme drought. This information is taken from the National Climatic Data Center (NCDC) using their Climate Visualization System (CLIMVIS). The NCDC is controlled by the National Environmental Satellite Data, and Information Service (NESDIS).

Palmer Drought Severity Index



Nebraska - Division 09: 1895-2005 (Monthly Averages)

Figure 23. Palmer Drought Severity Index for Beatrice since 1895
Source: NCDC

Vulnerability Assessment

Beatrice, along with much of the Midwest is vulnerable to drought. Given the history of them in the Midwest, the varying severity of them, and the problems and losses that accompany them, Drought was determined by Key Personnel and public to be a “High” hazard risk and the City of Beatrice’s vulnerability was determined to be “Severe” to its effects. The whole region of Beatrice is within the hazard area boundaries. Droughts have many widespread affects on communities and often nations. Overall they can negatively impact economics, social structure, and environment. Usually all three are associated with a drought. The farming community in and around Beatrice is vulnerable to a water shortage where water levels become too low. In the case of a water shortage, Beatrice’s water supply would dwindle and the quality of the water would be in danger due to the high levels of nitrates and other chemicals that would develop in the water supply.

Because there are a large number of farmers in and around Beatrice, a drought would greatly impact them and the community. Because agricultural use accounts for the majority of the water usage, the agricultural industry would suffer in the case of a drought. A drought would impact livestock as well. As a result, this effect could decrease spending and tax revenue for the City of Beatrice and neighboring communities. Along with these implications of a drought event occurring in Beatrice, is the effect on the social fabric of the community. In the event of a

drought, water conservation measures could be put into place limiting people from watering their lawns, and allowing farmers to do so. This could damage or destroy the social fabric of the community.

Potential Losses

The potential losses associated with a drought are very hard to determine. The magnitude and frequency of droughts vary widely and they are usually part of a larger pattern of drought conditions on a regional level. The losses are generally associated with the drought and not each town that they pertain too. It is not feasible to accurately estimate the potential loss of a drought event for the City of Beatrice. Along with the monetary loss of crops and livestock, environmental losses, economic losses, and losses associated with disruption of social structure would be present. The potential for loss of life is also present and a devastating drought could cause an outward migration of people. It is very difficult and beyond the scope of this plan to determine the monetary loss of an outward migration, disruptions to social structure, and loss of life.

A drought that affects the City of Beatrice could cost hundreds of millions of dollars across the State of Nebraska as it did in 2006. Because droughts occur on such a large scale, there is not enough specific information to determine exactly the damages to Beatrice alone. This information, if available, could be included in future updates of the plan.

Extreme Heat

Hazard Profile

Extreme heat is often associated with periods of drought. It is characterized by long periods of high temperatures and is made worse with high humidity. In these conditions, the human body has a hard time cooling itself off by evaporation. The danger arises when a victim is overexposed to heat or has over-exercised for his or her age. Older adults, young children, the sick and the overweight are more susceptible to injury from extreme heat. Heat stroke, heat exhaustion, heat cramps, and sunburn can occur, and in extreme cases, loss of life can occur. In the last thirty years more people in the United States have died from extreme heat than from earthquakes, hurricanes, floods, lightning, and tornadoes combined. People living in urban areas and/or without air conditioning are at greater risk of suffering from heat. For the purposes of this report, extreme heat is considered a separate hazard than drought as sometimes a drought can occur without any extreme heat events. Similarly, periods of extreme heat can occur without a drought ever occurring. Extreme heat can also be a cause of a wildfire. Wildfires are not covered in this plan.

Historical Occurrence

The key personnel and public recorded that there have been previous occurrences of extreme heat in or around Beatrice although no specific instances were obtained. There is a possible correlation between extreme heat and drought that occurs in and around Beatrice. Historical occurrences of extreme heat are generally not recorded as the definition of extreme heat is loosely defined. The maximum temperatures that are discussed in the *Community Profile* portion of Section 3, earlier in this plan and can provide insight.

Vulnerability Assessment

Extreme Heat was determined by Key Personnel and public to be a "High" hazard risk and the City's vulnerability was determined to be "Limited". They have identified the risk of extreme heat being present in Beatrice. The whole City of Beatrice is within the hazard study area. Beatrice, like many communities in the Midwest is vulnerable to extreme heat. Young children, elderly and people living and working in environments without air conditioning are more vulnerable than

Dam Failure

Hazard Profile

This type of hazard is described as a structural failure of a water impounding structure. Structural failure can occur during extreme conditions; these extreme conditions include but are not limited to:

- Reservoir inflows in excess of design flows
- Flood pools higher than previously attained
- Unexpected drop in pool level
- Pool near maximum level and rising
- Excessive rainfall or snowmelt
- Large discharge through spillway
- Erosion, landslide, seepage, settlement, and cracks in the dam or area
- Earthquake

The Nebraska Department of Natural Resources (NDNR) is in charge of dam safety for Nebraska. NDNR classifies dams by the potential hazard each poses to human life and economic loss. Following are the classifications and descriptions of each hazard class:

High hazard potential means a hazard potential classification such that failure or misoperation of the dam resulting in loss of human life is probable.

Significant hazard potential means a hazard potential classification such that failure or misoperation of the dam would result in no probable loss of human life but could result in major economic loss, environmental damage, or disruption of lifeline facilities.

Low hazard potential means a hazard potential classification such that failure or misoperation of the dam would result in no probable loss of human life and in low economic loss.

Minimal hazard potential means a hazard potential classification such that failure or misoperation of the dam would likely result in no economic loss beyond the cost of the structure itself and losses principally limited to the owner's property.

Dams that are classified as High Hazard require an Emergency Action Plan (EAP) to be created. The EAP defines responsibilities and provides procedures designed to identify unusual and unlikely conditions which may endanger the structural integrity of the dam in time to take mitigate action and to notify the appropriate emergency management officials of possible, impending, or actual failure of the dam. The plan may also be used to provide notification when flood releases will create major flooding. An emergency situation can occur at anytime; however, emergencies are more likely to happen when extreme conditions are present.

The plans include notification information that expedites the information to proper entities so proper action can be taken to prevent the loss of life and property. Local entities that are included in some EAPs include but are not limited to:

- 911 Dispatch
- County Sheriff
- Local Fire Department
- Emergency Management Agency Director
- County Highway Department
- National Weather Service

Historical Occurrence

Data from the DNR indicates there have been no Dam Failures upstream of Beatrice. The Key Personnel and citizens of Beatrice concur. There are no other sources indicating any dam failures above Beatrice.

Vulnerability Assessment / Potential Losses

Dam Failure was determined by Key Personnel and public to be a “Low” hazard risk and the City’s vulnerability was determined to be “Limited”.

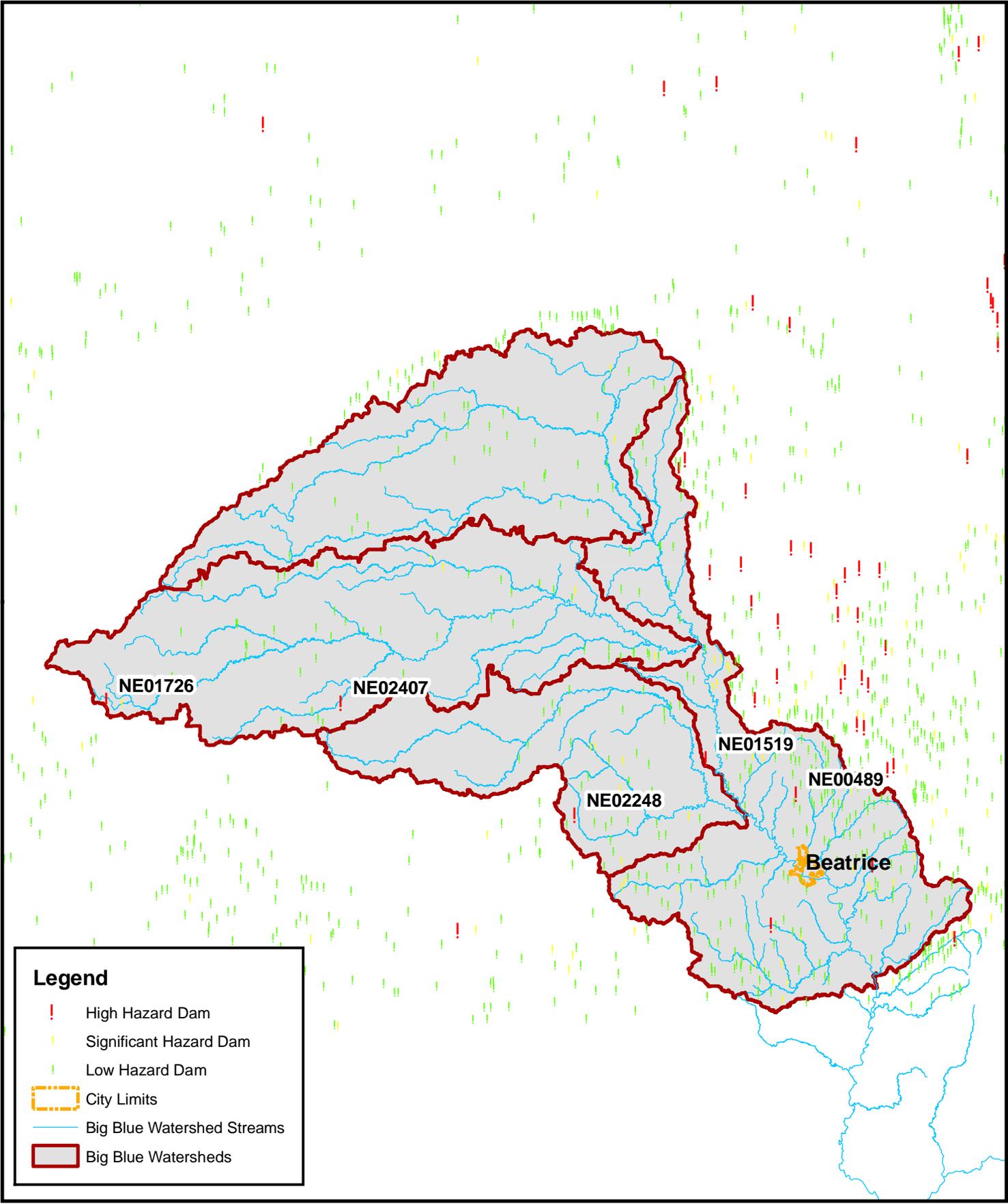
After reviewing a NDNR dam database, five (5) high hazard dams were discovered to be upstream of the City of Beatrice. Discussions with NDNR revealed the areas that would be inundated, due to a failure of one of the high hazard dams, would remain significantly upstream of Beatrice and have a negligible effect on the City. Negligible effects include an inundation area that is contained within the 100-yr floodplain; therefore, if any effects due to a dam failure are observed, said effects would be similar to a flood. The effects and damages of flooding are covered under the “Flooding” Section of this report. Therefore, the vulnerability of Beatrice to Dam Failure is negligible and potential losses are none.

Figure 25 shows the Low, Significant and High Hazard Dams upstream of Beatrice. The five high hazard dams, listed by their State Identification Number are as follows:

| NIDID | Dam Name | County | Year Completed |
|--------------|-------------------|---------------|-----------------------|
| NE01726 | Hastings NW Dam | Adams | 1980 |
| NE02407 | Structure 2-7-5W | Clay | 1994 |
| NE02248 | Swan Creek 20 | Saline | 1987 |
| NE01519 | Wilber Dam No 1 | Saline | 1975 |
| NE00489 | Indian Creek 15-A | Gage | 1955 |

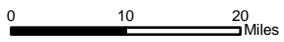
It shall be noted that the inundation maps for the above five dams are not available for public viewing due to the concerns of terrorist attacks. More detailed information can be sought after through the Nebraska Department of Natural Resources.

All dams are inspected on a regular basis and after extreme conditions have been occurred. If problems are found during an inspection, the proper course of action is taken to ensure the structural integrity of the dam is preserved. In the event that dam failure is imminent, the EAP for the dam governs the course of action.



Legend

- ! High Hazard Dam
- ! Significant Hazard Dam
- ! Low Hazard Dam
- City Limits
- Big Blue Watershed Streams
- Big Blue Watersheds



**City of Beatrice, NE
- Beatrice Hazard Mitigation Plan -
Figure 25: Dam Inventory**



Earthquake

Hazard Profile

In Nebraska, Earthquakes do occur. However they are not common and when they do occur, they are small and produce little to no damage. Earthquakes are measured by their magnitude and intensity. Magnitude is measured using the Richter Scale and uses seismographs around the world to measure the amount of energy released by the quake. The Richter scale is a base-10 logarithmic scale. Intensity uses the Modified Mercalli Intensity Scale and is determined by comparing actual damage against the damage patterns of earthquakes with known intensities.

