HAZARDS

INTRODUCTION

This chapter of *The Ankeny Plan 2040* contains the description of specific hazards within the planning area for the City of Ankeny. The 2010 Iowa Smart Planning language in Iowa Code provides thirteen smart planning elements that should be included in a Comprehensive Plan including a hazards element. Under the Iowa Smart Planning guidelines the requirement for hazards is as follows:

> *Objectives, policies, and programs that identify the natural and other hazards that have the greatest likelihood of impacting the municipality or that pose a risk of catastrophic damage as such hazards relate to land use and development decisions, as well as the steps necessary to mitigate risk after considering the local hazard mitigation plan approved by the Federal Emergency Management Agency.*

HAZARDS

The information within this chapter has been taken directly from the *Polk County, Iowa Multi-Jurisdictional Hazard Mitigation Plan* effective on July 2014. The material is from the Risk Assessment and Mitigation Strategies Chapters. Not all of the sections and tables have been directly included and any additional information should be obtained by reading the complete study. The only items modified for this chapter of *The Ankeny Plan 2040* are the table numbers and the elimination of section numbers in the document.

HAZARD MITIGATION PLAN

Chapter 3 of the *Polk County, Iowa Multi-Jurisdictional Hazard Mitigation Plan* rates 20 different hazards and rates them on Probability, Magnitude/Severity, Warning Time and Duration. Developing a successful hazard mitigation plan depends in large part on having a good understanding of the types of hazard events with the greatest impact on the community. These are the hazards to which mitigation efforts should be most targeted.

Figure 11.1 shows the ratings for each of the twenty hazards identified in the *Multi-Jurisdictional Hazard Mitigation Plan*. The following are the hazards with a High Level of potential:

- Flash Flooding
- HAZMAT Incident
- Structural Fire
- Transportation Incident
- Winter Storm

Those Hazards classified as Moderate are:

- Dam Failure
- Drought
- Human Disease
- Infrastructure Failure
- River Flooding
- Thunderstorm/Lightning
- Tornado
- Wind Storm

It is critical to monitor hazards, even those rated as Low Risk. The City should follow through with the developed goals and strategies. Successful mitigation will minimize the overall loss occurring from any hazard situation.

FIGURE 11.1 Composite Risk Assessment Ranking by Hazard - Ankeny

	Probability	Magnitude	Warning Time	Duration	Score	Level
Animal / Plant / Crop Disease	1	2	1	4	1.60	Low
Dam Fatigue	1	3	4	4	2.05	Moderate
Drought	3	1	1	4	2.20	Moderate
Earthquake	1	1	4	1	1.45	Low
Expansive Soils	2	1	1	1	1.45	Low
Extreme Heat	2	2	1	3	1.95	Low
Flash Flood	4	3	2	1	3.10	High
Grass and Wildlife Fire	3	1	1	1	1.90	Low
HAZMAT Incident	4	2	4	1	3.10	High
Human Disease	2	3	2	4	2.50	Moderate
Infrastructure Failure	2	2	4	4	2.5	Moderate
Levee Failure	N/A	N/A	N/A	N/A	N/A	N/A
River Flooding	4	2	1	4	2.95	Moderate
Sinkholes / Landslide	1	1	4	1	1.45	Low
Structural Fire	4	2	4	1	3.10	High
Thunderstorm / Lightning / Hail	4	2	3	1	2.95	Moderate
Tornado	4	2	3	1	2.95	Moderate
Transportation Incident	4	2	4	1	3.10	High
Windstorm	4	1	3	2	2.75	Moderate
Winter Storm	4	2	3	3	3.15	High

Source: Polk County, Iowa Multi-Jurisdictional Hazard Mitigation Plan 2014 and City of Ankeny

FIGURE 11.2 Risk Assessment by Hazard Definitions

Element/Score	Definitions
Probability: Reflects the likelihood of the hazard occuring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year	
1 - *Unlikely*	Less than 10% probability in any given year (up to 1 in 10 chance occuring), history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence
2 - *Occasional*	Between 10% and 20% probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur
3 - *Likely*	Between 20% and 30% probability in any given year (up to 1 in 3 chance of occurring), history of events is greater than 20% but less than 33% or the event is likely to occur
4 - *Highly Likely*	More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur
Magnitude / Severity: Assessment of severity in terms of injuries and fatalities, personal property, and infrastructure and the degree and extent with which the hazard affects the jurisdiction	
1 - Negligible	Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2 - Limited	10% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or injuries/illnesses that do not result in permanent disability
3 - Critical	25% to 50% of property severely damaged, shutdown of facilities and services for at least 2 weeks, and/or injuries/illnesses that result in permanent disability
4 - Catastrophic	More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths
Warning Time: Rating of the potential amont of warning time that is available before the hazard occurs. This should be taken as an average warning time	
1	More than 24 hours warning time
2	12 to 24 hours warning time
3	6 to 12 hours warning time
4	Minimal or no warning time (up to 6 hours warning)
Duration: A measure of the duration of time that the hazard will affect the jurisdiction	
1	Less than 6 days
2	Less than 1 day
3	Less than 1 week
4	More than 1 week
Using the rating scales described in the table above, the formula used to determine each hazard's score, including weighting factors, is provided below: (Probability X .45) + (Magnitude/Severity X .30) + (Warning Time x .15) + (Duration X .10) = SCORE	