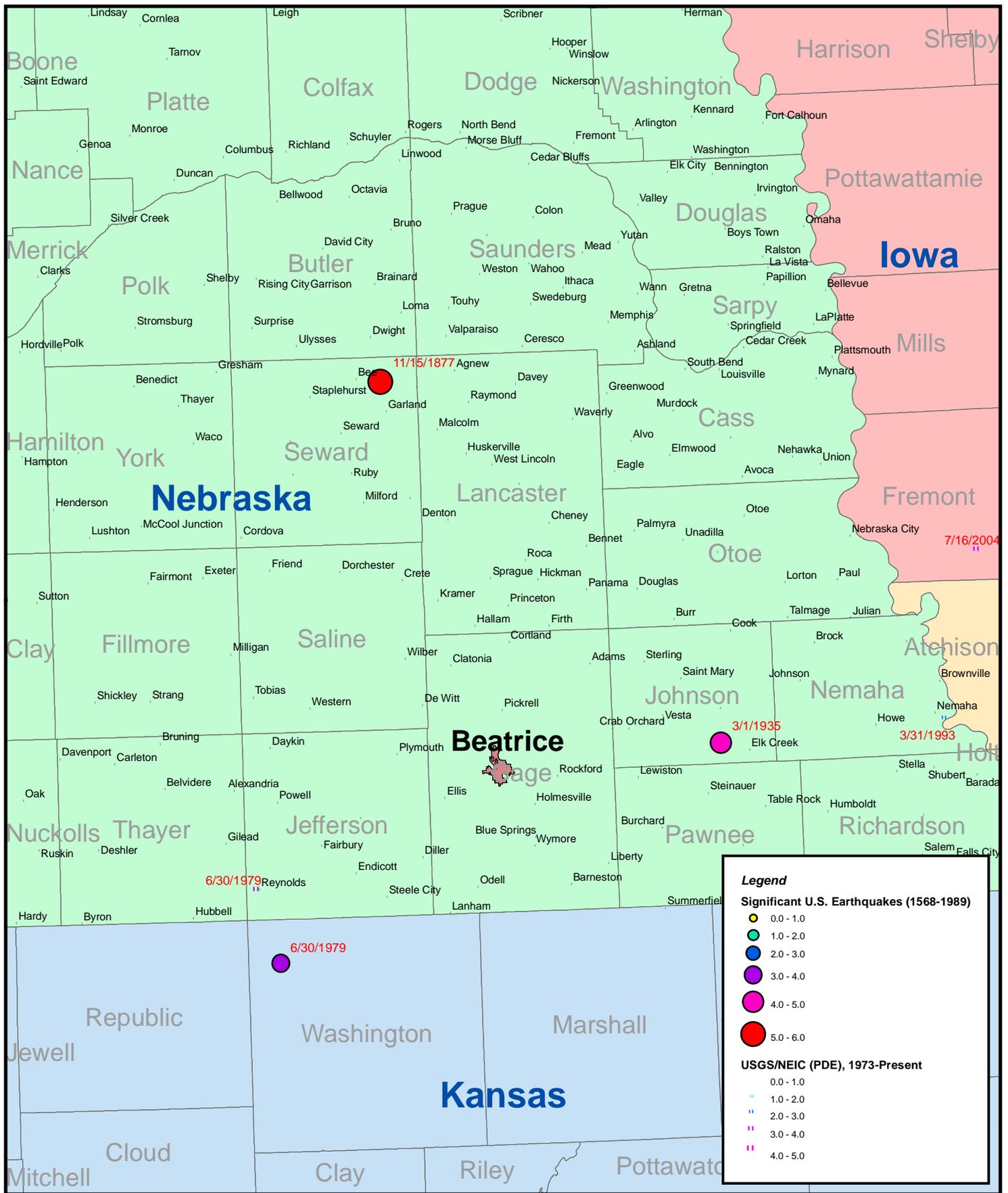
From USGS documents, the typical effects of the various magnitudes of the Richter Scale are as such:

| Richter Magnitude | Description | Earthquakes Effects |
|--------------------------|--------------------|--|
| 0.0 – 2.0 | Micro | Microearthquakes, not felt. |
| 2.0 – 2.9 | Minor | Generally not felt, but recorded. |
| 3.0 – 3.9 | Minor | Often felt, but rarely causes damage |
| 4.0 – 4.9 | Light | Noticeable shaking of indoor items. Significant damage unlikely. |
| 5.0 – 5.9 | Moderate | Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings. |
| 6.0 – 6.9 | Strong | Can be destructive in areas up to about 100 miles across in populated areas. |
| 7.0 – 7.9 | Major | Can cause serious damage over larger areas. |
| 8.0 – 8.9 | Great | Can cause serious damage in areas of several hundred miles. |
| 9.0 – 9.9 | Great | Devastating in areas several thousand miles across. |
| 10.0+ | Great | Never recorded. Energy Yield extremely high. |

Historical Occurrence

On the following page, in Figure 26, the map shows the Earthquakes that have occurred around Beatrice. The information is from the USGS Earthquake Hazards Program, more specifically the NEIC Earthquake Search database. Two sets of Earthquake data are listed. The circles in the figure are *Significant U.S. Earthquakes from 1568-1989*. This is a catalog of principal earthquakes in the United States for that time period which have magnitudes greater than or equal to 4.5 or intensity of VI or larger. The Squares on the figure are from the catalog of earthquakes located by the USGS NEIC and its predecessors. This data is available from 1973 to the present.

From the database, it can be seen that there was an earthquake North of Garland, NE on 11/15/1877 that registered a 5.1 on the Richter scale. The only other earthquake of significant magnitude occurred east of Beatrice about 30 miles on March 1st, 1935. This earthquake event was actually two earthquakes that occurred 4 minutes apart between 4.0 and 5.0 on the Richter scale. During this event, some chimneys were cracked and a few collapsed. A few windows were also broken and cracks appeared in the plaster and stone walls. The damages occurred in Tecumseh as well as Humboldt, Pawnee City, Peru, Shubert, Stella, and St. Marys Nebraska. See figure for other earthquakes around Beatrice, their year, and magnitude.



Vulnerability Assessment / Potential Losses

Earthquakes were determined by Key Personnel and public to be a “Low” hazard risk and the City’s vulnerability was determined to be “Limited”. Although there is an earthquake risk in Beatrice, all available information indicates that there is very limited vulnerability. In Southeastern Nebraska, where Beatrice is located, there has not been a measurable earthquake of any kind for over 70 years. Furthermore, the rare earthquakes which have occurred have produced very light to negligible structural damage. Due to this and limited resources, it was not deemed appropriate to assess the vulnerability of specific structures which are vulnerable to earthquakes or examine the potential losses from an earthquake event. Furthermore, due to the lack of sufficient earthquake data, it is not feasible to accurately estimate the potential losses of an earthquake event. Also due to this extremely low risk, earthquake mitigation projects are not economically, nor politically feasible.

Section 5: Mitigation Strategy

Introduction

After the hazards were identified, the key personnel and general public used the information to develop goals and strategies for the City of Beatrice. This aspect of a Hazard Mitigation Plan is important as it takes into account the risks associated with the hazards and identifies ways to reduce or eliminate those risks. In this stage of the plan, the key personnel and those attending the public meeting develops general overall goals and more specific, objectives for each goal. To address the goals and objectives, "Mitigation Alternatives", or "Actions" are then developed. A second task force meeting and public meeting was held on June 18th, 2007 for completion of this phase of the plan prior to approval and adoption.

Development of Goals

The meeting held was open to public input and involvement as well as the input and involvement from outside communities. Refer to the *Public Participation* portion of Section 2 in the beginning of this plan for more discussion on public participation. The meeting was held after the initial draft of the plan was completed, and the findings were discussed. From the risk assessment, attendants were able to learn and add to specific things about the historical events of the hazards, the vulnerability of the community, and the potential losses from an event occurring. Parties attending were able to review the current processes of the City and analyze the City's capabilities. A sign in sheet of the parties that attended the meeting is shown in Appendix B. They were also able to review previous plans and studies done for Beatrice and the surrounding areas including:

- Comprehensive Development Plan for The City of Beatrice
- Beatrice Community Facts book
- Beatrice Snow Emergency Plan
- Subdivision Ordinances
- Zoning Ordinances
- Building Codes
- Beatrice Drainage study
- Gage County Local Emergency Operations Plan

A basic list of Goals and Objectives were provided at this second meeting to get discussion initiated. The parties attending were directed to use or revise statements provided as well as contribute new ones of their own. During the meeting, parties attending contributed their thoughts and were guided to finalize goals and objectives. Discussion was held and some of the goals were noted as objectives, potential projects and alternatives. It was discussed how goals are general guidelines that portray what the City of Beatrice is striving to achieve and that they are global and general ideas. It was discussed as well that objectives are more specific in that they identify strategies and implementation steps that are required to achieve the goals.

Final goal statements were first formed and from this point the meeting attendants worked to develop and refine objectives to eventually help develop alternatives to meet each goal and objective. Below is the final list of the goals and objectives as determined by the public and key personnel. These goals and objectives provide specific direction for the City of Beatrice for reducing future hazard related losses. The goals, objectives were organized in a numbering system to keep them organize and to assist in the development and organization of Mitigation Alternatives, as discussed late.

Goal 1: Protect the Health and Safety of Residents

(Overall purpose of plan)

Goal 2: Reduce Future Losses from Hazard Events

Objective 2.1: Provide protection for existing structures, future development, critical facilities, services, utilities and trees to the extent possible.

Objective 2.2: Develop hazard specific plans, conduct studies or assessments, and retrofit City to mitigate for hazards and minimize their impact.

Objective 2.3: Minimize and control the impact of hazard events through enacting or updating ordinances, permits, laws or regulations.

Goal 3: Increase Public Awareness and Educate on the Vulnerability to Hazards

Objective 3.1: Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects of them may be, where they occur, and what they can do to be better prepared.

Goal 4: Improve Emergency Management Capabilities

Objective 4.1: Develop or improve City and/or County Emergency Response Plan and procedures and abilities.

Objective 4.2: Develop or improve Evacuation Plan and procedures.

Objective 4.3: Improve warning systems and ability to communicate to residents and businesses during and following a disaster or emergency.

Goal 5: Pursue Multi-Objective Opportunities Whenever Possible

Objective 5.1: When possible, use existing resources, agencies, and programs to implement the projects.

Objective 5.2: When possible implement projects that achieve several goals.

Mitigation Alternatives

After the goals and objectives were determined, the actual “alternatives”, “activities”, or “actions” were decided upon. These projects are the heart of hazard mitigation planning as they can be used as a guide for the community to take a pro-active approach toward hazard planning. A preliminary list initially organized by hazard type and developed by JEO Consulting Group was provided to the parties attending the meeting. The attendants of the public meeting were then given an opportunity to then add or subtract from the list or revise any. Discussion was facilitated to ensure an understanding of the criteria that should be used when deciding on alternatives.

The criteria were that the alternatives must be related to the goals and objectives developed previously. The alternatives must be specific activities that are concise and can be implemented individually, without confusion. The list distributed to all members attending the public meeting and to key personnel not able to attend the public meeting. After alternatives were added, subtracted, and revised, they were organized by goals and objectives. The goals, objectives and corresponding actions were then arranged using a numbering system to keep track of them in the future. The list of alternatives as actions arranged by goal and objective can be seen in Appendix A and is discussed further below.

After the mitigation alternatives were finalized, it was described to attendants that the alternatives or actions need to be prioritized based on certain considerations. Considerations that were used were based on the STAPLEE process, as this process addresses all the major factors when weighing the costs to the benefits of implementing one action over another. Important factors when ranking the alternatives include the prohibitive costs, the communities' resource capabilities, the communities' desire and concerns, and feasibility. The STAPLEE criteria were used to evaluate the potential benefits of the various mitigation actions. The STAPLEE evaluation includes consideration of the social, technical, administrative, political, legal, economic and environmental benefits of the mitigation actions. Below shows an explanation of the STAPLEE criteria taken from FEMA's Multi-Hazard Mitigation Planning Guidance (March 2004).

- S – Social:** Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the communities social and cultural values.
- T – Technical:** Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.
- A – Administrative:** Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
- P – Political:** Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support of the action.
- L – Legal:** It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
- E – Economical:** Budget constraints can significantly deter the implementation of mitigations actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.
- E – Environmental:** Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

The members attending were then asked to score the priority of each alternative. The key personnel and members attending the public meeting were asked to take into account all the STAPLEE criteria and to come up with a cumulative priority ranking that maximizes the benefits of each alternative.

The projects with the greatest benefits and lower relative costs as determined by the STAPLEE criteria were to have a "High" priority, while alternatives with low benefits and relatively high costs were determined to have a "Low" priority. Other alternatives were determined to have a "Medium" priority. A list showing the handout given at the second public meeting with Priority Score Tally is at the end of Appendix B. The numbers in each category of "high", "medium" and "low" are the number of votes given for that priority ranking. In the future, a more detailed and formal investigation of the costs and benefits of each mitigation alternative could be performed to better prioritize the actions in the City of Beatrice.

The scores from the Priority Score Talley were then averaged and the results were used to determine the final priority of each alternative. A final list of alternatives was then established and the associated hazard, description, responsible agency, priority, cost estimate, potential funding source and timeline was decided in a meeting with the City Administrator. These are shown in Appendix A for each action. It is important to note that not all of the mitigation actions identified may ultimately be included in the community's plan due to limited capabilities, prohibitive costs, low benefit/cost ratio, or other concerns. Even though there are cost estimates priority scores and responsible agencies identified, the City has not necessarily committed to undertaking any of the activities. They serve as a guide for the City to assist in hazard mitigation for the future.

Importance of NFIP

In 1968, when Congress passed the National Flood Insurance Act of 1968, U.S. Congress established the National Flood Insurance Program (NFIP). The NFIP enables property owners in participating communities to purchase flood insurance. Property owners can do this in exchange for State and community floodplain management regulations that reduce further flood damages.

The City of Beatrice is currently participating, and in good standing, with the NFIP. It is recommended and encouraged that the City remains in good standing with this program and continues to be involved as a participant with NFIP. Compliance with the NFIP should remain a top priority for Beatrice.

Section 6: Plan Implementation and Maintenance

Monitoring, Evaluation, and Updating the Plan

Future plan monitoring, evaluating, and updating will be the responsibility of the Beatrice City Council. Projects will be prioritized by the City Council with support and suggestions from the public and business owners. Unless otherwise specified by the City Council, the City Administrator will be responsible for implementation of the recommended projects. The City Administrator (or party responsible for the various implementation actions) will report on the status of all projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies could be revised.

To assist with the monitoring of the plan as each recommended project is completed, a detailed timeline of how that project was completed will be written and attached to the plan in a format selected by the City Council. Items to be included will be: timelines, agencies involved, area(s) benefited, total funding (if complete), etc.

At the discretion of the City Council, a local task force may be used to review the original draft of the mitigation plan and to recommend changes.

Review and updating to the plan will occur at least every five years. At the discretion of the City Council, updates may be incorporated more frequently, especially in the event of a major hazard. The City Council shall start meeting to discuss mitigation updates at least six months prior to the deadline for completing the plan review. The persons overseeing the evaluation process will review the goals and objectives of the previous plan and evaluate them to see that they are still pertinent and current. Among other questions, they may want to ask themselves:

- Do the goals and objectives address current and expected conditions?
- If any of the recommended projects have been completed, did they have the desired impact on the goal for which they were identified? If not, what was the reason it was not successful (lack of funds/resources, lack of political/popular support, underestimation of the amount of time needed, etc.)?
- Have the nature, magnitude, and/or type of risks changed?
- Are there implementation problems?
- Are current resources appropriate to implement the plan?
- Were the outcomes as expected?
- Did the plan partners participate as originally planned?
- Are there other agencies which should be included in the revision process?

Worksheets attached in Appendix D may also be used to assist in plan updates.

In addition, the City Council will be responsible for insuring that the Hazard Mitigation Plan goals and objectives are incorporated into applicable revisions of the City's comprehensive plan and any new planning projects undertaken by the City. The Hazard Mitigation Plan should also take into account any changes in the comprehensive plan, and incorporate the information accordingly in its next update.

Incorporation into Existing Planning Mechanisms

There is a lack of existing planning mechanisms for the Hazard Mitigation Plan to be incorporated into. At the discretion of the City Council, this plan could be incorporated into Beatrice's comprehensive plan. This would ensure that the mitigation component of the comprehensive plan would be consistently revisited and reviewed. However, care must be taken so that this mitigation portion is reviewed and updated every five years, as the evaluation and updating of the

comprehensive plan is currently done on a ten-year basis, with the next comprehensive plan update scheduled for 2015.

Continued Public Involvement

To insure continued Hazard Mitigation Plan support and suggestions from the public and business owners, public involvement should remain a top priority for the City of Beatrice. Public meetings involving discussion of mitigation updates should be published and posted in the following locations with a minimum of two weeks notice:

- Public spaces around City
- City hall
- City web site (beatrice.ne.gov)
- Beatrice Daily-Sun newspaper
- Regionally-distributed newspaper

Appendix A

Goal 1: Protect the Health and Safety of Residents

(Overall purpose of plan)

Goal 2: Reduce Future Losses from Hazard Events

Objective 2.1: Provide protection for existing structures, future development, critical facilities, services, utilities and trees to the extent possible.

Action 2.1.1: Bury Main Power Lines

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms

Description: Implement a plan for burying a percentage of overhead power lines each year to reduce the loss of power incurred from downed lines. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.

Cost: \$10,000,000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 10 years

Priority: Medium

Lead Agency: City, Beatrice Board of Public Works

Action 2.1.2: Bury Power Service Lines

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms

Description: Service lines shall be buried in conjunction with the relocation of the main power lines.

Cost: \$5,000,000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 10 years

Priority: Medium

Lead Agency: City, Beatrice Board of Public Works

Action 2.1.3: Provide Backup Power System

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms

Description: Develop a backup plan and construct a backup power system to provide redundant power supply to the City. This provides the City with the ability to provide the power to the community in the event of a hazard event destroys the primary system or it fails.

Cost: unknown

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 3 years

Priority: High

Lead Agency: City, Nebraska Public Power District, Beatrice Board of Public Works

Action 2.1.4: Review and upgrade, if necessary, infrastructure, security procedures and equipment at critical facilities in the community

***Hazards addressed:* Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding**

Description: Install flood protection barriers where appropriate. Renovate buildings for strength and safety, or take other measures to provide protection for critical facilities.

Cost: varies, as needed

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 5 years

Priority: High

Lead Agency: City, Beatrice Public Schools, Beatrice Police and Fire Departments, Beatrice Airport Authority, Individual home owners or business owners. Lead agency is dependant on what structure is being protected.

Action 2.1.5: Flood Control Projects In and Upstream of Beatrice

***Hazards addressed:* Flooding**

Description: Often events have caused the Big Blue River to go above flood stage, flooding much of Beatrice. This mitigation alternative is to do a full assessment of watershed draining to Beatrice and design flood control projects to reduce flooding. Potential candidates for flood control projects could be: detention cells to store storm water; levees in and around Beatrice; dams along the tributaries of the Big Blue River; dams along Indian Creek; and a flood control / recreational dam on the Big Blue River.

Dams built along the tributaries that empty into the Big Blue River and also along Indian Creek would help reduce flood damages in and around Beatrice. These small dams would help alleviate flooding to the city during a storm event. Furthermore, having a large flood control structure on the Big Blue River could dramatically reduce flooding in Beatrice. A large permanent pool area could also provide great recreational, social and economic benefits. Additional Levees, possibly along the entire stretch of the Big Blue River would help alleviate flooding in the City during a storm event. Building up existing levees could prove effective as well, but should be done in conjunction with modifying or replacing the existing bridges and/or approaches across open channels (See next mitigation alternative). It's recommended that any levee changes be made in accordance to the FEMA Levee Certification Standards.

Cost: Assessment and design about \$250,000, construction cost dependent on assessment findings.

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County, U.S. Army Corps of Engineers, LBBNRD, DNR, NDOR

Timeline: unknown

Priority: High

Lead Agency: Lower Big Blue Natural Resources District, Nebraska Department of Natural Resources, NDOR, City of Beatrice, Gage County

Action 2.1.6: Modify or replace existing bridges and/or approaches over Big Blue River at Hwy 136 and Hwy 77

Hazards addressed: Flooding

Description: This project proposes to replace or modify the bridges going across Big Blue River at Hwy 136 and/or Hwy 77. Based on observation of City Staff and residents, as well as a general understanding of known storm drainage deficiencies in and around the City of Beatrice, the Bridges at Hwy 136 and Hwy 77 experience flooding and may not provide adequate flow during a storm event. Furthermore, the approaches to these structures may not have adequate elevation to provide access across the river during a storm event. The approach at Hwy 136 especially experiences flooding. Conduct a preliminary drainage assessment of this area and design and construct bridge improvements to reduce and/or alleviate flooding.

Cost: unknown

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: unknown

Priority: High

Lead Agency: Lower Big Blue Natural Resources District,
Nebraska Department of Natural Resources, City of Beatrice,
Gage County

Action 2.1.7: Perform drainage assessment, design and construction project to reduce flooding at 718 S 9th St.

Hazards addressed: Flooding

Description: Based on allegations of the property owner, and understanding of the Meints Preliminary Drainage Study as well as the Beatrice Drainage Study, the property at 718 S 9th St appears to experience flooding, and the culvert may be deficient. Perform drainage assessment of this area and design and construct storm water improvements to reduce and/or alleviate flooding.

Cost: Assessment and design about \$10,000, construction cost dependent on assessment findings

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County, Home owner

Timeline: 1 year

Priority: Low

Lead Agency: City, Home owner

Action 2.1.8: Perform drainage assessment, design and construction project to reduce flooding at 1226 S 7th St.

Hazards addressed: Flooding

Description: Based on allegations of property owner, as well as a general understanding of known storm drainage deficiencies in and around the City of Beatrice, the property at 1226 S 7th St experiences flooding. Flooding may occur due to a broken storm sewer pipe or a deficient drainage system at this area, or combination of both. Conduct a preliminary drainage assessment of this area and design and construct storm water improvements to reduce and/or alleviate flooding.

Cost: Assessment and design about \$10,000, construction cost dependent on assessment findings

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County, Home owner

Timeline: 1 year

Priority: Low

Lead Agency: City, Home owner

Action 2.1.9: Preserve Natural Open Spaces

Hazards addressed: Flooding

Description: Minimize development of natural drainage ways to allow for drainage of storm water through the City. This can be accomplished through zoning regulations or property acquisition at the City's schedule

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: High

Lead Agency: Lower Big Blue Natural Resources District, Nebraska Department of Natural Resources, City

Action 2.1.10: Improve drainage patterns in and around the community

Hazards addressed: Flooding

Description: Improve drainage issues later identified by the City or identified in the Drainage Study and the Master Plan. Assessment, Design and Construct improvements as need be.

Cost: varies depending on size and type of project

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: On-going identification, Design and Construction: 2 years

Priority: Medium

Lead Agency: City

Action 2.1.11: Build additional Snow Fences

Hazards addressed: Severe Winter Storms

Description: Build additional snow fences to protect the main roads and critical facilities from excessive snow drifting and road closure.

Cost: \$25,000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 2 years

Priority: Medium

Lead Agency: City, Street Department

Action 2.1.12: Continue to improve the Maintenance of Roadway Snow Routes

Hazards addressed: Severe Winter Storms

Description: As needed, continue to revise and improved the snow and ice removal program for City streets. This plan should address situations such as plowing snow, removal of ice, parking during snow and ice removal, and removal of associated storm debris.

Cost: As-Needed

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: On-going

Priority: High

Lead Agency: City, Street Department

Objective 2.2: Develop hazard specific plans, conduct studies or assessments, and retrofit city to mitigate for hazards and minimize their impact.

Action 2.2.1: Capital Improvements Program (CIP)

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding

Description: Capital improvement programs serve as a guide to community funding for physical improvements over a given time period. How funding is allocated can affect what is at risk. For example, the CIP can have funds allocated to replace or strengthen vulnerable or critical facilities such as hospitals, government buildings, and utilities. This is a proactive approach to addressing improvements.

Cost: \$0

Potential Funding: None

Timeline: Initially: 1 year, then On-going

Priority: Medium

Lead Agency: City

Action 2.2.2: Backup of Digital Information

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding

Description: Provide facilities and equipment to provide a full digital backup on a daily basis of the City's stored digital information. Also back up digital information offsite.

Cost: \$3000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: Initial: 6 months to set up system, then On-going

Priority: Medium

Lead Agency: City

Action 2.2.3: Determine downstream reduction in floodplain

Hazards addressed: Flooding

Description: Conduct an evaluation of the reduction of the floodplain area as a result of future waterway improvement projects. Any changes to the floodplain will require a formal request be drafted to FEMA for changes to be made. This request will require substantial engineering calculations and evaluations of the change in river and creek flows along with future disaster damages to the City.

Cost: \$60,000

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County, DNR, NRD

Timeline: 2-3 years

Priority: Medium

Lead Agency: Nebraska Department of Natural Resources, City

Action 2.2.4: Utilize the citywide Drainage Study, and/or perform additional assessment, to create a Citywide Master Plan to prioritize all flooding related projects

Hazards addressed: Flooding

Description: As there are many known and possibly unknown drainage deficiencies in and around the city of Beatrice, prioritizing potential projects is essential to effective implementation of these projects. A Citywide Master Plan should be conducted to analyze the entire city, develop potential projects, and prioritize these projects. A Citywide Master Plan would compare benefits to costs and take into many factors to determine which projects should be completed before others.

Cost: \$100,000

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: Initial prioritization: 1 year, after this On-going

Priority: High

Lead Agency: City

Action 2.2.5: Improve or acquire property at high-risk to flooding

***Hazards addressed:* Flooding**

Description: Analyze each property that is subject to frequent flooding and identify feasible mitigation options. Offer incentives to encourage property owner to proceed with flood mitigation projects. City representatives should contact repetitive flooding property owners to identify the critical weaknesses in the property and discuss mitigation alternatives. Additionally, the property owner's willingness to pursue an improvement project should funding opportunities or incentives arise should be dialoged. Repetitive loss structures should be high priority.