Source: Polk County, Iowa Multi-jurisdictional Hazard Mitigation Plan, July 2014

FIGURE 11.3 Composite Risk Assessment Ranking by Hazard - Ankeny

Action ID	Mitigation Project /Activity Description	Primary Hazard Addressed	Existing or New Structures	Planning / Implementation Mech.	2017 Action Status	2017 Action Status Comment	Goal #	STAPLE Score	Priority
Ankeny 4	Construct safe rooms at Mel Ray Mobile Home Park	Tornado	New	Hazard Mitigation Plan	Not Started	Private residential mobile home facility currently without safe room (s)	4	32	Medium
Ankeny 5	Construct safe rooms at Autumn Ridge Mobile Home Park	Tornado	New	Hazard Mitigation Plan	Not Started	Private residential mobile home facility currently without safe room (s)	4	32	Medium
Ankeny 6	Sanitary sewer capacity improvements southeast area relief sewer	Flash Flooding	Existing	Hazard Mitigation Plan	Complete		4	37	High
Ankeny 7	Sanitary sewer capacity improvements southeast 2nd Avenue trunk interconnect	Flash Flooding	Existing	Hazard Mitigation Plan	Not Started		4	37	High
Ankeny 9	Sanitary sewer capacity improvements West Outfall Relief Sewer	Flash Flooding	Existing	Hazard Mitigation Plan	Complete		4	37	High
Ankeny 11	Storm sewer / channel improvements southeast 4th Street and Wanda storm sewer	Flash Flooding	Existing	Hazard Mitigation Plan	Complete		4	36	High
Ankeny 13	Storm sewer / channel improvements Tributary "A" Stream and Southeast Tributary to Four Mile Creek channel improvements	Flash Flooding	Existing	Hazard Mitigation Plan	Complete		4	36	High
Ankeny 16	Storm sewer / channel improvements Four Mile Creek bank stabilization	Flash Flooding	Existing	Hazard Mitigation Plan	In Progress	This project is approximately 30% complete at this time	4	29	Medium
Ankney 17	Reconstruct storm water detention - Packard Pond	Flash Flooding	Existing	Hazard Mitigation Plan	Not Started	No project scheduled at this time	4	29	Medium
Ankeny 18	Continue to comply with the NFIP by enforcing floodplain management ordinance, including regulating / monitoring new construction and substantial improvements in the SFHA; and participating in floodplain identification and mapping.	River Flooding	Existing	NFIP Floodplain Management Program	In Progress	Participated in multijurisdictional Fourmile Creek Study, which was completed in 2014. Assisted with providing floodway info for Firm map replacements.	2	33	High
Ankeny 19	Storm sewer / channel improvements - West First Street Storm Sewer Improvements	Flash Flooding	Existing	Hazard Mitigation Plan	Not Started	Assess need and prioritization for project with stormwater management study and master plan in 2018.	4	31	High
Ankeny 20	Embankment stabilization - NW Irvinedale Drive	Sinkholes / Landslide	Existing	Hazard Mitigation Plan	In Progress	Project included in CIP and is being designed at this time	2	29	High
Ankeny 21	Reconstruct storm water detention - Wildflower Public Pond improvements	Flash Flooding	Existing	Hazard Mitigation Plan	In Progress	Concept analysis of potential improvements to basin has been completed.	4	29	Medium
Ankeny 22	Storm sewer/channel improvements - SE Creekview Drive Improvements	Flash Flooding	Existing	Capital Improvements Program	In Progress	Project included in CIP is being designed at this time	4	30	Medium
Ankeny 23	Construct safe room(s) at One with Life Care Facility	Tornado	New	Hazard Mitigation Plan	Not Started		4	37	High

Source: Polk County, Iowa, Multi-Jurisdictional Hazard Mitigation Plan 2014 and City of Ankeny

HAZARDS GOALS + POLICIES

Goal 1: Work to reduce the extent of fatalities and injuries due to hazards

Policy 1.1 **- Continue providing education programs and exercises to first responders and the general public about hazards and how to respond**

Policy 1.2. **- Implement structural projects that will result in protection of life and safety including safe rooms and the continued improvement of stormwater drainage and capacity**

Policy 1.3 **- Ensure proper and adequate equipment for first responders including proper vehicles and equipment for fire and rescue, public works, and police**

Policy 1.4 **- Work on developing additional storm safety areas in new public places throughout the community**

Goal 2: Limit the extent of property loss due to hazards on existing properties

Policy 2.1 **- Bury utility lines in current and future development areas**

Policy 2.2 **- Inspect, clean, and maintain drainage systems throughout the community in order to minimize damming of large water flows**

Policy 2.2 **- Use the most effective approaches to protect buildings from other hazards using both structural and non-structural projects**

Policy 2.4 **- Provide training and education for homeowners, landlords, and first responders as to building protection**

Policy 2.5 **- Use the most effective approaches to protect buildings from flooding including acquisition or relocation when warranted**

Goal 3: Improve public response to hazards and make recovery easier

Policy 3.1 **- Continue to enhance the continuity of government during and after storms**

Policy 3.2 **- Continue to enhance cross-agency and intra- and inter-county communications**

Policy 3.3 **- Review and then continue to enhance or establish aid agreements, training, and exercises**

Policy 3.4 **- Ensure the mitigation plan is reviewed and updated as needed**

CONCLUSION

Chapter 11: Hazards is intended to address the requirements of the Iowa Smart Planning legislation passed in 2010. This chapter along with the Chapter 4: Environment will work in unison to meet the legislative criteria. For the purposes of this Comprehensive Plan, the risks associated with flooding were identified as having the greatest impact to the plan development. The Ankeny Plan 2040 recommends against development occurring within designated flood hazard area and that that minimum stream buffers be established as a setback for development from significant streams.

This chapter is not intended to replace the Hazard Mitigation Plan adopted in June 2014 by the City Council of Ankeny. Any specific information that is needed in this area not contained herein should be obtained by reviewing the entire Hazard Mitigation Study.