Cost: Cost for improvements or acquisition will vary. On-going labor costs for City personnel. Funding for incentives may be available through the Lower Big Blue NRD or FEMA's Hazard Mitigation Grant or Flood Mitigation Assistance Programs.

Potential Funding: National Flood Insurance Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County, Lower Big Blue NRD, Nebraska Department of Natural Resources, FEMA

Timeline: Analysis: 2 years, Acquisition: Immediately following

Priority: Medium

Lead Agency: City, City Attorney

Action 2.2.6: Community Ratings System

***Hazards addressed:* Flooding**

Description: The City's participation in FEMA's Community Ratings System, a part of the National Flood Insurance Program, can provide an impetus for the community to undertake a number of projects and activities designed to increase the flooding mitigation efforts. In addition, CRS participation can help reduce flood insurance premiums.

According to the brochure ***CRS Communities and Their Classes***, published by the Federal Emergency Management Agency, the Community Rating System (CRS) "is a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood losses, to facilitate accurate insurance ratings, and to promote the awareness of flood insurance.

The CRS has been developed to provide incentives for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding." The incentives are in the form of insurance premium discounts that can equal up to a 45% discount of the cost of flood insurance. At the present time, the City of Beatrice is not a participant in the CRS program.

For communities to be eligible, they must be in full compliance with the National Flood Insurance Program and be in its Regular phase of the program. Communities in the Emergency phase of the program are not eligible.

Activities that receive CRS credit can take a number of forms such as higher regulatory standards for buildings located in floodplains as well as other regulatory activities, and are generally grouped into four categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: Medium

Lead Agency: City, Planning & Zoning Commission

Action 2.2.7: Provide backup Wastewater System

***Hazards addressed:* Tornados/High Winds, Severe Winter Storms, Flooding**

Description: Develop a backup plan and construct a wastewater system to provide protection in the event that the main wastewater treatment facility fails, or when the infiltration is greater than capacity.

Cost: \$25 million

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 3 years

Priority: Medium

Lead Agency: City, Beatrice Board of Public Works

Action 2.2.8: Design and Construction of Storm Water Treatment Facility

***Hazards addressed:* Severe Thunderstorms**

Description: Conduct an assessment, Design and Construct a Storm Water Treatment Facility. As State regulations change, the City of Beatrice may be required to treat all storm water.

Cost: \$25 million

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 5 years

Priority: High

Lead Agency: City, Beatrice Board of Public Works

Action 2.2.9: Develop a formal Snow plan

Hazards addressed: Severe Winter Storms

Description: Build and maintain a standardized plan of action for City personnel to follow in the event of a snow storm. This plan should include street clearing, checking utility service, checking for tree damage, and other potential risks to the City.

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: High

Lead Agency: City, Street Department

Objective 2.3: Minimize and control the impact of hazard events through enacting or updating ordinances, permits, laws or regulations.

Action 2.3.1: Improve and Maintain Subdivision Regulations

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding

Description: These regulations determine how a parcel of land can be divided into smaller parcels. It is wise to incorporate mitigation measures into subdivision regulations before a parcel of land is divided, as this allows for a wider variety of options.

Furthermore make changes to the subdivision ordinance that could assist in the mitigation of flooding include having no adverse impact.

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: Medium

Lead Agency: City, Planning Commission, Zoning Administrator

Action 2.3.2: Evaluate and Improve Building Standards

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding

natural disaster damage that is required of structures in the City. Implement additional standards as deemed necessary. Additional standards may be considered for the construction of more weather resistant structures.

Cost: \$0

Potential Funding: None

Timeline: 4 years

Priority: Medium

Lead Agency: City & Building Inspection Department

Action 2.3.3: Implement Disclosure Requirements

***Hazards addressed:* Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding, Drought**

Description: These requirements call for informing people of possible hazard exposure before they purchase a piece of property, enabling them to make a decision about a property with all of the information available including any risks associated with a particular hazard.

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: Medium

Lead Agency: Real Estate Agents, Nebraska Real Estate Commission

Action 2.3.4: Continue Floodplain Regulations

***Hazards addressed:* Flooding**

Description: Continue to administer local floodplain development regulations for new and existing structures. Strict enforcement of the type of development and elevations of structures should be conducted through the issuance of building permits by the City. Research should be conducted to determine if stricter regulations should be implemented by the City of Beatrice for building construction. Also continue to provide proper education for city officials to properly implement the regulations.

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: Medium

Lead Agency: City

Action 2.3.5: Maintain Tree City USA Status

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms

Description: Work with the National Arbor Day Foundation to continue the designation of the City of Beatrice as a 'Tree City USA'. Beatrice has been a Tree City USA for 20 years. This designation can be used to improve the image of and pride in the City and its tree program. Additionally, this designation can be beneficial in grant applications for tree projects. The four main requirements for achieving this designation are: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program with a \$2 per capita annual budget; 4) Enact an Arbor Day observance and proclamation. Maintain each of these.

Note: This mitigation alternative also applies for Severe Thunderstorms and Winter Storms

Cost: Required commitment of \$2 per capita per year (approximately \$8,000/year) for tree maintenance and plantings.

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County, National Arbor Day Foundation

Timeline: On-Going

Priority: Medium

Lead Agency: City, Public Properties Department, National Arbor Day Foundation

Action 2.3.6: Improve and Implement drought water conservation regulations

Hazards addressed: Drought

Description: Improve and/or develop a program to conserve water use by the citizens of Beatrice during elongated periods of drought. Potential restrictions on water could include limitations on lawn watering, car washing, or water sold to outside sources.

Cost: \$0

Potential Funding: None

Timeline: Initially: 1 year, then On-going

Priority: Medium

Lead Agency: City, Nebraska Department of Natural Resources

Goal 3: Increase Public Awareness and Educate on the Vulnerability to Hazards

Objective 3.1: Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects of them may be, where they occur, and what they can do to be better prepared.

Action 3.1.1: Increase Public Awareness of Vulnerability to Hazards

Hazards addressed: Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding, Drought, Extreme Heat

Description: Form a committee to gather and provide businesses and the public with information regarding hazards, management and preparedness.

Cost: \$4000

Potential Funding: None

Timeline: Immediate

Priority: Medium

Lead Agency: City, Gage County Emergency Management

Action 3.1.2: Education on Tree Types and Planting

Hazards addressed: Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms

Description: Maintain a listing of trees desirable for planting in the City of Beatrice. The list can serve as a guide to citizens planting new trees on private grounds. New tree plantings should have a low susceptibility to insect damage or disease and be of a hardy variety that will stand up well to heavy snow and ice loading as well as the force of high winds. Education programs should be developed to distribute information to citizens on how to reduce the risk from tree failure to life, property and utility systems.

Note: This mitigation alternative also applies for Severe Thunderstorms and Winter Storms

Cost: \$2,000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 1 year

Priority: Medium

Lead Agency: City, Parks & Recreation Commission, NE Forest Service

Action 3.1.3: Education (Tornado Safety Week)

Hazards addressed: Tornados/High Winds

Description: Review the current program as implemented during Severe Weather Awareness Week and modify or develop a week long program to educate the public on the hazards of tornados and potential safety precautions. The program shall also be distributed to the City schools.

Cost: \$1500

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 2 years

Priority: High

Lead Agency: City, Beatrice Public Schools, Gage County Emergency Management

Goal 4: Improve Emergency Management Capabilities

Objective 4.1: Develop or improve City and/or County Emergency Response Plan and procedures and abilities.

Action 4.1.1: Improve the Comprehensive City Disaster and Emergency Response Plan

***Hazards addressed:* Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding, Extreme Heat**

Description: Use the Hazard Mitigation Plan and its findings to revise and improve the Beatrice Comprehensive Disaster and Emergency Response Plan. Develop a schedule for updating the plan following updates to the Hazard Mitigation Plan.

Cost: \$10,000

Potential Funding: Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: On-going

Priority: Medium

Lead Agency: City, Gage County Emergency Management

Action 4.1.2: Additional Personnel for Emergency Response

***Hazards addressed:* Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding, Extreme Heat**

Description: Identify and train personnel and citizens for Emergency Response. Look at having not only a back up person for every position, but also a third backup for every position.

Cost: \$50,000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 5 Years

Priority: Medium

Lead Agency: City

Action 4.1.3: Additional Equipment for Emergency Response

***Hazards addressed:* Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding, Extreme Heat**

Description: Provide additional equipment as needed to respond to severe storms, winter storms, flooding and tornadoes and other natural hazards.

Cost: \$50,000 - \$400,000 per vehicle, varies depending on what equipment is needed

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: On-going

Priority: Medium

Lead Agency: City, Beatrice Police and Fire Departments

Action 4.1.4: Develop strategies to provide necessary services in the event of flooding

***Hazards addressed:* Flooding**

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: Medium

Lead Agency: City, Beatrice Board of Public Works, Nebraska Emergency Management Agency, Gage County Emergency Management

Action 4.1.5: All Terrain or 4-wheel drive vehicles for transportation

***Hazards addressed:* Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding**

Description: Provide a limited number of all terrain or 4-wheel drive vehicles to be used during disaster situations.

Cost: \$3,500 – 30,000 per vehicle

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: Immediate

Priority: Low

Lead Agency: City, Gage County, Gage County Emergency Management, Beatrice Fire Department, Beatrice Police Department

Action 4.1.6: Develop a list of volunteers with ATV's and snowmobiles

***Hazards addressed:* Severe Winter Storms**

Cost: \$0

Potential Funding: None

Timeline: 3 months

Priority: Low

Lead Agency: City, Beatrice Fire Department, Beatrice Police Department

Objective 4.2: Develop or improve Evacuation Plan and procedures.

Action 4.2.1: Evacuation Plan

***Hazards addressed:* Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding**

Description: Develop a list and map of potential evacuation routes utilizing the major street system of Beatrice and the network of state and federal highways that traverse the community. Along with these maps, Beatrice should develop a formal evacuation plan. This plan will need to provide adequate routes of exit from the City in the event that several exits routes are in traversable. Accommodations should be made to transport those who are unable to exit the City by their own means.

Cost: \$2,000

Potential Funding: None

Timeline: 2 years

Priority: High

Lead Agency: City

Action 4.2.2: Identify, Design, and Develop Storm Shelters

***Hazards addressed:* Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding**

Description: Many existing public buildings are available for use as shelters in the event of a disaster. The City should

develop plans to utilize these buildings in the event of a disaster. Additional buildings located in centralized population areas should be identified to increase the availability of shelter to the citizens of the City.

Furthermore, research and develop requirements for construction of storm shelters in new concentrated areas of mobile housing or other high-risk housing to provide shelter for residents. Also designate the hospital, library, jail, and other facilities, as storm shelters.

Furthermore, educate people who will utilize these shelters as to where the shelters are located and what service might be provided. Develop and distribute a brochure including this information to utility customers, landlords, home owners etc.

Cost: \$1,000/person

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 10 years

Priority: Medium

Lead Agency: City, Gage County Emergency Management, Red Cross

Objective 4.3: Improve warning systems and ability to communicate to residents and businesses during and following a disaster or emergency.

Action 4.3.1: Improve Communication to Residents and Businesses During and Following Emergencies

***Hazards addressed:* Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding, Drought, Extreme Heat**

Description: Create a formal contact point for emergency situations that is available around the clock for residents and businesses to contact. Examples are telephone hotlines, or public notice boards, cable system and specific radio frequency. This contact can provide information and assistance both during and following a disaster. Providing this contact can help increase public safety, speed recovery efforts and provide peace of mind to community.

Cost: \$1000, can vary depending on type of system implemented

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: Immediate

Priority: High

Lead Agency: City, Nebraska Emergency Management Agency, Gage County Emergency Management, Chamber of Commerce

Action 4.3.2: Improve Local Weather Radio Service

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding, Drought, Extreme Heat

Description: Improve local weather radio service to notify over the radio and weather radio channels of disasters and supply pertinent information.

Cost: \$5000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: On-going

Priority: Medium

Lead Agency: City, Fire Department

Action 4.3.3: Cable TV Interrupt Warning System

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding

Description: Improve and Implement a cable TV interrupt warning system that would notify cable TV viewers of disasters and supply pertinent information.

Cost: \$0

Potential Funding: None

Timeline: Immediate

Priority: Medium

Lead Agency: City, Police Department

Action 4.3.4: Telephone Interrupt Warning System / Reverse 911

Hazards addressed: Severe Thunderstorms, Tornadoes/High Winds, Severe Winter Storms, Flooding

Description: Implement a telephone interrupt warning system that would notify persons on the telephone of disasters and supply pertinent information.

Cost: \$15,000

Potential Funding: None

Timeline: Immediate

Priority: Medium

Lead Agency: City, Police Department

Action 4.3.5: Purchase and Issue Weather Radios for Schools and Critical Facilities

Hazards addressed: Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding

Description: Conduct inventory of schools and critical facilities to see if they have working weather radios. Purchase, issue and replace as needed.

Cost: \$5000

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: Immediate

Priority: Medium

Lead Agency: Fire Department

Action 4.3.6: Tornado Warning System for Future Development

Hazards addressed: Tornados/High Winds

Description: Work with Gage County to conduct an evaluation of implementing outdoor warning siren requirements for future subdivisions requiring the developers to install sirens if out of range of existing sirens. These sirens will have to be connected to the City's existing warning system. (Note that Beatrice already has 10 sirens and Gage County has an additional 13 sirens. Gage County operates and maintains all 23 sirens.) Furthermore, Beatrice should work with Gage County to further ensure there is sufficient siren coverage for the county as it develops.

Cost: \$15,000 - 25,000 per siren

Potential Funding: Pre-Disaster Mitigation Program, Nebraska Emergency Management Agency, City of Beatrice, Gage County

Timeline: 2 years

Priority: High

Lead Agency: City, Gage County, Gage County Emergency Management

Goal 5: Pursue Multi-Objective Opportunities Whenever Possible

Objective 5.1: When possible, use existing resources, agencies, and programs to implement the projects.

Action 5.1.1: Coordination with Surrounding Communities

Hazards addressed: Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding, Drought, Extreme Heat

Description: Build and maintain existing inter-local agreements with other communities to support each other in the event of a hazard event. This allows the City to share personnel and expertise with other municipalities to minimize the expense to each town for emergency personnel. This also assists the community in the participation of the National Incident Management System.

Cost: \$0

Potential Funding: None

Timeline: Initial: 2 years, then On-going

Priority: Medium

Lead Agency: City, Gage County

Action 5.1.2: Develop and maintain a list of potential funding sources for government agencies to utilize

***Hazards addressed:* Severe Thunderstorms, Tornados/High Winds, Severe Winter Storms, Flooding, Drought, Extreme Heat**

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: High

Lead Agency: City, Beatrice Board of Public Works, Nebraska Emergency Management Agency, FEMA, DNR, LBBNRD

Action 5.1.3: Continue to support Nebraska Dept. of Natural Resources water allocation regulations

***Hazards addressed:* Drought**

Description: Support NDNR regulations regarding water allocation in the area in and around the City of Beatrice. These regulations include well construction and location, closure of wells and the consumption of surface water for various uses. Where necessary, the City shall assist in the enforcement of regulations.

Cost: \$0

Potential Funding: None

Timeline: On-going

Priority: Medium

Lead Agency: City, Nebraska Department of Natural Resources

Objective 5.2: When possible implement projects that achieve several goals.
(The Action meeting this Objective could include any single or combination of previous mentioned Actions to achieve several goals at the same time.)

Appendix B

Documents Concerning Public Involvement and Meetings

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News

Beatrice receives FEMA grant money

Saturday, June 24, 2006 12:48 AM CDT

Beatrice has been selected for a pre-disaster mitigation planning project grant.

Beatrice will receive 75 percent, \$25,350, of the \$33,801 cost of the all-hazards planning project through the Federal Emergency Management Agency's Pre-Disaster Mitigation Program.

FEMA Director of Mitigation David Maurstad, former Beatrice mayor and Nebraska lieutenant governor, announced Friday that FEMA had selected Beatrice for a pre-disaster mitigation planning project.

"Mitigation saves our nation \$4 for every dollar spent," Maurstad said. "This program encourages local leaders across the nation to look ahead and plan against what could be catastrophic events. These mitigation activities in my hometown of Beatrice show that the state and local officials are working together with FEMA and other partners to make mitigation happen.

"Mitigation is the cornerstone of emergency preparedness and management. Funding these plans and projects reduces risks to lives and property. By making our communities safer in the first place, we make great strides toward reducing the need for federal post-disaster recovery funds."

Beatrice City Administrator Jim Bauer said the city had not received official word from FEMA on the grant. He said the Beatrice City Council approved submission of the grant application in February.

The plan will access vulnerabilities to natural and man-made disasters and suggest strategies for reducing or eliminating those vulnerabilities, Bauer said.

"All communities are required to do this now if they are to receive federal disaster funding in the future," he said.

Bauer said he wasn't sure when the plan would be finished. At some point, he said the council would have to officially approve an agreement with JEO Consulting of Wahoo for development of the plan.

The PDM Program, first authorized in the Disaster Mitigation Act of 2000 and first funded by President Bush in his fiscal 2003 budget, provides funding for mitigation plans and the implementation of cost-effective projects, such as buyouts of flood-prone buildings, construction of safe rooms, elevations of homes located in the floodplain or making structures more earthquake resistant, prior to disaster events.

The 58 activities chosen in the 2006 national grant competition will split \$47 million for plans and projects.

FEMA received 190 applications for the 2006 competition. A team of experts from federal, state, territorial, local and tribal governments evaluated all eligible applications and based their determinations on a wide range of criteria such as the technical feasibility of the proposed project, the project's cost-effectiveness, management and staffing of personnel to implement the project, hazard and risk factors, and benefits to the community. On March 1, 2003, FEMA became part of the U.S. Department of Homeland Security.



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September 29, 2006(3)

AGENDA
October 2, 2006

1 – Call to Order 7:00 PM

2 - Consent Agenda

- a. Approve agenda as submitted.
- b. Receive and place on file all notices pertaining to this meeting.
- c. Receive and place on file all materials having my bearing on this meeting.
- d. Approval of minutes of September 18, 29, 2006 as on file in the City Clerk's office.
- e. Approval of special designated permits (2) for Main Street Beatrice Governor's Pheasant Hunt on November 3 and 4, 2006.
- f. Approval of bid of Kuhl Trenching for \$33,693.75 for Sanitary Sewer District 456, Crest Add'n.
- g. Approval of bid of Robert L. Tiemann Construction for \$93,394.70 for Paving District 477, S 26th Street in Crest Addition,
- h. Approval of bid of Judds Brothers for \$74,675 for WPC Department Grit Removal System.
- i. Approval of plans, specifications and advertisement for bids for the Ridgeview Drive Paving Project Number 478.
- j. Approval of plans, specifications and advertisement for bids for the Security Fencing at the City Well Fields.
- k. Refer claim of Gary Johnson for sewer back-up at 501 Belvedere to City Attorney and City's insurance carrier.

3 – Public Hearings/Bids:

a Public Hearings:

- (1) Development of an All-Hazards Mitigation Plan. JEO Project Manager
- (2) Rezoning property in the SW ¼ of the SW ¼ of Section 4, T4N, R6E of the 6th PM, Gage County Nebraska from "AG" to "RR". Jameson Subdivision.

4 – Resolutions:

5 – Ordinances:

- a. Establishing salaries for city employees for FY07.
- b. Approving the plat of Jameson Subdivision.
- c. Rezoning Jameson Subdivision from "AG" to "RR".
- d. Amending Beatrice Code Section 9-100 regarding aboveground storage tanks.

6 – Public Forum:

7 – Discussions/Reports:

- a. Approval of bid for demolition of dilapidated structure at 307 S. 2nd Street.
- b. Approve negotiated Release of Claims with Bryan LGH for claim filed for Brady L. Murray.
- c. Denial of Claim of State Farm Insurance for damage to Stover camper from falling tree limb,

8 – Miscellaneous:

- a. Miscellaneous communications and reports

9 – Executive Session: Update on Litigation

"The biggest troublemaker you'll probably ever have to deal with, watches you from the mirror every morning.."

Beatrice Hazard Mitigation Plan
 Beatrice, NE
 October 2, 2006

Sign In Sheet

| Name | Agency | Address | Phone | Email Address |
|-------------------|-------------------------|------------------------------------|--------------|------------------------------|
| Kenee Bauer | Main Street | 206 N. 4th | 223-3244 | maurinstein@ncbas.org |
| Mary Schmitt | Main Street | 422 Court | 223-3122 | |
| DAVE ANDERSON | GAGE Co. | 42401 SW 61 RD OVELLE NE | 402-766-3790 | |
| DAVE CLABAYGH | LDG MRD | 805 Dorsey St Beatrice | 228-3402 | clabaygh@bbnrd.org |
| Sam Stevens | G.C.E.M.A | 600 Canal St Beatrice, Neb. | 228-1983 | |
| Brian Daake | Beatrice Fire/Rescue | 2721 Elk St Beatrice NE 68310 | 228-5246 | br1403@beatrice.com |
| John Carrel | Beatrice Fire | 706 N. 25th Beatrice NE 68310 | 228-5246 | |
| TIM OVERGAUW | City of Beatrice | 205 N. 4th St. | 228-5250 | |
| Bruce Lang | Beatrice Police | 201 N. 5th Beatrice NE | 223-4060 | blang@bwpw.ci.beatrice.ne.us |
| RON SUTNER | BPW | 415 N. 21st, Beatrice NE | 223-5726 | rsutner@bwpw.net |
| Rex Behrens | BFW | 205 N. 4th St, Beatrice, NE | 228-5208 | br@bwpw.ci.beatrice.ne.us |
| RICHARD CALHOON | BPW | 923 N. 17th St BEATRICE NE 68310 | 223-4991 | |
| Allen O. Grell | Gage Co | 1907 Washington St | 228-3665 | agrell@knb.org |
| Rosey Feit | BPW | Poplar 106 Fickner Ave | 678-3340 | |
| Dale Kruse | Beatrice Public Schools | 320 N 5th Beatrice | 223-1500 | |
| Rob Schetz | City Atty | 114 N 6th St Beatrice | 228-3443 | |
| LARRY WHITE | City Council | 2001 IRVING BEATRICE | 223-4373 | WHITE@BONMESSAGE.NET |
| David Pete Catlin | City Council | 2020 Jefferson St Beatrice NE | 228-4664 | |
| Dwight Barbe | City Council | 660 W. Court Beatrice | 228-2299 | |
| Richard Kope | City Council | 121 West Hills Beatrice | 228-7237 | Rkope@charter.com |
| Sam Johnson | Mayor | 1121 S 9th Beatrice | 223-5663 | PSCHLISTER@CHARTER.NE |
| JAMES PAWEL | CITY ADM | 400 BWA BEATRICE | 228-5211 | |
| Susan Wituski | City Council | 524 Belvedere Beatrice | 228-5860 | msw@tulski@alltel.net |

HAZARD IDENTIFICATION

| Hazard Type | | Likely to Experience? | Hazard Risk | Vulnerability |
|-----------------------------|-----------------------|-----------------------|---------------------|--------------------------------------|
| Rank Top 5 | | Yes / No | High / Medium / Low | Full, Severe, Limited, None, Unknown |
| <i>Natural Disasters</i> | | | | |
| 1 | Severe Thunderstorm | Yes | High | Severe |
| 2 | Tornado/High Winds | Yes | High | Severe |
| 3 | Severe Winter Storm | Yes | Medium | Severe |
| 4 | Flooding | Yes | Medium | Limited |
| 5 | Drought | Yes | High | Severe |
| 6 | Extreme Heat | Yes | High | Limited |
| | Wildfire | No | Low | Limited |
| | Landslide | No | Low | None |
| | Dam Failure | No | Low | None |
| | Earthquake | No | Low | None |
| <i>Human-made Disasters</i> | | | | |
| 7 | Railroad Derailment | Yes | Medium | Severe |
| 8 | Chemical Spill | Yes | Medium | None |
| 9 | Terrorism | No | Low | Limited |
| | School Shooting Spree | Yes - one vote | High | Severe |
| | Airport | - | - | - |
| | AgriTerrorism | - | - | - |

HAZARD OCCURRENCE RECORD

| | | | |
|--|---------------------------|----------------------------|-------------|
| Hazard: | Severe Thunderstorm | Date of Occurrence: | July 2001 |
| | | | |
| | | | |
| | | | |
| Hazard: | High Winds | Date of Occurrence: | Periodic |
| Wind blew roof off of apartment buildings near radio station | | | |
| Electical damages | | | |
| Trees falling on lines and transformers | | | |
| | | | |
| Hazard: | Tornado | Date of Occurrence: | may 1996 |
| Electical damages | | | |
| Trees falling on lines and transformers | | | |
| | | | |
| | | | |
| Hazard: | Heavy Precipitation Event | Date of Occurrence: | Periodic |
| Overflow of strom sewers at various locations | | | |
| | | | |
| | | | |
| Hazard: | Flooding on Big Blue | Date of Occurrence: | Periodic |
| River close to topping levee on south side of Big Blue | | | July - 2001 |
| Bridge access cut off on south and west sides of community. | | | |
| Flood water damage to home located at 718 S. 9th St. - Caused by storm | | | |
| | | | |

Preliminary Mitigation Alternatives from First Public Meeting

Channel Improvements running through the city of Beatrice

Debris Removal

Debris Removal - Big Blue River

Acquire high risk flood property

Clean out channel of Big Blue River - remove debris and silt

Stormwater retention

Culvert upgrade and ditch upgrade

Dam Blue River upstream to control and regulate water height

Elevate South 6th St. with Adequate Drainage

Better access to west side during flooding

Storm water improvements - 19th and Ella, 18th and Court, 8th and Court

Storm water runoff - area of 19th & Ella and 16th & Irving - requires better storm drainage

Continued acquisition of Flood Plain Properties

Consider Large Dam/Lake control of Big Blue - Lake would also enhance economic development of area

Remove Farms Union Fuel Storage Facility from between railroad tracks and Big Blue River

Channel stabilization from Big Blue River from West Court to Chataatga Park Area

Build a third bridge over Big Blue in Beatrice

Raising of Highway (77) south of Bridge

Elevate approaches to south 6th St bridge

Replace or upgrade both bridges (Hwy 136 and Hwy 77)

Raising approaches to the two existing bridges

Flood Plain Re-mapping

Flood Plain Re-mapping

Update Floodplain map

More floodplain purchases

Floodplain re-mapping

Floodplain remapping and regulations

Floodplain re-evaluation

Flood Plan - Completion of flooding building acquisition - removal of structures

Flood proofing of Hwy 77 & Hwy 136 - Bridges over Big Blue River

Flood proof bridge - in 19th street area

Flood proof water park area with channel widening and flood wall to protect city property

Emergency services to south and west side during flooding of bridge approaches

Tornado

Community shelter to be built

Tornado Shelters

Reduce Power Line/Communication Lines - clutter look and trees cause problems

More tornado shelters incorporated into buildings (new tourism building and fairgrounds)

Retrofit structures for wind resistance

Tornado shelters centrally located. (Have one in trailer park)

Update building codes

Airplane Crash - Location of Airport

Chemical Spills (Fertilizer Plant in Area)

Public Meeting

You are invited...

to attend a public meeting to discuss the completion of the Hazard Mitigation Plan for the City of Beatrice.

Your input is needed to prioritize potential solutions for reducing future losses in the community.



Monday, June 18
5:30 -7:00p.m.
Beatrice Public Schools
Administration Building,
320 N. 5th St.
Beatrice, Nebraska



Sponsored by

Consulting Group, Inc.

For more information,
contact
Lalit Jha
402 443-4661
JEO Consulting Group, Inc.

A project partly funded by the Nebraska Department of Natural Resources and the Nebraska Emergency Management Agency.

Photos courtesy of FEMA, the Omaha World Herald, and JEO Consulting Group.

BEATRICE HAZARD MITIGATION PLAN

Second Public Meeting City of Beatrice, Nebraska

- What:** Second public meeting to review, discuss and prioritize mitigation alternatives for the Beatrice Hazard Mitigation Plan
- When:** June 18th, 2007 • 5:30 – 7:00 pm
- Where:** Beatrice Public Schools Administration Building
320 N 5th St
Beatrice, NE
-

PRESS RELEASE:

The City of Beatrice, in coordination with the Department of Natural Resources is in the final stages of completing the “Beatrice Hazard Mitigation Plan”. A hazard mitigation plan is a community-guided document that identifies the City’s vulnerability to all natural disasters and what can be done to reduce or eliminate this vulnerability.

The plan is the outcome of a desire by local, state, and federal officials to reinforce the importance of planning for disasters before they occur, which culminated in the Disaster Mitigation Act of 2000 (DMA 2000). This act established that a pre-disaster hazard mitigation program would be required before funding post-disaster mitigation projects.

A public meeting will be held on June 18, 2007, at the Beatrice Public Schools Administration Building from 5:30 to 7:00 p.m. to receive public input regarding the plan and comments on additional mitigation alternatives that will reduce the vulnerability to the natural disasters in Beatrice. Upon its completion, the revised hazard mitigation plan will need to be formally adopted by the Beatrice City Council. This plan also must be submitted to NEMA and FEMA for review and approval.

JEO Consulting Group Inc, a Wahoo Planning and Engineering firm, is providing professional services to complete the hazard mitigation plan. For more information, please contact Lalit Jha, of JEO Consulting Group at 443-4661.

As key officials and members of the community of Beatrice and surrounding area, you are highly encouraged to participate in this final public meeting and provide guidance to prioritize the mitigation alternatives in the Beatrice Hazard Mitigation Plan.

For more information contact: Lalit Jha • JEO Consulting Group, Inc • 402.443.4661 • ljha@jeo.com

FOR IMMEDIATE RELEASE

CITY OF BEATRICE TO FINALIZE “HAZARD MITIGATION PLAN”

Beatrice, Nebraska: The City of Beatrice, in coordination with the Department of Natural Resources is in the final stages of completing the “Beatrice Hazard Mitigation Plan”. A hazard mitigation plan is a community-guided document that identifies the City’s vulnerability to all natural disasters and what can be done to reduce or eliminate this vulnerability.

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alls City an injured accident

alls City man was taken to LGH West after suffering s in a single-vehicle acci- near Barneston early lay morning. /en Thompson, 52, was to Bryan LGH West in 1 to be treated for injuries tained in the accident on ka Highway 8 and South

City to finalize Hazard Mitigation Plan

Public meeting scheduled for June 18

The City of Beatrice, in coordination with the Nebraska Department of Natural Resources, is in the final stages of completing the "Beatrice Hazard Mitigation Plan."

A hazard mitigation plan is a community-guided document

that identifies the city's vulnerability to all natural disasters and what can be done to reduce or eliminate this vulnerability.

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For more information, contact Lalit Jha, of JEO Consulting Group, at (402) 443-4661.

Money

Market wa

June 7, 2007

Dow Jones industrials -19 13,2

Nasdaq composite -45 2,54

Standard & Poor's 500 -26 1,49

Russell 2000 -15 82

NYSE diary

Preliminary Goals and Objectives

Goal 1: Protect the Health and Safety of Residents

(Overall purpose of the plan)

Goal 2: Reduce Future Losses from Hazard Events

- Objective 2.1: Provide protection for existing structures to the extent possible
- Objective 2.2: Identify and reduce repetitive losses in problem areas
- Objective 2.3: Provide protection for future development to the extent possible
- Objective 2.4: Provide protection for critical public facilities and services

Goal 3: Increase Public Awareness and Educate on the Vulnerability to Hazards

- Objective 3.1: Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects of them may be, where they occur, and what they can do to be better prepared

Goal 4: Improve Emergency Management Capabilities

- Objective 4.1: Develop or improve City and/or County Emergency Response Plan
- Objective 4.2: Develop or improve warning and Evacuation Plan and procedures
- Objective 4.3: Improve ability to communicate to residents and businesses during and following a disaster or emergency

Goal 5: Pursue Multi-Objective Opportunities Whenever Possible

- Objective 5.1: When possible, use existing resources, agencies, and programs to implement the projects
- Objective 5.2: When possible implement projects that achieve several goals

Prioritizing Mitigation Alternatives using STAPLEE

Mitigation alternatives or actions need to be prioritized based on certain considerations. FEMA recommends using the STAPLEE evaluation, as this process addresses all the major factors when weighing the costs to the benefits of implementing one action over another. The STAPLEE evaluation includes consideration of the social, technical, administrative, political, legal, economic and environmental benefits of the mitigation actions. Below shows an explanation of the STAPLEE criteria taken from FEMA's Multi-Hazard Mitigation Planning Guidance (March 2004).

- S – Social:** Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the communities social and cultural values.
- T – Technical:** Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.
- A – Administrative:** Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
- P – Political:** Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support of the action.
- L – Legal:** It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
- E – Economical:** Budget constraints can significantly deter the implementation of mitigations actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.
- E – Environmental:** Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

Priority Score Tally

(The numbers indicate how many votes there were for the high, medium and low priority.)

GENERAL MITIGATION ALTERNATIVES

- 1) **Increase Public Awareness of Vulnerability to Hazards / Education**
Description: Form a committee to gather and provide businesses and the public with information regarding hazards, management and preparedness.
____3____ High ____10____ Medium ____2____ Low

- 2) **Improve the Comprehensive City Disaster and Emergency Response Plan**
Description: Use the Hazard Mitigation Plan and its findings to revise and improve the Beatrice Comprehensive Disaster and Emergency Response Plan. Develop a schedule for updating the plan following updates to the Hazard Mitigation Plan.
____6____ High ____7____ Medium ____2____ Low

- 3) **Evacuation Plan**
Description: Develop a list and map of potential evacuation routes utilizing the major street system of Beatrice and the network of state and federal highways that traverse the community. Along with these maps, Beatrice should develop a formal evacuation plan. This plan will need to provide adequate routes of exit from the City in the event that several exits routes are in traversable. Accommodations should be made to transport those who are unable to exit the City by their own means.
____10____ High ____3____ Medium ____2____ Low

- 4) **Improve Communication to Residents and Businesses During and Following Emergencies**
Description: Create a formal contact point for emergency situations that is available around the clock for residents and businesses to contact. Examples are telephone hotlines, or public notice boards, cable system and specific radio frequency. This contact can provide information and assistance both during and following a disaster. Providing this contact can help increase public safety, speed recovery efforts and provide peace of mind to community.
____8____ High ____5____ Medium ____2____ Low

- 5) **Improve Local Weather Radio Service**
Description: Improve local weather radio service to notify over the radio and weather radio channels of disasters and supply pertinent information.
____3____ High ____10____ Medium ____2____ Low

- 6) **Cable TV Interrupt Warning System**
Description: Implement a cable TV interrupt warning system that would notify cable TV viewers of disasters and supply pertinent information.
____4____ High ____7____ Medium ____4____ Low

- 7) **Telephone Interrupt Warning System / Reverse 911**
Description: Implement a telephone interrupt warning system that would notify persons on the telephone of disasters and supply pertinent information.
____4____ High ____8____ Medium ____3____ Low

- 8) **Purchase and Issue Weather Radios for Schools and Critical Facilities**
Description: Conduct inventory of schools and critical facilities to see if they have working weather radios. Purchase, issue and replace as needed.
____5____ High ____6____ Medium ____4____ Low

9) Additional Personnel for Emergency Response

Description: Identify and train personnel and citizens for Emergency Response. Look at having not only a back up person for every position, but also a third backup for every position.

___3___ High ___9___ Medium ___3___ Low

10) Improve and maintain Subdivision Regulations

Description: These regulations determine how a parcel of land can be divided into smaller parcels. It is wise to incorporate mitigation measures into subdivision regulations before a parcel of land is divided, as this allows for a wider variety of options.

___2___ High ___8___ Medium ___5___ Low

11) Evaluate and Improve Building Standards

Description: Evaluate the existing construction standards and building codes to determine the degree of protection from natural disaster damage that is required of structures in the City. Additional standards shall be considered for the construction of more weather resistant structures.

___3___ High ___7___ Medium ___5___ Low

12) Capital Improvements Program (CIP):

Description: Capital improvement programs serve as a guide to community funding for physical improvements over a given time period. How funding is allocated can affect what is at risk. For example, the CIP can have funds allocated to replace or strengthen vulnerable or critical facilities such as hospitals, government buildings, and utilities. This is a proactive approach to addressing improvements.

___6___ High ___9___ Medium ___0___ Low

13) Implement Disclosure Requirements

Description: These requirements call for informing people of possible hazard exposure before they purchase a piece of property, enabling them to make a decision about a property with all of the information available including any risks associated with a particular hazard.

___4___ High ___10___ Medium ___1___ Low

14) Bury main power lines

Description: Implement a plan for burying a percentage of overhead power lines each year to reduce the loss of power incurred from downed lines. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.

___5___ High ___7___ Medium ___3___ Low

15) Bury power service lines

Description: Service lines shall be buried in conjunction with the relocation of the main power lines.

___4___ High ___9___ Medium ___2___ Low

16) Identify, Design, and Develop storm shelters

Description: Many existing buildings are available for use as shelters in the event of a disaster. The City should develop plans to utilize these buildings in the event of a disaster. Additional buildings located in centralized population areas should be identified to increase the availability of shelter to the citizens of the City.

Furthermore, research and develop requirements for construction of storm shelters in new concentrated areas of mobile housing or other high-risk housing to provide shelter for residents. Also designate the hospital, library, jail, and other facilities, as storm shelters.

Furthermore, educate people who will utilize these shelters as to where the shelters are located and what service might be provided. Develop and distribute a brochure including this information to utility customers, landlords, home owners etc.

___5___ High ___5___ Medium ___5___ Low

17) Coordination with Surrounding Communities

Description: Build and maintain existing inter-local agreements with other communities to support each other in the event of a hazard event. This allows the City to share personnel and expertise with other municipalities to minimize the expense to each town for emergency personnel. This also assists the community in the participation of the National Incident Management System

___5___ High ___6___ Medium ___3___ Low

18) Provide backup Power System

Description: Develop a backup plan and construct a backup power system to provide redundant power supply to the City. This provides the City with the ability to provide the power to the community in the event of a hazard event destroys the primary system or it fails.

___6___ High ___4___ Medium ___4___ Low

19) Backup of Digital Information

Description: Provide facilities and equipment to provide a full digital backup on a daily basis of the City's stored digital information.

___3___ High ___8___ Medium ___3___ Low

20) Additional equipment for Emergency Response

Description: Provide additional equipment as needed to respond to severe storms, winter storms, flooding and tornados and other natural hazards.

___5___ High ___4___ Medium ___5___ Low

21) Review and upgrade, if necessary, infrastructure, security procedures and equipment at critical facilities in the community.

Description: Install flood protection barriers where appropriate. Renovate buildings for strength and safety, or take other measures to provide protection for critical facilities.

___9___ High ___4___ Medium ___1___ Low

22) Develop and maintain a list of potential funding sources for government agencies to utilize.

___9___ High ___3___ Medium ___2___ Low

23) Develop and maintain a list of resources for individuals to utilize during economic hardships.

___3___ High ___7___ Medium ___4___ Low

HAZARD SPECIFIC MITIGATION ALTERNATIVES

A) Flooding

24) Flood Control Projects In and Upstream of Beatrice

Description: Often events have caused the Big Blue River to go above flood stage, flooding much of Beatrice. This mitigation alternative is to do a full assessment of watershed draining to Beatrice and design flood control projects to reduce flooding. Potential candidates for flood control projects could be: detention cells to store storm water; levees in and around Beatrice; dams along the tributaries of the Big Blue River; dams along Indian Creek; and a flood control / recreational dam on the Big Blue River.

Dams built along the tributaries that empty into the Big Blue River and also along Indian Creek would help reduce flood damages in and around Beatrice. These small dams would help alleviate flooding to the city during a storm event. Furthermore, having a large flood control structure on the Big Blue River could dramatically reduce flooding in Beatrice. A large permanent pool area could also provide great recreational, social and economic benefits. Additional Levees, possibly along the entire stretch of the Big Blue River would help alleviate flooding in the City during a storm event. Building up existing levees could prove effective as well, but should be done in conjunction with modifying or replacing the existing bridges across open channels (See next mitigation alternative). It's recommended that any levee changes be made in accordance to the FEMA Levee Certification Standards.

___9___ High ___5___ Medium ___1___ Low

25) Modify or replace existing bridges over Big Blue River at Hwy 136 and Hwy 77.

Description: This project proposes to replace or modify the bridges going across Big Blue River at Hwy 136 and/or Hwy 77. Based on observation of City Staff and residents, as well as a general understanding of known storm drainage deficiencies in and around the City of Beatrice, the Bridges at Hwy 136 and Hwy 77 experience flooding and may not provide adequate flow during a storm event. Furthermore, the approaches to these structures may not have adequate elevation to provide access across the river during a storm event. The approach at Hwy 136 especially experiences flooding. Conduct a preliminary drainage assessment of this area and design and construct bridge improvements to reduce and/or alleviate flooding.

___10___ High ___1___ Medium ___4___ Low

26) Determine downstream reduction in floodplain

Description: Conduct an evaluation of the reduction of the floodplain area as a result of future waterway improvement projects. Any changes to the floodplain will require a formal request be drafted to FEMA for changes to be made. This request will require substantial engineering calculations and evaluations of the change in river and creek flows along with future disaster damages to the City.

___6___ High ___8___ Medium ___1___ Low

27) Perform drainage assessment, design and construction project to reduce flooding at 718 S 9th St.

Description: Based on observation of City Staff and residents, and understanding of the Meints Preliminary Drainage Study as well as the Beatrice Drainage Study, the property at 718 S 9th St appears to experience flooding, and the culvert may be deficient. Perform

drainage assessment of this area and design and construct storm water improvements to reduce and/or alleviate flooding.

___2___ High ___5___ Medium ___8___ Low

28) Perform drainage assessment, design and construction project to reduce flooding at 1226 S 7th St.

Description: Based on observation of City Staff and residents, as well as a general understanding of known storm drainage deficiencies in and around the City of Beatrice, the property at 1226 S 7th St experiences flooding. Flooding may occur due to a broken storm sewer pipe or a deficient drainage system at this area, or combination of both. Conduct a preliminary drainage assessment of this area and design and construct storm water improvements to reduce and/or alleviate flooding.

___3___ High ___5___ Medium ___7___ Low

29) Complete a Citywide Master Plan to prioritize all flooding related projects

Description: As there are many known and possibly unknown drainage deficiencies in and around the city of Beatrice, prioritizing potential projects is essential to effective implementation of these projects. A Citywide Master Plan should be conducted to analyze the entire city, develop potential projects, and prioritize these projects. A Citywide Master Plan would compare benefits to costs and take into many factors to determine which projects should be completed before others.

___8___ High ___5___ Medium ___2___ Low

30) Improve or acquire high-risk to flooding property

Description: Analyze each property that is subject to frequent flooding and identify feasible mitigation options. Offer incentives to encourage property owner to proceed with flood mitigation projects. City representatives should contact repetitive flooding property owners to identify the critical weaknesses in the property and discuss mitigation alternatives. Additionally, the property owner's willingness to pursue an improvement project should funding opportunities or incentives arise should be dialoged. Repetitive loss structures should be high priority.

___3___ High ___9___ Medium ___3___ Low

31) Continue floodplain regulations

Description: Continue to administer local floodplain development regulations for new and existing structures. Strict enforcement of the type of development and elevations of structures should be conducted through the issuance of building permits by the City. Research should be conducted to determine if stricter regulations should be implemented by the City of Beatrice for building construction. Also continue to provide proper education for city officials to properly implement the regulations.

___5___ High ___9___ Medium ___1___ Low

32) Preserve Natural Open Spaces

Description: Minimize development of natural drainage ways to allow for drainage of storm water through the City. This can be accomplished through zoning regulations or property acquisition at the City's schedule

___8___ High ___7___ Medium ___0___ Low

33) Develop strategies to provide necessary services in the event of flooding

___4___ High ___10___ Medium ___1___ Low

34) Improve drainage patterns in and around the community

Description: Improve drainage issues later identified by the City or identified in the Master Plan. Assessment, Design and Construct improvements as need be.

___4___ High ___10___ Medium ___1___ Low

35) Community Ratings System

Description: The City's participation in FEMA's Community Ratings System, a part of the National Flood Insurance Program, can provide an impetus for the community to undertake a number of projects and activities designed to increase the flooding mitigation efforts. In addition, CRS participation can help reduce flood insurance premiums.

According to the brochure **CRS Communities and Their Classes**, published by the Federal Emergency Management Agency, the Community Rating System (CRS) "is a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood losses, to facilitate accurate insurance ratings, and to promote the awareness of flood insurance.

The CRS has been developed to provide incentives for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding." The incentives are in the form of insurance premium discounts that can equal up to a 45% discount of the cost of flood insurance. At the present time, the City of Beatrice is not a participant in the CRS program.

___6___ High ___7___ Medium ___2___ Low

36) Provide backup Wastewater System

Description: Develop a backup plan and construct a wastewater system to provide protection in the event that the main wastewater treatment facility fails, or when the infiltration is greater than capacity.

___4___ High ___8___ Medium ___3___ Low

B) Tornadoes

37) Education on tree types and planting

Description: Maintain a listing of trees desirable for planting in the City of Beatrice. The list can serve as a guide to citizens planting new trees on private grounds. New tree plantings should have a low susceptibility to insect damage or disease and be of a hardy variety that will stand up well to heavy snow and ice loading as well as the force of high winds. Education programs should be developed to distribute information to citizens on how to reduce the risk from tree failure to life, property and utility systems.

___1___ High ___9___ Medium ___5___ Low

38) Maintain Tree City USA Status

Description: Work with the National Arbor Day Foundation to continue the designation of the City of Beatrice as a 'Tree City USA'. Beatrice has been a Tree City USA for 20 years. This designation can be used to improve the image of and pride in the City and its tree program. Additionally, this designation can be beneficial in grant applications for tree projects. The four main requirements for achieving this designation are: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program with a \$2 per capita annual budget; 4) Enact an Arbor Day observance and proclamation. Maintain each of these.

___5___ High ___7___ Medium ___3___ Low

39) Tornado Warning System for Future Development

Description: Work with Gage County to conduct an evaluation of implementing outdoor warning siren requirements for future subdivisions requiring the developers to install sirens if out of range of existing sirens. These sirens will have to be connected to the City's existing warning system. (Note that Beatrice already has 8 sirens and operates sirens across Gage County.) Furthermore, Beatrice should work with Gage County to further ensure there is sufficient siren coverage for the county as it develops.

___10___ High ___4___ Medium ___1___ Low

40) Education (Tornado Safety Week)

Description: Develop a week long program to educate the public on the hazards of tornados and potential safety precautions. The program shall also be distributed to the City schools for potential incorporation into the curriculum.

___7___ High ___4___ Medium ___4___ Low

C) Severe Winter Storms

41) ATV's for transportation

Description: Provide a limited number of all terrain vehicles to be used during disaster situations.

___3___ High ___5___ Medium ___7___ Low

42) Build additional Snow Fences

Description: Build additional snow fences to protect the main roads and critical facilities from excessive snow drifting and road closure.

___2___ High ___7___ Medium ___6___ Low

43) Continue to improve the Maintenance of Roadway Snow Routes

Description: As needed, continue to revise and improved the snow and ice removal program for City streets. This plan should address situations such as plowing snow, removal of ice, parking during snow and ice removal, and removal of associated storm debris.

___8___ High ___6___ Medium ___1___ Low

44) Develop a formal Snow plan

Description: Build and maintain a standardized plan of action for City personnel to follow in the event of a snow storm. This plan should include street clearing, checking utility service, checking for tree damage, and other potential risks to the City.

___8___ High ___5___ Medium ___2___ Low

45) Develop a list of volunteers with ATV's and snowmobiles

___1___ High ___6___ Medium ___7___ Low

D) Drought

46) Implement drought water conservation regulations

Description: Research and develop a program to conserve water use by the citizens of Beatrice during elongated periods of drought. Potential restrictions on water could include limitations on lawn watering, car washing, or water sold to outside sources.

___3___ High ___8___ Medium ___4___ Low

47) Support Nebraska Dept. of Natural Resources water allocation regulations

Description: Support NDNR regulations regarding water allocation in the area in and around the City of Beatrice. These regulations include well construction and location and

For more information, contact
Dan Lambé, Vice President at
dlambe@arborday.org or Woodrow
Nelson, Director of Marketing at
wnelson@arborday.org or call
888-448-7337



News from

**The National
Arbor Day Foundation®**

211 N. 12th St. • Lincoln, NE 68508 • 402-474-5655 arborday.org

We inspire people to plant, nurture, and celebrate trees.

FOR IMMEDIATE RELEASE:

Beatrice Named Tree City USA

Beatrice has been named a Tree City USA community by The National Arbor Day Foundation to honor its commitment to community forestry. It is the twentieth year Beatrice has received this national recognition.

The Tree City USA program is sponsored by The National Arbor Day Foundation in cooperation with the National Association of State Foresters and the USDA Forest Service.

Beatrice has met the four standards to become a Tree City USA community: a tree board or department, a tree care ordinance, a comprehensive community forestry program, and an Arbor Day observance.

"Trees in our cities and towns help clean the air, conserve soil and water, moderate temperature and bring nature into our daily lives," said John Rosenow, president of The National Arbor Day Foundation. "Tree City USA designation recognizes the work of elected officials, staff and citizens who plant and care for the community forest."

Trees are a vital component of the infrastructure in our cities and towns, and provide environmental and economical benefits," Arbor Day Foundation President Rosenow added. "A community, and its citizens, that recognize these benefits and provide needed care for its trees deserves recognition and thanks."

#



The National Arbor Day Foundation®

211 N. 12th St. • Lincoln, NE 68508 • 402-474-5655 arborday.org

We inspire people to plant, nurture, and celebrate trees.

April 2, 2007

The Honorable Dennis Schuster
Mayor of the City of Beatrice
1121 South 9th •
Beatrice, NE 68310

Dear Mayor Schuster,

Congratulations to Beatrice on being named as a 2006 Tree City USA!

Trees in our cities and towns help clean the air, conserve soil and water, moderate temperature, and bring nature into our daily lives. Trees are a vital component of the infrastructure in our cities and towns, and provide environmental and economical benefits. A community, and its citizens, that recognize these benefits and provide needed care for its trees deserves recognition and thanks.

Tree City USA recognizes communities that have proven their commitment to an effective, ongoing community forestry program. Such a program is one marked by renewal and improvement.

Tree City USA is sponsored in cooperation with the National Association of State Foresters and the USDA Forest Service. State foresters are responsible for the presentation of the Tree City USA flag and other materials. We will forward your awards to Chip Murrow in your state forester's office. They will be coordinating the presentation with you. It would be especially appropriate to make the Tree City USA award a part of your Arbor Day ceremony.

Again, congratulations on receiving this national recognition for your tree-cape program.

Best regards,



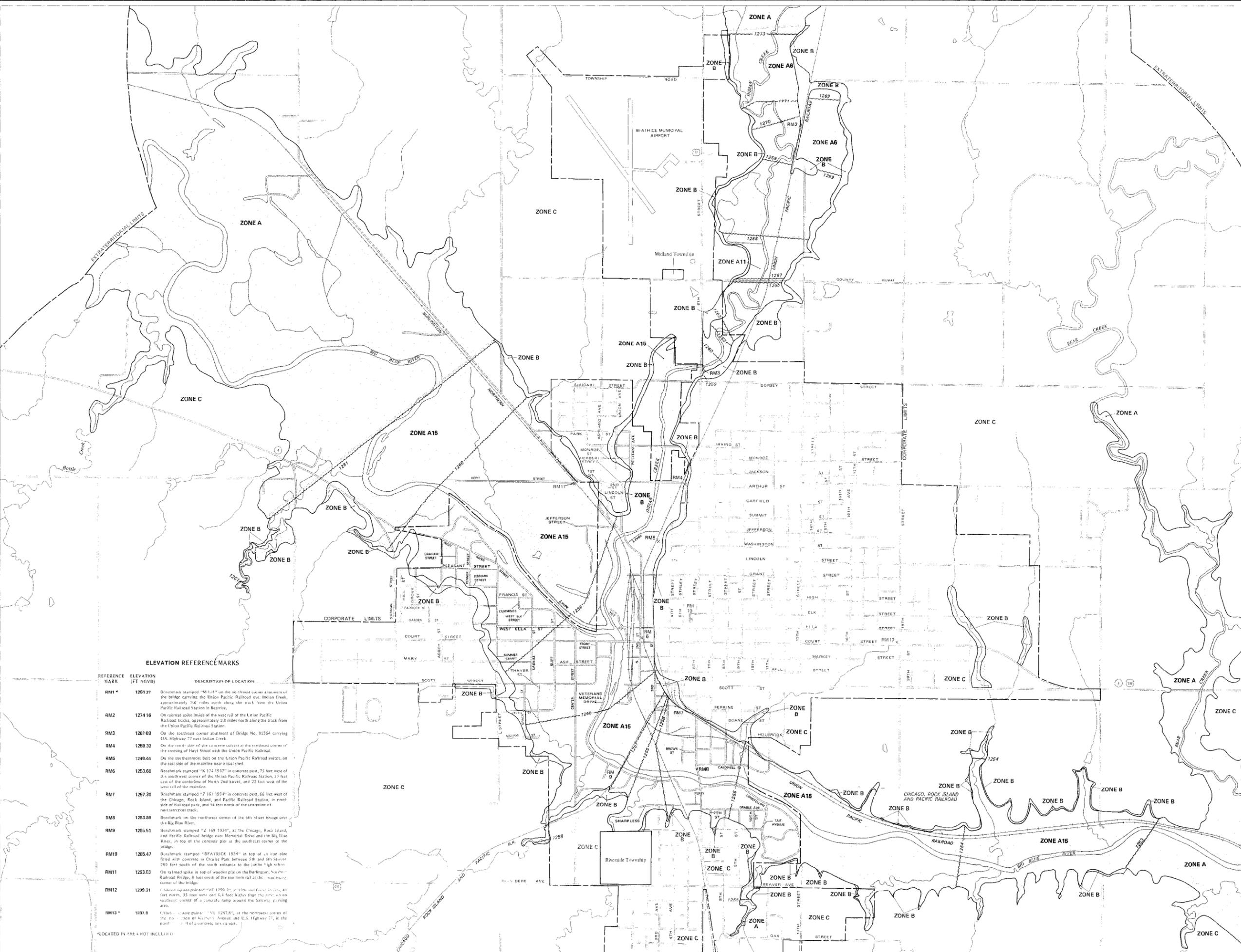
John Rosenow

President

cc: Mark Pethoud

Appendix C

FEMA FIRM for Beatrice – January 3, 1985



KEY TO MAP

| | |
|--------------------------------|--------------------|
| 500-Year Flood Boundary | ZONE B |
| 100-Year Flood Boundary | ZONE A1 |
| Zone Designations* | ZONE A2 ZONE A3 |
| 100-Year Flood Boundary | ZONE B |
| 500-Year Flood Boundary | ZONE B |
| Base Elevation in Feet** | 873 |
| Base Flood Elevation in Feet** | (E1 997) |
| Elevation Reference Mark | RM7 |
| Zone D Boundaries | M1.5 |
| River Mile | M1.5 |

**Referenced to the National Geodetic Vertical Datum of 1929

***EXPLANATION OF ZONE DESIGNATIONS**

| ZONE | EXPLANATION |
|------|---|
| A | Areas of 100-year flood base flood elevations and flood hazard factors not determined. |
| A1 | Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined. |
| A10 | Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined. |
| A11 | Areas of 100-year flood; base flood elevations and flood hazard factors not determined. |
| A15 | Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined. |
| A16 | Areas between limits of the 100-year flood and 500-year flood or on the basis subject to 100-year flooding with average depths less than one (1) foot, where the contributing drainage area is less than one square mile or areas protected by levees from the base flood (medium shading). |
| A30 | Areas of minimal flooding. (No shading) |
| A99 | Areas of undetermined, but possible, flood hazards. |
| B | Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined. |
| C | Areas of minimal flooding. (No shading) |
| D | Areas of undetermined, but possible, flood hazards. |
| V | Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined. |
| V1 | Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined. |
| V30 | Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined. |

NOTES TO USER

Certain areas not in the special flood hazard areas (Zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all potential features outside special flood hazard areas.

For additional map panels, see separately printed Map Index.

INITIAL IDENTIFICATION
AUGUST 6 1976

FLOOD HAZARD BOUNDARY MAP REVISIONS*

FLOOD INSURANCE RATE MAP EFFECTIVE
SEPTEMBER 10 1977

FLOOD INSURANCE RATE MAP REVISIONS:

See revised January 3 1985 for changes in flood hazard areas and flood insurance rates.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6629.



ELEVATION REFERENCE MARKS

| REFERENCE MARK | ELEVATION (FT NGVD) | DESCRIPTION OF LOCATION |
|----------------|---------------------|---|
| RM1* | 1281.37 | Benchmark stamped "M 111" on the northeast corner abutment of the bridge carrying the Union Pacific Railroad over Indian Creek, approximately 1.6 miles north along the track from the Union Pacific Railroad Station in Beatrice. |
| RM2 | 1274.16 | On railroad spike inside of the west fill of the Union Pacific Railroad tracks, approximately 2.8 miles north along the track from the Union Pacific Railroad Station. |
| RM3 | 1261.69 | On the southeast corner abutment of Bridge No. 02364 carrying U.S. Highway 77 over Indian Creek. |
| RM4 | 1269.32 | On the north side of the concrete culvert at the northeast corner of the crossing of Hart Street with the Union Pacific Railroad. |
| RM5 | 1249.44 | On the southernmost bolt on the Union Pacific Railroad switch, on the east side of the mainline near a trestle. |
| RM6 | 1253.60 | Benchmark stamped "K 174 1937" in concrete post, 75 feet west of the southwest corner of the Union Pacific Railroad Station, 37 feet east of the centerline of North 2nd Street, and 22 feet west of the west wall of the mainline. |
| RM7 | 1257.20 | Benchmark stamped "7 167 1937" in concrete post, 66 feet west of the Chicago, Rock Island, and Pacific Railroad Station, on east side of Railroad park, and 74 feet north of the centerline of mainline track. |
| RM8 | 1253.85 | Benchmark on the northwest corner of the 6th Street bridge over the Big Blue River. |
| RM9 | 1255.51 | Benchmark stamped "Z 169 1934" at the Chicago, Rock Island, and Pacific Railroad bridge over Memorial Drive and the Big Blue River, in top of the concrete pier at the southeast corner of the bridge. |
| RM10 | 1285.47 | Benchmark stamped "EFA/BRICE 1934" in top of an iron pile filled with concrete in Charles Park between 5th and 6th Streets 700 feet south of the south entrance to the Junior High School. |
| RM11 | 1253.03 | On a lead spike in top of wooden pile on the Burlington, Union Pacific Railroad Bridge, 8 feet south of the southwest rail at the southeast corner of the bridge. |
| RM12 | 1299.31 | Concrete square pile "VF 1999 31" on 13th and Four Streets, 41 feet north, 35 feet west and 2.4 feet higher than the pier on the southwest corner of a concrete ramp around the Salvey parking area. |
| RM13* | 1287.8 | Concrete square pile "V1 1287.8" at the northwest corner of the intersection of ALMOND Avenue and U.S. Highway 77, in the north side of the concrete box culvert. |

*LOCATED IN AREA NOT INCLUDED

NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

CITY OF BEATRICE, NEBRASKA
GAGG COUNTY

PANEL 15 OF 25
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
310091 0015 B

MAP REVISED:
JANUARY 3, 1985

Federal Emergency Management Agency

Appendix D

Worksheets to assist in future review, updates, and revisions of the plan.

Plan Goal(s)/Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of Success (e.g., losses avoided as a result of the acquisition program):

In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

Status (Please check pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):

Project Status

(1) Project on schedule

(2) Project completed

(3) Project delayed*

*explain: _____

(4) Project canceled

Project Cost Status

(1) Cost unchanged

(2) Cost overrun*

*explain: _____

(3) Cost under run*

*explain: _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other comments:

Worksheet #2: Evaluating Your Planning Team

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:

| | YES | NO |
|--|--------------------------|--------------------------|
| Have there been local staffing changes that would warrant inviting different members to the planning team? | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments/Proposed Action: | | |
| Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team? | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments/Proposed Action: | | |
| Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team? | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments/Proposed Action: | | |
| Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently? | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments/Proposed Action: | | |
| Are there ways to gain more diverse and widespread cooperation? | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments/Proposed Action: | | |
| Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning? | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments/Proposed Action: | | |

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.

Worksheet #3: Evaluate Your Project Results

Project Name and Number:

Project Budget:

Project Description:

Associated Goal and Objective (s):

Indicator of Success (e.g., losses avoided):

Insert location map

include before and after photos if appropriate

Was the action implemented?

IF YES



What were the results of the implemented action?

IF NO



Why not?

| | | |
|--|-----|----|
| Was there political support for the action? | YES | NO |
| Were enough funds available? | YES | NO |
| Were workloads equitably or realistically distributed? | YES | NO |
| Was new information discovered about the risks or community that made implementation difficult or no longer sensible? | YES | NO |
| Was the estimated time of implementation reasonable? | YES | NO |
| Were sufficient resources (for example staff and technical assistance) available? | YES | NO |

Were the outcomes as expected?
If No, please explain:

YES NO Additional comments or other outcomes:

Did the results achieve the goal and objective (s)?
Explain how:

YES NO



Was the action cost-effective?
Explain how or how not:

YES **NO**

What were the losses avoided after having completed the project?

If it was a structural project, how did it change the hazard profile?

Date _____

Prepared by: _____

Worksheet #4: Revisit Your Risk Assessment

| Risk Assessment Steps | Questions | YES | NO | COMMENTS |
|------------------------------|--|-----|----|----------|
| Identify hazards | Are there new hazards that can affect your community? | | | |
| Profile hazard events | Are new historical records available? | | | |
| | Are additional maps or new hazard studies available? | | | |
| | Have chances of future events (along with their magnitude, extent, etc.) changed? | | | |
| | Have recent and future development in the community been checked for their effect on hazard areas? | | | |
| Inventory assets | Have inventories of existing structures in hazard areas been updated? | | | |
| | Are future developments foreseen and accounted for in the inventories? | | | |
| | Are there any new special high-risk populations? | | | |
| Estimate losses | Have loss estimates been updated to account for recent changes? | | | |

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly

Worksheet #5: Revise the Plan

Prepare to update the plan.

When preparing to update the plan:

Check the box when addressed ✓

1. Gather information, including project evaluation worksheets, progress reports, studies, related plans, etc.

Comments:

2. Reconvene the planning team, making changes to the team composition as necessary (see results from *Worksheet #2*).

Comments:

Consider the results of the evaluation and new strategies for the future.

When examining the community consider:

Check the box when addressed ✓

1. The results of the planning and outreach efforts.

Comments:

2. The results of the mitigation efforts.

Comments:

3. Shifts in development trends.

Comments:

4. Areas affected by recent disasters.

Comments:

5. The recent magnitude, location, and type of the most recent hazard or disaster.

Comments:

6. New studies or technologies.

Comments:

7. Changes in local, state, or federal laws, policies, plans, priorities, or funding.

Comments:

8. Changes in the socioeconomic fabric of the community.

Comments:

9. Other changing conditions.

Comments:

Incorporate your findings into the plan.

When examining the plan:

Check the box when addressed ✓

1. Revisit the risk assessment.

Comments:

2. Update your goals and strategies.

Comments:

3. Recalculate benefit-cost analyses of projects to prioritize action items.

Comments:

Use the following criteria to evaluate the plan:

Criteria

YES NO Solution

Are the goals still applicable?

| | | |
|--|--|--|
| | | |
|--|--|--|

Have any changes in the state or community made the goals obsolete or irrelevant?

| | | |
|--|--|--|
| | | |
|--|--|--|

Do existing actions need to be reprioritized for implementation?

| | | |
|--|--|--|
| | | |
|--|--|--|

Do the plan's priorities correspond with state priorities?

| | | |
|--|--|--|
| | | |
|--|--|--|

Can actions be implemented with available resources?

| | | |
|--|--|--|
| | | |
|--|--|--|

Comments: