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# 2025 Multi-Hazard Mitigation Plan



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Photo credit: The tornado photo included on the 2025 Multi-Hazard Mitigation Plan title page is provided courtesy of Angie Gray Photography.

# Executive Summary

This updated community-specific Bismarck Multi-Hazard Mitigation Plan (MHMP) was originally developed and approved by the Federal Emergency Management Agency (FEMA) in 2015, again in January 2021, updated in 2025 and approved by FEMA and the ND Department of Emergency Services on **DATE**. The plan identifies and profiles the hazards to assess risk and vulnerability relating to natural, technological, and human-caused hazards, and identifies mitigation strategies and specific mitigation action items for reducing impact.

The Mitigation Strategy of this plan (see Section 2) is updated to align with and support the Bismarck Strategic Plan, approved by the city commission in 2025. Plan sections 3 through 5 identify, prioritize, and assign the mitigation action items that support the goals of this updated Multi-Hazard Mitigation Plan.

Although emergencies and disasters have impacted Bismarck, and can impact Bismarck in the future, actions can be taken ahead of time to reduce or eliminate the negative impacts. The 2025 MHMP represents the City's commitment to take action to lessen the impacts potential disasters may have on life, the economy, infrastructure and our ability to continue to operate as a community and city.

Much of the work in hazard mitigation and sustainable development must be carried out at the local level. It is at the local level where land use decisions are made, growth and development take place, and where the impacts of hazards are most direct. At the same time, some of the hazards with potential for catastrophic impact require mitigation efforts be pursued by key partners, including private industry, community partners, and state and federal government. Mitigating hazards is a "whole community" effort.

This Bismarck Multi-Hazard Mitigation Plan identifies numerous hazard-specific mitigation capabilities of our city departments and partners, as well as numerous mitigation actions (both new and ongoing) to continue mitigating all hazards. Section 3 of the MHMP provides for a summary of the following for each hazard addressed in the plan: 1) a summary of applicable mitigation action items per hazard, 2) a summary of primary vulnerabilities relating to each hazard, and 3) a summary of hazard-specific mitigation capabilities (completed or routine activities) which are relevant when analyzing hazard risk and community vulnerability to each hazard.

Throughout the plan update process, Bismarck conducted a thorough analysis of each hazard, including vulnerability assessments and identified opportunities to mitigate hazards. In addition to collaborative efforts among city staff, the plan is updated based on input from the public as well as participation from community partners. The planning process is outlined in Section 12.

The hazards identified within the table on the next page are each profiled for the purpose of identifying risk and vulnerabilities, and ultimately, to identify feasible mitigation opportunities. A hazard profile (see section 9) as well as applicable mitigation actions (see Section 3) are identified for each of the hazards.

Based on probability, potential impacts, and current response and mitigation capabilities, the hazards are prioritized as follows for the City of Bismarck:

**\*Hazard Ranking**

	Natural Hazards	Technological or Human Caused
High	Winter Storm Tornado	Cyberattack
Moderate	Severe Summer Weather Flood Infectious Disease	Hazardous Materials Release Train Derailment Active Threat Civil Disturbance
Low	Drought Geologic Hazard Pest Infestation Wildland Fire Space Weather	Fire Dam Failure Aircraft Accident Terrorist or Nation-State Attack

\*The purpose of ranking hazards, per planning requirements established by the Federal Emergency Management Agency, is to aid in prioritizing mitigation efforts and funding. However, it's understood that all approved mitigation action items are important and may be addressed based on the availability of required resources.

Three Hazards were added to the 2025 Multi-Hazard Mitigation Plan update:

- Cyberattack
- Space Weather
- Terrorist or Nation-State Attack

## Multi-Hazard Mitigation Plan (MHMP) Goals

See Section 2: Mitigation Strategy for additional information.

**MHMP Goal #1:** Reduce the occurrence or impact of natural and man-made emergencies that are common or have significant potential to occur in our community by planning and educating the public.

**MHMP Goal #2:** Strengthen public health, emergency preparedness, and environmental safety to protect community well-being.

**MHMP Goal #3:** Expand and strengthen community-based services to support vulnerable populations.

**MHMP Goal #4:** Safeguard the community by providing appropriate personnel and equipment capable of effectively mitigating natural and man-made emergencies which are common or have significant potential to occur in our community.

**MHMP Goal #5:** Leverage technology and infrastructure to strengthen public safety, improve emergency response, and support proactive community protection and mitigation efforts.

**MHMP Goal #6:** Enhance community understanding and awareness of hazards and participation in mitigation planning and emergency/disaster preparedness.

**MHMP Goal #7:** Strengthen cybersecurity measures and enhance data governance to protect information assets and ensure regulatory compliance.

**MHMP Goal #8:** Improve disaster resilience to current and future buildings, structures, and infrastructure systems.

The Mitigation Strategy of this plan (see Section 2) is updated to align with and support the Bismarck Strategic Plan, approved by the city commission in 2025. Plan sections 3 through 5 identify, prioritize, and assign the mitigation action items that support the goals of this updated Multi-Hazard Mitigation Plan.

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PLACEHOLDER

Resolution Adopting the Multi-Hazard Mitigation Plan for the City of Bismarck, ND.

*After plan approval by ND Department of Emergency Services and the Federal Emergency Management Agency.*

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# Introduction

## Defining Mitigation

Mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to people and property from natural, technological, or human-caused hazards and their effects. Effective mitigation actions will achieve one or more of the following:

- Break the cycle of damage
- Promote Community Resilience
- Reduce the risk to human life and safety

Mitigation is taking action **NOW, BEFORE** the next disaster or significant hazard event, to reduce human and financial consequences in the future. Effective mitigation requires that we **ALL** understand local risks, address the hard choices and invest in long-term community well-being. Without mitigation actions, we jeopardize our safety, financial security and self-reliance.

## Purpose

The Bismarck Mitigation Plan has been developed to serve the Bismarck community through mitigation of potential impacts of natural and human-caused hazards. By avoiding unnecessary exposure to known hazards, a community may save lives, protect property, and minimize the social, economic, and environmental disruptions that commonly follow hazard events.

The primary purpose of the plan is to identify mitigation strategies. Therefore, in developing the plan, the focus was to identify mitigation strategies based on the significant vulnerabilities identified through the planning process.

The purpose of mitigation planning and implementing the plan is to protect life, property, environment, economy, and quality of life within the City of Bismarck from hazards/disasters.

The purpose of the mitigation plan is to:

- Serve as a consolidated, comprehensive source of hazard information.
- Inform our leaders and the public of our vulnerabilities.
- Prioritize and promote cost-effective mitigation solutions.
- Encourage long-term community sustainability.
- Improve coordination of mitigation efforts.
- Support the 2025 Bismarck Strategic Plan

## Scope

The Bismarck Multi-Hazard Mitigation Plan was prepared to address those hazards identified which pose significant risk to Bismarck. Additional hazards may exist that were not apparent to the mitigation plan stakeholders through the development of this plan, and certainly, disasters can occur in unexpected ways. Future planning efforts may address additional hazards as determined appropriate.

### **Authority**

The North Dakota Century Code, Chapter 37-17.1 Emergency Services, requires cities and to develop and maintain an emergency management program (or participate in a county or regional program).

The Disaster Mitigation Act of 2000 requires local governments to develop and submit mitigation plans as a condition of receiving Hazard Mitigation Grant Program (HMGP) and other applicable mitigation grants. The Disaster Mitigation Act of 2000 became law on October 30, 2000, and amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the “Stafford Act”) (P.L. 93-288, as amended). Regulations for this activity can be found in 44 CFR, Part 201.

The City of Bismarck Multi-Hazard Mitigation Plan meets the requirements and procedures for a local mitigation plan as found in the Code of Federal Regulations (CFR), Title 44, Chapter 1, Part 201 (44 CFR Part 201). This Bismarck Multi-Hazard Mitigation Plan has been prepared by Bismarck Administration/Emergency Management.

### **Overview of Bismarck, North Dakota.**

See plan section 7: Community Profile.

### **Plan Format**

The plan document is formatted based on the purpose of the plan (ie: mitigation strategy) and also to ensure the document is user-friendly for those who are assigned to implement mitigation action items. Since the mitigation strategies and action items are the *results* of the planning process, the mitigation strategy including action items are the focus of the plan document. The other plan sections which contribute to and inform the mitigation strategy and specific hazard mitigation actions follow.

## Plan Organization – Purpose of Plan Sections

**Section 1: Introduction** explains the purpose, organization, scope, and authority of the plan.

**Section 2: Mitigation Strategy** identifies the mitigation plan purpose and overarching goals to minimize potential impact from hazards. Sections 3 through 6, cumulatively, outline the mitigation strategy including the applicable mitigation action items.

**Section 3: Hazard Vulnerability & Mitigation Actions Summary** highlights the results of the mitigation planning process to include identification of mitigation actions based on vulnerabilities as well as identifying mitigation capabilities specific to each hazard. This section also summarizes vulnerabilities for each hazard based on more detailed vulnerability assessments within each hazard profile within Section 9 of the plan.

**Section 4: Mitigation Implementation Action Plan** identifies the mitigation action item assignments and is organized by name of city department. This section will allow for effective tracking of mitigation action items.

**Section 5: Mitigation Actions – Prioritizing** outlines the priority level of mitigation action items identified.

**Section 6: Integration of Plans and Program and Mitigation Capabilities Inventory** is an assessment of local mitigation capabilities and identifies the informational resources (ie: plan, programs) that were reviewed and integrated into the plan. Additional hazard-specific mitigation capabilities are identified in Section 3 where applicable.

**Section 7: Community Profile** provides an overview of the City of Bismarck, ND.

**Section 8: Community Assets** provides a visual representation of an inventory list of community assets including critical facilities, critical infrastructure, vulnerable populations, and hazardous materials facilities. An inventory list of community assets is used to assist in the planning efforts in developing each of the hazard profiles (ie: vulnerability).

**Section 9: Hazard Profiles** provides detail on each of the hazards including a hazard description, risk assessment, and vulnerability assessment. Vulnerability summaries (section 3) are based on the vulnerability assessment within each hazard profile.

**Section 10: Risk Assessment** provides an overview of hazards identified to be addressed in the plan as well as a summary of comparative hazard ranking based on risk (probability) and overall impact. The methodology, including additional considerations for hazard ranking and integration of the Threat and Hazard Identification and Risk Assessment (THIRA) process is explained.

**Section 11: Plan Maintenance** describes the approach to monitoring, evaluating, and updating the plan.

**Section 12: Planning Process and Public Input** explains who was involved and how the plan was prepared and describes public input opportunity and plan integration.

**Appendices** include Acronyms used throughout the document and Climate data for Bismarck.

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# Mitigation Strategy

This section outlines the purpose of mitigation and identifies the community's mitigation goals. The Mitigation Strategy of this plan is updated to align with and support the Bismarck Strategic Plan, approved by the city commission in 2025.

**Purpose of the Multi-Hazard Mitigation Plan:** Identify Mitigation Goals and Action Items to minimize risk and vulnerability to protect the life and health of people, property, environment, and economy of Bismarck from potential impacts of natural, technological, and human-caused hazards.

The Bismarck Strategic Plan identifies Focus Areas, Goals, and Objectives which establish community priorities and in turn, provide direction in setting the Multi-Hazard Mitigation Plan Strategy and Goals for this Multi-Hazard Mitigation Plan update.

Strategic Plan Focus Areas	Description
Infrastructure and Development	The City of Bismarck recognizes that robust, resilient, and forward-thinking infrastructure is fundamental to the community's well-being, economic vitality, and quality of life. As our city continues to grow and evolve, it is essential to develop and maintain facilities, systems, policies and practices that not only meet today's demands but also anticipate future needs.
Economic Vitality	The City of Bismarck is committed to fostering a vibrant and resilient economy that supports sustainable growth, expands local employment opportunities, and attracts new investment. Recognizing that economic vitality is critical to the overall quality of life and long-term prosperity, this strategic focus area emphasizes collaboration with partners, modernization of business processes, and thoughtful community planning.
Safe and Healthy Community	The City of Bismarck is committed to fostering a safe, healthy, and inclusive environment where all residents can thrive. The Safe and Healthy Community strategic focus area reflects a comprehensive approach to public safety, health, and well-being—grounded in collaboration, innovation, and proactive service delivery.
Emerging Issues	As the pace of technology, organizational policy, and public expectation evolve and accelerate, the City of Bismarck must continue to adapt and be proactive in its approaches, anticipating challenges before they arise and positioning the organization to respond strategically..
Engaged and Informed Community	As Bismarck continues to grow and evolve, effective communication must go beyond simply sharing information. It should build trust, bridge divides, and empower residents to actively shape the community's future. An engaged and informed community should view the City of Bismarck as a trusted partner and the City should, in turn, recognize its residents as essential partners in shaping a vibrant and responsive community.

Desirable Lifestyle	The City of Bismarck is dedicated to cultivating a vibrant community where residents enjoy a high quality of life enriched by meaningful connections, cultural heritage, and accessible amenities. This strategic focus on Desirable Lifestyle emphasizes the importance of well-designed public spaces, strong community partnerships, and dynamic programming that engage people of all ages and backgrounds.
Organizational Excellence	The City of Bismarck is committed to achieving organizational excellence by investing in its workforce, optimizing internal operations, and fostering a culture of innovation, accountability, and service. This focus area reflects a strategic commitment to building a high-performing organization that can effectively meet the evolving needs of the community, adapt to future challenges, and deliver high-quality public services.

Five of the Strategic Focus Areas and several goals and objectives identified within the Strategic Plan are utilized to establish consistent goals within this updated Multi-Hazard Mitigation Plan (MHMP).

The mitigation actions identified within this plan to support the goals include mitigation actions classified under the following categories:

- Planning and Regulatory actions
- Structural and Infrastructure actions
- Nature-Based Mitigation
- Public Education, Technical Assistance, and Partnerships

Mitigation Action Items developed for each hazard are not all inclusive and the City of Bismarck reserves the right to modify actions, objectives, and goals as necessary to address mitigation needs as they arise. Future occurrences, new technology, or unforeseen events could result in the modification of actions outlined in this plan, or may result in the identification of a new action item not previously identified in this plan.

All of the Mitigation Action Items identified within this plan are considered Short-Term Strategies to be completed within 3 to 5 years, or prior to the next plan update. However, many of the mitigation action items are on-going or remain relevant beyond 5 years. As Mitigation Action Items are completed or become routine practice, they are identified as mitigation capabilities instead. Section 3 of this plan document identifies hazard-specific mitigation capabilities and Section 6 is an inventory mitigation capabilities relating to all hazards.

## 2025 Bismarck Multi-Hazard Mitigation Plan (MHMP) Updated Goals

### *Safe and Healthy Community Focus Area*

**MHMP Goal #1:** Reduce the occurrence or impact of natural and man-made emergencies that are common or have significant potential to occur in our community by planning and educating the public.

**MHMP Goal #2:** Strengthen public health, emergency preparedness, and environmental safety to protect community well-being.

**MHMP Goal #3:** Expand and strengthen community-based services to support vulnerable populations.

**MHMP Goal #4:** Safeguard the community by providing appropriate personnel and equipment capable of effectively mitigating natural and man-made emergencies which are common or have significant potential to occur in our community.

**MHMP Goal #5:** Leverage technology and infrastructure to strengthen public safety, improve emergency response, and support proactive community protection and mitigation efforts.

### *Engaged and Informed Community Focus Area*

**MHMP Goal #6:** Enhance community understanding and awareness of hazards and participation in mitigation planning and emergency/disaster preparedness.

### *Organizational Excellence Focus Area*

**MHMP Goal #7:** Strengthen cybersecurity measures and enhance data governance to protect information assets and ensure regulatory compliance.

### *Infrastructure and Development, and Economic Vitality Focus Areas*

**MHMP Goal #8:** Improve disaster resilience to current and future buildings, structures, and infrastructure systems.

*Note: The goal numbering scheme above is specific to this plan document, and does not use the same goal numbers as assigned within the Bismarck Strategic Plan.*

Previous Goals:

The following mitigation goals from the previous plan are integrated within the updated mitigation plan goals above (synonymous).

- Reduce the impacts natural disasters may have on people and property. (See goal 1 above)
- Reduce impacts of technological and human-caused disaster may have on people and property. (See goal 1 above)
- Enhance local planning efforts related to hazard understanding and mitigation. (See goal 6 above)
- Reduce the impact future development has on potential losses and vulnerabilities. (See Goal 8 above)

### Summary of Priority Changes

MHMP Goal #3 and Goal #7 are new priorities for this updated mitigation plan, and are based on the current Strategic Plan. Applicable mitigation action items are included within this plan to support the new goals.

Additional hazards included in this plan update include Cyberattack, Space Weather, and Terrorist or Nation-State Attack. Goals #5 and #7 support the inclusion of these hazards and efforts to mitigate the hazards.

The revision to the 100-year floodplain (and flood insurance rate map) is a significant change for Bismarck and area residents. Although this change didn't require a change in mitigation goals, the identification of potential solutions and efforts to mitigate the impact were identified as a priority and have been initiated prior to the update of this mitigation plan.

The previous plan included "Shortage or Outage of Critical Materials or Infrastructure" as a hazard. The primary issues and related mitigation action items were associated with power outages. This hazard was removed from this updated plan and the relevant content such as vulnerabilities and mitigation action items were integrated into the Winter Storm, Terrorist or Nation-State Attack, and Space Weather hazards.

## Mitigation Action Items

Mitigation Action Items, as part of the Mitigation Strategy, are identified within these subsequent plan sections:

- Section 3: Hazard Vulnerability & Mitigation Actions Summary
  - Identifies mitigation action items per hazard, as well as applicable vulnerabilities and mitigation capabilities applicable to each hazard.
- Section 4: Mitigation Implementation Action Plan
  - Identifies the mitigation action items and city departments assigned to implement each mitigation action item.
  - Identifies the status of mitigation action items.
- Section 5: Mitigation Actions: Prioritizing
  - Includes a cumulative list of all mitigation action items and assigns priority level based on methodology as explained within Section 5.

## Developing the Mitigation Strategy

The mitigation purpose statement and goals were reviewed and updated during the plan update kick-off meeting (Mitigation Plan Steering Committee) and again as a result of completion of the city's updated Strategic Plan. Priorities and goals were again reviewed by City Administration and the Multi-Hazard Mitigation Plan Steering Committee to finalize the plan.

As part of the hazard mitigation planning kick-off meeting, hazards were identified to be included in the mitigation plan. Also, hazard specific mitigation planning teams made up of various city departments and community stakeholders were established to address each hazard for the purpose of updating or developing hazard profiles, identifying vulnerabilities, and identifying and evaluating mitigation ideas. The results of the hazard-specific mitigation planning team meetings were then reviewed by the MHMP Steering Committee for final revisions and to provide preliminary approval.

The initial public input survey conducted jointly by Bismarck and Burleigh County validated the inclusion of Cyberattack within this mitigation plan update as well as the goals identified in this plan to address technological and human-caused hazards as well as natural hazards.

As a result of the final public input opportunity, (summarize any changes to the mitigation strategy)

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# Hazard Vulnerability & Mitigation Actions Summary

- Mitigation Actions Identified – Hazard Specific
- Vulnerability Summaries – Hazard Specific
- Mitigation Capabilities Inventory – Hazard Specific

This plan section outlines the mitigation actions identified to address each hazard and includes a vulnerability assessment narrative summary for each hazard based on the hazard profiles in Section 9. The identified vulnerabilities validate the need or purpose of the identified mitigation actions. Not all vulnerabilities are addressed by specific mitigation actions. In some cases, a proposed mitigation idea may not be feasible or within the authority or jurisdiction of the city. Regardless, vulnerabilities are identified, even if there is not a current solution or related mitigation action identified.

This plan section also identifies mitigation capabilities specific to each hazard. The listing of capabilities illustrates the efforts of Bismarck and community partners in mitigating each of the hazards. Capabilities listed may be completed mitigation action items that remain in place and/or routine mitigation activities conducted on a regular basis. Section 6 also provides for an inventory of mitigation capabilities applying to all hazards or multiple hazards.

Section 9 contains a hazard profile for each hazard. **The hazard profiles in Section 9 contain a description of the hazard as well as more detail regarding potential magnitude and extent of the events, vulnerability analysis, and history of previous occurrences.** The purpose of this Plan Section 3 is to highlight the identify mitigation action items to address each hazard, as well as provide for an overview of vulnerability and a listing of hazard-specific mitigation capabilities where applicable.

The summary of mitigation actions, vulnerabilities, and mitigation capabilities specific to each hazard within this section are sorted **alphabetically by hazard name.**

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# Active Threat

Note: For purposes of safety and security, specific vulnerabilities and mitigation projects will not be presented in this plan for this hazard. General mitigation recommendations and existing mitigation capabilities are identified. A hazard profile for this hazard is included in Section 9 of this plan.

## Mitigation Actions

1. Invest in a real-time crime center and deploy advanced analytics technologies in high-traffic and high-risk areas to support rapid response, crime prevention, and data-driven decision-making.
2. Continue those mitigation capabilities already in place as summarized below.
3. Provide for training opportunities in how to plan, prepare, and mitigate potential Active Threat / Active Attack incidents. Promote opportunities internally (city departments) and externally (community). (CRASE: Civilian Response to Active Shooter Events).
4. Recommendation for city facilities and public/private critical infrastructure entities: Request a site assistance visit from the Bismarck Police Department or the ND State and Local Intelligence Center to facilitate identification of vulnerabilities and identify mitigation options. [State Assistance Visit - NDSLIC](#)

Public Education topics:

5. Promote availability and conduct on-going public education and training regarding the Active Attack hazard using the “Avoid, Deny, Defend” concepts outlined via ALERTT.

## Capabilities

### Existing Mitigation Capabilities Specific to the Active Threat Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. The Bismarck Police Department has developed various crime prevention programs and conducts crime prevention presentations for the public upon request.
  - **Crime Prevention Programs include Neighborhood Crime Watch, Operation Identification, Security Surveys, Crime Stoppers, Apartment Association Background Checks, and Safe Rental Housing Program.** <http://www.bismarcknd.gov/index.aspx?NID=399>
  - Crime Prevention Presentations topics and descriptions are available on the web at <http://www.bismarcknd.gov/index.aspx?NID=398>
2. The Bismarck Police Department offers facility security assessments. Upon request, a specially trained officer will come to your home or business and make an assessment of your physical security. The officer will then make recommendations, if needed, on areas where it can be improved.
3. Bismarck PD, in conjunction with the Bismarck Public School system, has developed a Threat Assessment Team. The team includes both police and school representatives including investigators, counselors, and applicable parents. Threats are analyzed to determine viability or credibility and to determine if prosecution or other action (ie: referral) is necessary.
4. Bismarck PD conducts lethality assessments to determine the likelihood of domestic violence situations (case by case basis). As part of the lethality assessment protocol, appropriate referrals may be made.
5. Bismarck PD shares intelligence with ND State and Local Intelligence Center (ND SLIC).
6. The ND SLIC provides for public education including facility security assessment guidelines.
7. ND SLIC promotes “If You See Something, Say Something” public education awareness campaign. Signs are currently posted at the Bismarck Airport (“If You See Something, Say Something”).
8. Personnel at Bismarck PD have participated in the ALERTT train-the-trainer program. <http://alerrt.org/>
9. Bismarck PD Officers provide “Civilian Response to Active Shooter Events” training for Bismarck

Public Schools, Bismarck City departments/staff as well as area businesses upon request.

10. MOCIC (Mid-States Organized Crime Information Center) alerts are received by Bismarck PD officials which provide information about criminal activity in the upper Midwest.
11. Bismarck PD coordinates, conducts and participates in applicable training and exercise activities with area schools and businesses, including recent full scale “active shooter” exercises.
12. Homeland Security grants are made available through the ND Department of Emergency Services. Eligible grant projects include physical safety features such as ballards, lighting, bulletproof glass, and cameras.
13. Bismarck PD response capabilities include:
  - Bismarck PD Active Threat Response Plan
  - West Dakota SWAT/Crisis Negotiation Team (multi-jurisdictional regional team)
  - Bismarck PD Bomb Team (FBI Certified)
  - Bismarck PD K9 Team
  - Bismarck PD Unmanned Aircraft Systems Team (UAS)
  - Bismarck PD Mobile Field Force Team
  - Mutual Aid with other law enforcement agencies

## Mitigation Recommendations

### Building Security Risk Mitigation Recommendations

#### Procedures:

- Conduct a realistic security assessment to determine the facility’s vulnerability to an active shooter attack.
- Identify multiple evacuation routes and practice evacuations under varying conditions; post evacuation routes in conspicuous locations throughout the facility; ensure that evacuation routes account for individuals with special needs and disabilities.
- Designate shelter locations with thick walls, solid doors with locks, minimal interior windows, first-aid emergency kits, communication devices, and duress alarms.
- Designate a point-of-contact with knowledge of the facility’s security procedures and floor plan to liaise with police and other emergency agencies in the event of an attack.
- Incorporate an active shooter drill into the organization’s emergency preparedness procedures.
- Vary security guards’ patrols and patterns of operation.
- Limit access to blueprints, floor plans, and other documents containing sensitive security information, but make sure these documents are available to law enforcement responding to an incident.
- Establish a central command station for building security.

#### Systems:

- Put in place credential-based access control systems that provide accurate attendance reporting, limit unauthorized entry, and do not impede emergency egress.
- Put in place closed-circuit television systems that provide domain awareness of the entire facility and its perimeter; ensure that video feeds are viewable from a central command station.
- Put in place communications infrastructure that allows for facility-wide, real-time messaging.
- Put in place elevator systems that may be controlled or locked down from a central command station.

#### Training:

- Train building occupants on response options outlined by ALERRT. <http://alerrt.org/>
  - **Avoid, Deny, Defend** These core concepts incorporate the response options of “Run, Hide, Fight,” while providing for a more thorough explanation of additional response options within “Avoid, Deny, Defend.”

# Aircraft Accident

## Mitigation Actions

1. Maintain the current airport hazard mitigation efforts, and emergency response plans and planning efforts listed within the existing Mitigation Capabilities table below.
2. Recommend Burleigh County and city of Lincoln adopt city of Bismarck aeronautical zoning where applicable based on the city of Lincoln growing nearer to the Airport. (completed)
3. Update the Wildlife Hazard Assessment.

## Vulnerability Summary

*Refer to the "Vulnerability Assessment" table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. The city of Lincoln is within the air traffic pattern of the Bismarck Airport (within the Accident Potential Zone).
2. The highest population and number of properties within 15,000 feet (within the Accident Potential Zone (APZ)) of the Bismarck Airport are northwest of the airport based on the alignment of the runway running NW/SE. Properties and populations within that distance include CHI St. Alexius Health, Sanford Health, the State Capitol, five mobile home parks, twelve schools, and Bismarck critical facilities including Bismarck Police Department, the City/County Building and Bismarck Burleigh Public Health.
3. The most vulnerable population are the crew members and frequent travelers based on extensive use of aircraft (higher use equals higher risk or probability).
4. The potential for inappropriate (illegal) use of drones within proximiting, either intentionally or unintentionally provides for additional vulnerability (interaction between drones and aircraft).

## Capabilities

### Existing Mitigation Capabilities Specific to the Aircraft Accident Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. The City of Bismarck utilizes ordinances to control land use and building height, as well as minimize or eliminate lighting, radio or wildlife interference with airport operations. See Title 10-09 (airport zoning regulations) and Title 14 (zoning).  
<http://www.bismarcknd.gov/index.aspx?NID=90>
2. The Bismarck Airport maintains the following Hazard Mitigation and Emergency Response Plans and Programs:
  - Airport Certification Manual
  - Airport Emergency Plan
  - Airport Security Program
  - Wildlife Hazard Management Plan
  - Environmental Assessments
  - Wetland Mitigation
  - Spill Prevention Control and Countermeasure (SPCC)
  - Bismarck Airport Master Plan Update: <https://www.bismarckairport.com/143/2019-Airport-Master-Plan>

The Airport Certification Manual (ACM) provides direction and lines of responsibility in the day-to-day operation of the Bismarck Airport. Various other plans including the Airport Emergency Plan, Hazardous Materials, Wildlife Hazard Management Plan, are found in the ACM. The ACM outlines specifically the duties and responsibilities of individuals responsible for meeting the requirements set forth in the various manuals.

The Airport Emergency Plan assigns responsibility to organizations and individuals for carrying out specific actions at projected times and places in responding to an emergency. As a requirement of the Airport Emergency Plan the airport must conduct on a triennial basis a “Full Scale Emergency Exercise.” The purpose of the exercise is for local emergency organizations to gain practice and preparedness for a response in the event of a major aircraft disaster. The Airport Security Program outlines specific guidelines to ensure security. The security program includes not only airport personnel but Transportation Security Administration and Security Personnel. This includes but is not limited to access control systems, background checks for hiring employees, identification systems, TSA screening, as well as response procedures for emergencies such as a civil disturbance, hijacking, bomb threat and other situations that may occur at the Bismarck Airport.

The wildlife hazard management plan developed in conjunction with the USDA is a plan to mitigate hazards before they occur and to respond to wildlife hazards whenever they are detected or reported. The plan spells out duties and responsibilities of personnel responsible for mitigating wildlife hazards. The plan established responsibilities such as a wildlife coordinator, a wildlife hazard committee that meets annually to discuss current wildlife issues, update permits, as well as changes in ongoing actions that result in preparedness and reduction of wildlife hazards. It also established a wildlife hazard patrol and spells out ongoing mitigation steps for airport staff.

Spill Prevention Control and Countermeasure provides a plan for discharge reporting procedures, containment, inspection and testing, personnel training, and security at the oil storage facilities located on site. The Airport also has a Storm Water Pollution Plan to comply with environmental laws and to protect storm water from contaminants and procedures in the event of storm water pollution.

Environmental Assessments are done whenever a project could potentially impact the environment. They provide the airport with information about the impact of the project on the environment and what needs to be done in order to disturb the environment the least.

# Civil Disturbance

Note: For purposes of safety and security, specific vulnerabilities and mitigation projects will not be presented in this plan for this hazard. General mitigation recommendations and existing mitigation are identified. A hazard profile for this hazard is included in Section 9 of this plan.

## Mitigation Actions

1. Continue preparedness, training, and mitigation activities already in place as summarized in the table below (see “Capabilities”).
2. Encourage the state of ND to fund support for civil disturbance teams to facilitate training as well as equipment needs in order to support mitigation, prevention, and response capability.

## Capabilities

### Existing Mitigation Capabilities Specific to the Civil Disturbance Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. Bismarck Police Department staff meet with event organizers (primary points of contact) prior to events to learn of event size (expected total participants), event location, time and date and other event specifics. A permitting process is established and permits are encouraged to be completed, but cannot be mandated based on United States case law.
2. The Bismarck Police Department, as well as the ND Highway Patrol and other larger cities within ND (Fargo, Minot, Jamestown, and Grand Forks), have staffed civil disturbance teams.
3. Following the 2016-17 DAPL civil disturbance, and the lessons learned from it, the Bismarck Police Department and other agencies began forming civil disturbance teams by sending officers to the FEMA Field Force Training Center. The BPD has a civil disturbance team (when fully staffed includes 30 officers) which includes a front line team and an extrication team. Bismarck PD is equipped with the appropriate equipment and tools to respond anywhere within our jurisdiction and to assist other agencies when requested. In May of 2025, the BPD, ND HP and ND Parole and Probation teams held a coordinated training event to better prepare for civil disturbances in and around our respective jurisdictions. This integration will continue on a yearly basis to remain prepared and equipped.
4. Homeland Security grants are made available through the ND Department of Emergency Services. Eligible grant projects include physical safety features such as ballards, lighting, bulletproof glass, and cameras.
5. Bismarck PD staff provide “Avoid, Deny, Defend” training for city staff, school staff, and the broader community upon request.
6. The NDES-HSEM is working with the ND State Library to create mis/dis/mal information literacy kits, intended to aid the public in identifying and/or correcting these information elements and combat the spread of misinformation/misinformation/disinformation. These kits will give the public and students skills to identify bias and information variation throughout our media today in addition to safe internet practices to include online gaming platforms.

# Cyberattack

## Mitigation Actions

1. Review Cybersecurity policies and procedures annually.
2. Engage third parties to perform cybersecurity review and establish security goals.
3. Conduct cybersecurity training and tabletop exercises with staff.
4. Continue existing mitigation capabilities as listed within the Capabilities table on the next page.
5. Promote (internally) the recommended mitigation actions as listed within the Cyberattack hazard profile within Section 9 of this plan document.
6. Maintain internal documentation regarding mitigation goals and action items recommended. Communicate mitigation goals and priority action items internally with appropriate city staff.

## Vulnerability Summary

1. The Cyberattack Hazard profile outlines typical vulnerabilities of local government organizations as well as mitigation actions recommended as best practices, applicable to the various vulnerabilities. See Section 9, Cyberattack Hazard Profile.
2. Specific vulnerabilities (to the City of Bismarck entity) are identified by the Bismarck IT department. To avoid compromise in cybersecurity, vulnerability details are not made available publicly.
3. Any computer connected to the internet has the possibility of being targeted by a cyberattack, including home computers. Any technological device that relies on the internet may also be a target.
4. In the event Electric Power is the target for a cyberattack, there would likely be a cascading effect impacting multiple critical infrastructure sectors including communications, energy production and distribution, transportation, water purification and distribution, emergency services, banking and finance, and government services.

## Capabilities

### Existing Mitigation Capabilities Specific to the Cyberattack Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. Bismarck IT maintains a list of mitigation action items completed as well as those to be continued (on-going).
2. Specific mitigation action items are identified by Bismarck IT. To avoid compromise in cybersecurity, specific mitigation action item goals are not made available publicly.
3. Bismarck IT, via support from the Paragon Policy Program, completed the city's cyber response plan (September 2025).

*Note: The City of Bismarck IT department provides internal services for Bismarck City Departments, and does not provide IT services, assessments, or cyber response to external entities.*

#### External Capabilities

4. The ND Information Technology department has had a central authority on cybersecurity since 2019. With the passage of state Senate Bill 2110, the state has taken an approach to unify all agencies in the state, including law enforcement, local government, and public education, around a cybersecurity strategy.
5. CyberCon, a critical infrastructure and cybersecurity conference, has been held in North Dakota annually starting in 2017 at Bismarck State College, with the goal of unifying cybersecurity and critical infrastructure professionals.
6. Cybersecurity public education efforts are conducted at the state level by NDIT and entities such as Bismarck State College. [www.defend.nd.gov](http://www.defend.nd.gov)

# Dam Failure

## Mitigation Actions

1. Locate new critical facilities outside inundation area when possible: When building, remodeling, or relocating critical facilities, the City of Bismarck should provide additional consideration or preference for location options outside of the dam failure inundation area. Because the probability of a catastrophic dam failure is very low, locating critical facilities outside the inundation area is NOT a requirement. However, assuming there are viable location options outside of the inundation area of equal value and functionality, locating outside the inundation area would reduce the loss potential.
2. Establish Awareness (public education) of the potential impact of Heart Butte Dam. Note: It's not a new hazard or vulnerability, but not well known or understood.
3. Participate in Heart Butte Dam emergency action plan reviews.
4. Promote the purchase of flood insurance (National Flood Insurance Program) – community wide.
5. Support public awareness efforts relating to planned maintenance and repair projects relating to the Garrison Dam as well as the Heart Butte Dam.
  - Primary public communications relating to the Garrison Dam Project : US Corp of Engineers
  - Primary public communications relating to the Heart Butte Dam Project: Bureau of Reclamation

## Vulnerability Summary

*Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

Based on catastrophic failure of the Garrison Dam:

1. The City of Bismarck has a significant investment in a number of critical facilities within the inundation area as mapped including the Water Treatment Plant, Wastewater Treatment Plant, Police Department, South Fire Station, Airport, Public Works, Public Health, the Event Center, and Northern Plains Commerce Centre. Also, a new Fire Station in south Bismarck will be within the inundation area.
2. Continuity of Government and Continuity of Operations capability would be compromised as a result of personal impact to city staff as well as direct impact to an extensive number of critical facilities as noted above in #1.
3. The city's water and waste-water treatment plants are a significant vulnerability to a dam failure. Impact to these critical facilities / critical infrastructure utilities would have an adverse impact to the entire community, including the properties and population not directly flooded.
4. The most vulnerable population would be those within the inundation area who are non-ambulatory and require evacuation assistance. There is a limited amount of time to identify those persons and ensure assistance is provided after notification of a dam failure.
5. The population of those within the hospitals and other institutions requiring evacuation are highly vulnerable. Evacuation requirements for facilities and populations outside of the inundation area would depend on impact to the water treatment plant and other utility lifelines.
6. The population of the ND State Penitentiary is of high vulnerability due to limited time to evacuate.
7. Both the BNSF railroad and the DMVRR railroad are within the mapped inundation area for dam failure.

8. Structural mitigation to minimize or eliminate the inundation threat for the city is not feasible or practical; therefore, all critical facilities, property, structures, and critical infrastructure within the inundation area are vulnerable.  
Based on Failure of the Jackman Coulee Dam #2:
9. An emergency action plan has been developed (2020) for the Jackman Coulee High Hazard Dam on the Tom O’Leary Golf Course. Through the breach analysis, a breach during the Inflow Design Event (0.5PMP) would result in 35 structures being impacted by flood waters.
10. Bismarck is vulnerable in the event of a catastrophic failure of the Heart Butte Dam located in Grant County as well. Based on failure of the Heart Butte Dam utilizing the Hydrologic Internal Erosion Failure scenario (worst case):
  - The Waste Water Treatment plant would have concerns for access, but is not likely to experience flood impact to the critical facilities. Other areas impacted within Bismarck would include Pioneer Park, Dakota Zoo, Riverwood Golf Course, Atkinson Park, the drainage ditch up to Washington Street, and access to the Whispering Bay development.

<b>Capabilities</b> <b>Existing Mitigation Capabilities Specific to the Dam Failure Hazard</b> <i>Also see Section 6 for additional listings of mitigation capabilities.</i>
<ol style="list-style-type: none"> <li>1. An Emergency Action Plan for Jackman Coulee Dam #2. (Tom O’Leary Golf Course) has been completed and is maintained.</li> <li>2. Maintenance activities at Jackman Coulee Dam #2 (Tom O’Leary Golf Course) as recommended by the State Water Commission and/or annual inspections conducted by Bismarck Public Works are completed.</li> <li>3. The condition rating of Jackman Coulee Dam #2 is made available publicly by the USACE via the National Inventory of Dams website (beginning February 2022). The Jackman Coulee Dam #2 rating is “Satisfactory” which is the highest rating eligible for the dam. NID website: <a href="https://nid.sec.usace.army.mil/#/">https://nid.sec.usace.army.mil/#/</a></li> <li>4. Dam owners are responsible for maintenance of their dams, so their commitment is essential to reducing the risk of dam failures. (2018 ND DES Enhanced Mitigation Plan)</li> <li>5. Pursuant to North Dakota Century Code, the North Dakota State Engineer and the North Dakota State Water Commission have the power, authority and general jurisdiction to regulate, control, and supervise the construction and operation of dams within the State of North Dakota. As such, the Dam Safety Program is administered by the North Dakota State Water Commission.</li> <li>6. The purpose of North Dakota’s Dam Safety Program is to minimize the risk to life and property associated with the potential failure of dams in the State. Functions of the Dam Safety Program include conducting dam inspections, making recommendations to dam owners regarding necessary maintenance and repairs, and maintaining an inventory of dams in North Dakota. There are currently 130 high and medium hazard dams in the State, including 24 federally owned dams. Dam Safety Program staff conduct full inspections of the 106 non-federally owned high hazard and medium hazard dams on a rotational basis. High hazard dams are currently scheduled for inspection at least once every four years. Medium hazard dams are currently scheduled for inspection at frequencies varying up to once every ten years. The Dam Safety Program is managed by the NDSWC. Source: (2018 ND DES Enhanced Mitigation Plan)</li> </ol>

7. Although North Dakota has very low risk to seismic activity, the U.S. Army Corps of Engineers has strong motion sensors installed at the Garrison Dam site near Riverdale that measure intense ground movement. There are an additional three seismic monitoring stations throughout the State. One is located south of Bismarck near Huff, another in the Red River Valley just northwest of Fargo, and the third southeast of Devils Lake near Maddock. (Source: 2018 ND DES Enhanced Mitigation Plan).
8. The US Army Corp of Engineers (USACE) maintains an extensive dam safety program to ensure the integrity of Garrison Dam. The USACE has a system of; relief wells, instrumentation (for monitoring water pressures and movement within the embankment), and a comprehensive inspection system. As part of the inspection program, the USACE conducts formal annual inspections and more comprehensive periodic inspections every five years. All of these steps are taken to help insure the integrity of the Garrison Dam to allow the USACE to continue to operate for the eight authorized purposes of; flood control, navigation, irrigation, hydropower, water supply, water quality, recreation and fish & wildlife.
9. The USACE updated the Dam Failure Inundation Map (January 2015) regarding the Garrison Dam Project. The inundation maps are made available to approved Emergency Action Plan holders.
10. The USACE has an Emergency Action Plan that would be followed in any event where the USACE's ability to operate as designed would be in jeopardy.
11. Dam Safety Program Information:  
<http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/ProgramActivities.aspx>
12. Garrison Dam and Lake Sakakawea Information:  
<http://www.nwo.usace.army.mil/Missions/DamandLakeProjects/MissouriRiverDams/Garrison.aspx>
13. The Bureau of Reclamation has updated the inundation mapping relating to the Heart Butte Dam and is in the process of updating and finalizing the Heart Butte Emergency Action Plan as of October, 2025.

# Drought

## Mitigation Actions:

1. Provide for community-wide public education relating to landscaping and watering strategies including availability of water analytics, smart irrigation controllers, drought tolerant landscaping, and irrigation rates.

*Note: In addition to local response capabilities, the existing mitigation capabilities identified within the table below adequately address vulnerabilities identified.*

## Vulnerability Summary

1. Typically, the most profound impact of drought is to the economy:
  - a. Farm and ranching community
  - b. Impact to local businesses (and employees) associated with the agricultural industry
  - c. Economically disadvantaged – increased cost of food
  - d. Tourism / recreation
2. Economically disadvantaged may be vulnerable due to the likelihood of increased cost of food during extended drought conditions regardless of geographic area impacted by severe drought conditions.
3. Heat waves associated with droughts create additional risk for vulnerable populations such as the elderly, young, and those required to work outdoors including first response community.
4. Drought increases fire risk. See Fire and Wildland Fire hazards for information regarding vulnerabilities and mitigation ideas.
5. The environment is vulnerable to drought:
  - a. Air quality
  - b. Loss of wetlands
  - c. Insect infestations
  - d. Invasive vegetative species (ie: leafy spurge)

*In the United States, a well-developed economy and agricultural system generally protect citizens from the most critical effects of drought such as shortages of food and water. However, drought still causes extreme hardship for farm and ranch families, and individual wells may run dry. Source: National Drought Mitigation Center*

## Capabilities

### Existing Mitigation Capabilities Specific to the Drought Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. The City of Bismarck water treatment plant has two water intake systems.
  - o A Horizontal Collector Well intake was placed in operation in November 2014. This water intake is 80 feet below the river’s surface and collects ground water that is recharged from the river bed. This intake has a capacity of 30 MGD (million gallons per day) and is not impacted by fluctuations in river levels or short term changes in river water quality.
  - o The surface water intake constructed in the 1950’s provides direct withdrawal of the river via four 20 inch diameter pipes. The quality and quantity of water from this intake is potentially impacted by changes in the river’s level and the migration of sandbars. This intake will be used in conjunction with the horizontal collector well intake.

2. The Bismarck Code of City Ordinances uses Chapter 2-08-03 to give the President of the Board of City Commissioners the power to issue an emergency or disaster declaration and to utilize twenty-three specific emergency powers. These powers include...
  - Require the continuation, termination, disconnection, limitation, or suspension of natural gas, electrical power, water, sewer, or other public utilities or services.
  - Control, restrict, allocate, or regulate the use, sale, production, or distribution of food, water, fuel, clothing, and/or other commodities, materials, goods, services, and resources.

<h1>Fire</h1>
<b>Mitigation Actions</b>
<ol style="list-style-type: none"> <li>1. Continue to update and enforce zoning, building and fire code regulations.</li> <li>2. Promote (not require) residential fire sprinkler systems to minimize fire risk and vulnerability.</li> </ol>
Public Education topics:
<ol style="list-style-type: none"> <li>3. Continue to provide Fire Safety public education to enhance safety for the whole community.</li> </ol>
<b>Vulnerability Summary</b>
<i>Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.</i>
<ol style="list-style-type: none"> <li>1. Occupancies that do not have working smoke detectors are at risk. Statistics indicate a higher fatality rate in fires that occur in occupancies without working smoke detectors.</li> <li>2. Non-sprinklered property is at a higher risk of sustaining more damage or life loss compared to property that is protected by sprinkler systems.</li> <li>3. The young (ie: Daycare) and elderly population is more vulnerable for several reasons. Age, mental state and physical limitations may make it difficult to evacuate a building involved in fire or they can become confused and not be able to take the correct actions. Many daycares and schools do not have fire sprinkler systems.</li> <li>4. Some mobile homes are vulnerable due to their construction materials and close proximity to each other.</li> <li>5. Apartment houses without sprinkler systems or working alarm systems are also at higher risk.</li> </ol>

<b>Capabilities</b>
<b>Existing Mitigation Capabilities Specific to the Fire Hazard</b>
<i>Also see Section 6 for additional listings of mitigation capabilities.</i>
<ol style="list-style-type: none"> <li>1. The Bismarck Fire Department has an ISO rating of 1. It is a continued goal of the Bismarck Fire Department to maintain the Class 1 rating to enhance public safety, reduce insurance costs, and demonstrate continued excellence in fire service delivery.</li> <li>2. Fire stations are strategically located throughout the city for optimum response times.</li> <li>3. All fire stations are adequately staffed to provide response capability for fires that may range from a single-family dwelling to a large commercial property.</li> <li>4. The Fire Department has capabilities to analyze the need for additional fire stations as the city grows. The analysis/need is based on maintaining response times and other factors which support the ISO rating.</li> <li>5. The city has a modern dispatch center with many capabilities.</li> <li>6. Fire hydrants are spaced throughout the city for uniform coverage.</li> <li>7. Fire hydrants are flow tested to assure adequate water supply. Water Modeling is used to provide a more current and comprehensive assessment of the water supply.</li> <li>8. A fire inspection program is in place. All commercial properties and larger multi-family residential rental properties are inspected annually to identify and reduce fire hazards.</li> <li>9. Fire and Building codes have been adopted to ensure fire and life safety requirements are met for new and existing buildings. The following codes are currently enforced by the City of Bismarck, Fire Department: <ul style="list-style-type: none"> <li>• International Building Code – 2021</li> <li>• International Fire Code - 2021</li> <li>• International Residential Code - 2021</li> <li>• International Mechanical Code - 2021</li> <li>• International Fuel Gas Code - 2021</li> </ul> </li> </ol>

- North Dakota State Plumbing Code - 2018
  - National Electrical Code - 2023
  - Laws, Rules, and Wiring Standards of North Dakota - 2023
  - NFPA 13 Installation of Sprinkler Systems - 2019
  - NFPA 13R Installation of Sprinkler Systems in Residential Occupancies up to and including 4-stories in height - 2019
  - NFPA 14 Installation of Standpipe Systems - 2019
  - NFPA 72 National Fire Alarm Code - 2019
10. Sprinkler requirements are in place to increase the level of life safety in certain buildings as well as to control fires that do occur.
  11. Zoning and other regulations are in place to reduce the risk of fire exposure through orderly development of the community.
  12. A permitting process is in place for suppression systems, alarm systems, fireworks displays and building construction.
  13. Public education programs are provided to the youth in the school system.

# Flood

## Mitigation Actions

1. Bismarck is currently rated at Class 7 within the Community Rating System. Continue annual re-certifications to sustain the CRS program.
2. Continue Watershed master planning and updating as an on-going mitigation activity conducted jointly by Engineering, Public Works, Planning, and Building Inspections.
3. Maintain existing flood protective measures to minimize vulnerability as a result of ice jams as well as 100-year and 500-year flood events. Note: Refers to maps (Figures 1 thru 7) within "Capabilities" on pages 4-10/
4. South Bismarck Flood Control Mitigation Project: Reconstruct the South Washington Street Closure Structure (gate) and add a pump station at this location. This will create FEMA-certified flood protection at the south Bismarck drainage ditch and the South Washington street closure structure.
  - a. And modify (widen) the drainage ditch in south Bismarck to enhance flood control and to assist in meeting FEMA requirements for flood protection certification.

*Note: The flood insurance risk map will be revised after construction is completed. After the map update, many of the 950 structures that are currently identified in the effective map will be removed from the Missouri River flood risk. The current effective flood map was updated in June of 2024.*

### Public Education Topics:

5. Coordinate and/or support NFIP flood insurance promotional efforts including the availability of flood insurance for community residents and businesses.
6. Provide for Flood Mitigation and Preparedness Public Education efforts for local citizens and businesses (via website content and public presentations upon request).

## Vulnerability Summary

*Refer to the "Vulnerability Assessment" table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. Although flood protective measures including levee structures are in place to protect south Bismarck, those protective measures are not certified by FEMA. There are also required response actions to fill gaps. Properties, population, and infrastructure within the 100 Year and 500 Year flood plains remain vulnerable to those flood events.
2. Vehicles and occupants may inadvertently enter a flooded underpass at the 7<sup>th</sup> Street or 9<sup>th</sup> Street location following an urban flooding event. There is pumping capability at the 7<sup>th</sup> Street underpass location (replaced in 2019). The 9<sup>th</sup> street location is drained via gravity flow.
3. Vulnerabilities regarding lack of access following an urban ponding event include:
  - Airport and Skyway Village
  - 12<sup>th</sup> Street (from University Drive to Bismarck Expressway)
  - Bismarck Expressway from 7<sup>th</sup> to 12<sup>th</sup> Street
  - South 3<sup>rd</sup> Street – from Arbor Avenue to Bismarck Expressway
  - Broadway Avenue – from 12<sup>th</sup> to 14<sup>th</sup> Street
  - Washington Street and Bowen Avenue
  - 2<sup>nd</sup> Street and Arbor Avenue
4. The South Fire Station is vulnerable to urban flooding (street access).
5. Stormwater management infrastructure may be impacted by more frequent heavy rain events as a result of climate change impacts.

## Capabilities

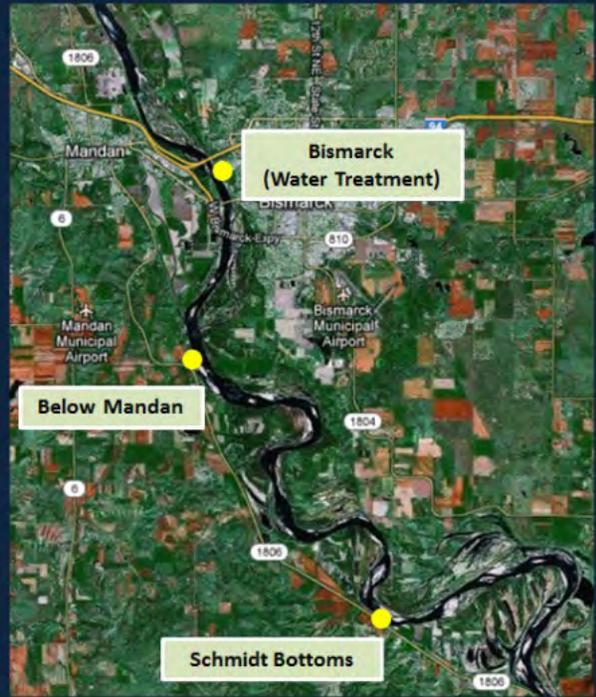
### Existing Mitigation Capabilities Specific to the Flood Hazard

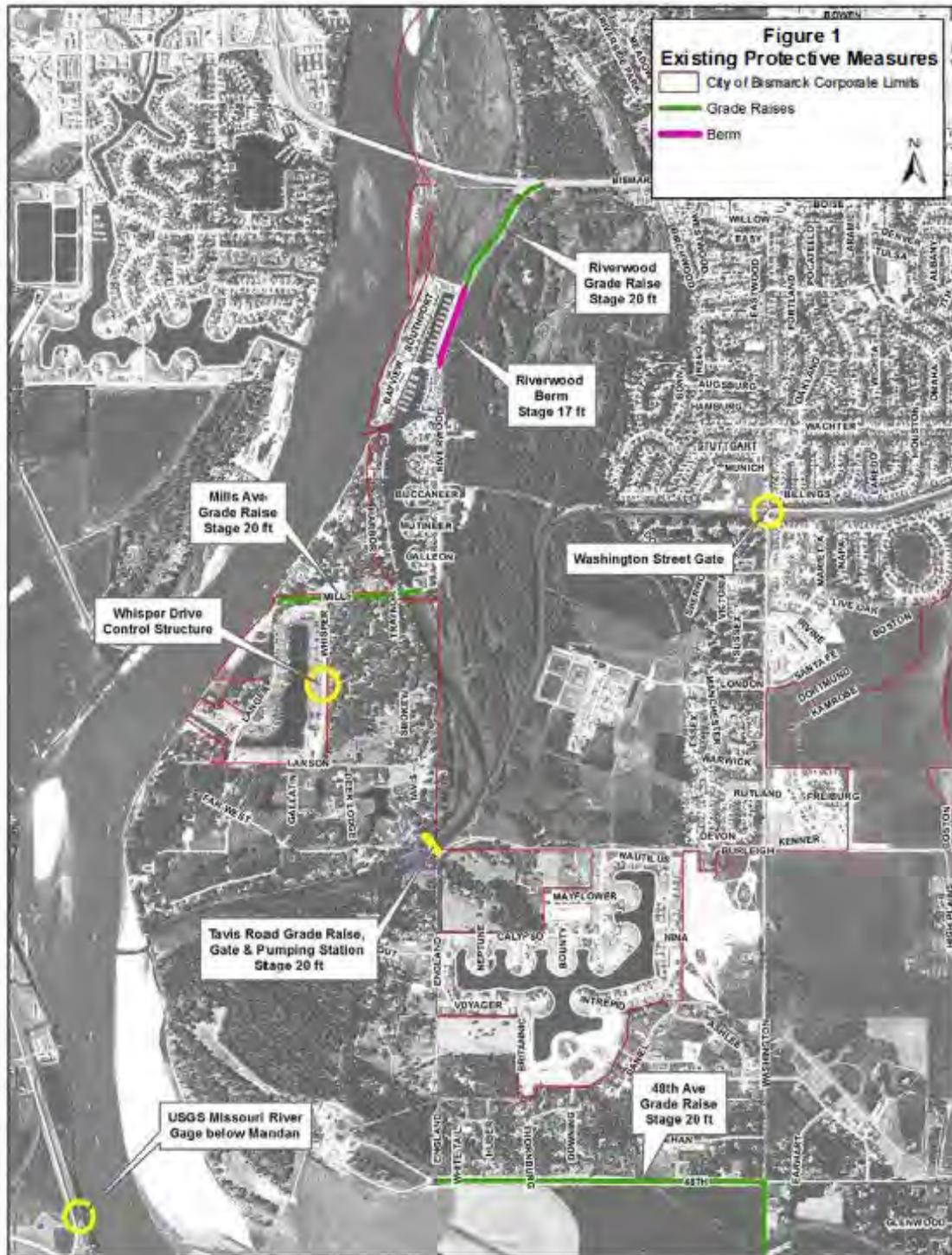
*Also see Section 6 for additional listings of mitigation capabilities.*

1. As of October 2025, a Wastewater Treatment Plan Flood Protection system was completed. Control structures were placed along the wastewater treatment plant outfall near the Tavis structure and the river to protect the wastewater treatment plant from inundation when river levels at Bismarck gage station rise to 13'.
2. The Tavis Road flood gate control structure and pumping station have been installed and are operational. Closing the flood gate control structure prevents flood waters from back-flowing into and elevating the drainage ditch level. Additionally, the pumping station establishes the capability of reducing the drainage ditch level to maximize its storage capacity and minimize the potential for flash flood impacts.
3. The grade of Tavis Road has been raised to a flood stage of 20 feet.
4. Following the 2011 flood event, the City of Bismarck installed flood gates on stormwater outfalls. See letter "C" on Figure 5 map.
5. The pumping capability at #8 is permanent. The other locations require response action to set up temporary pumping. See applicable map - Figure 5.
6. Additional ice jam protection measures were installed in 2012 by Burleigh County.
7. In 2013, the City of Bismarck completed the Riverwood Drive and Mills Ave reconstruction projects. These projects included grade raises of the existing roadways to a flood stage of 20-feet. Riverwood Drive was completed from Expressway Ave to the north entrance of Southport Loop. The grade raise portion of Mills Avenue was completed and paved in 2014. The project included several control structures with sluice gates located on the storm water outfalls and a control structure on the Mills Avenue causeway. The new sluice gates and control structure are operation and ready to be manually closed during a flood event.
8. Burleigh County completed a grade raise project in the Fox Island area which protects Bismarck from flooding. The grade raise extends from Tavis Road to Far West Drive to Gallatin Dr to Gallatin Loop, Gallatin Loop to offroad to Missouri River bank, north to Whisper Bay channel to Whisper Bay bridge. See "#21 Levee Construction"

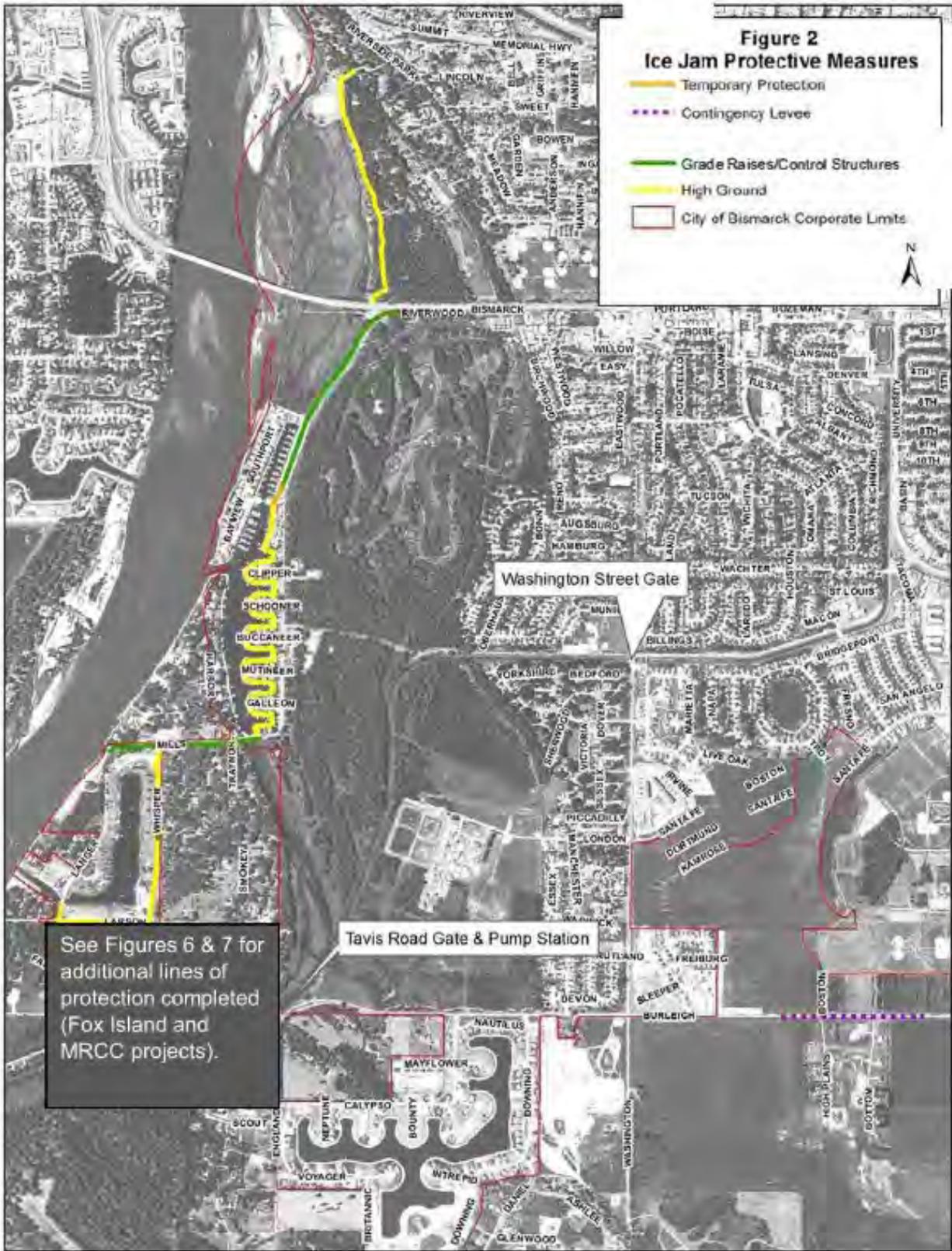


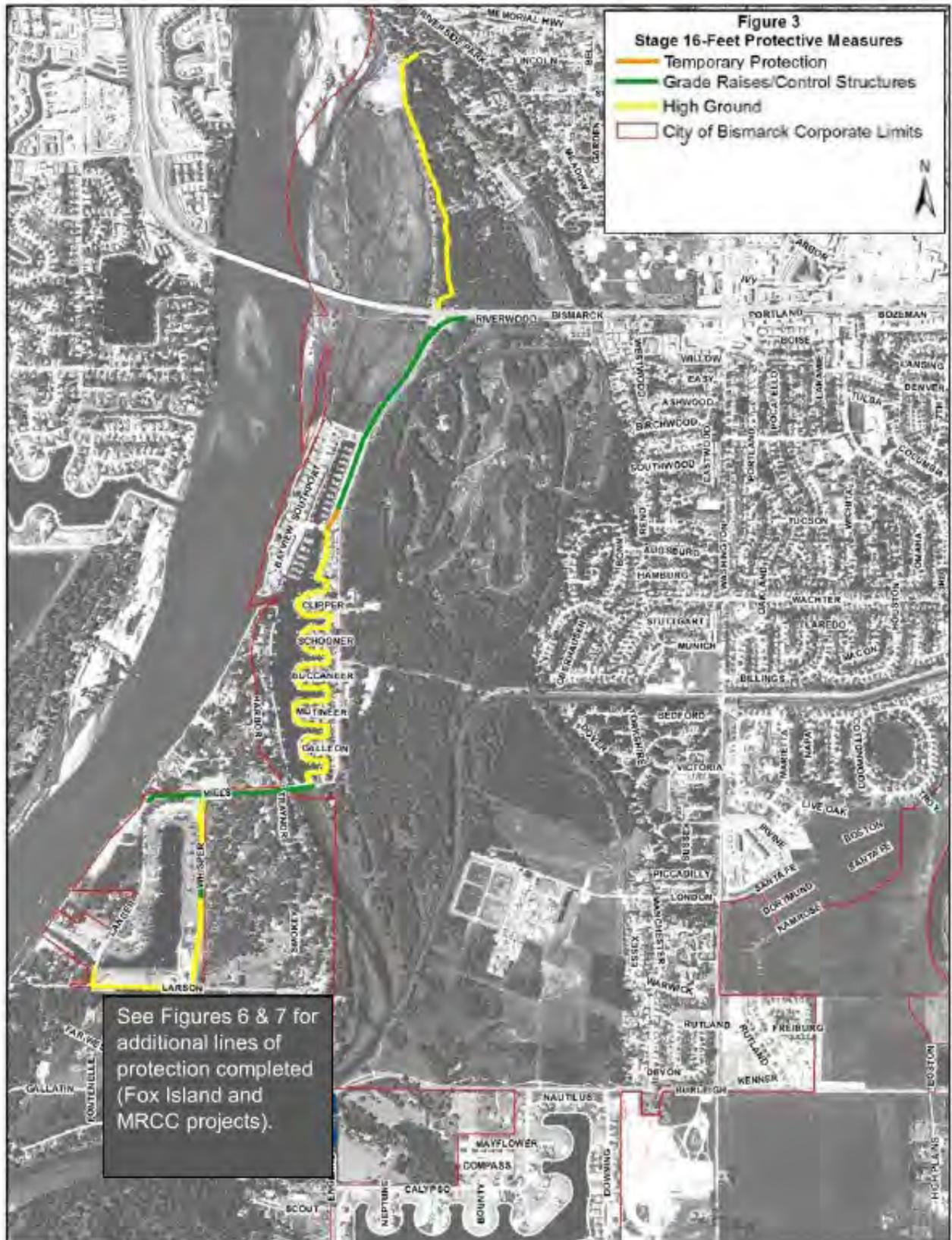
9. See also figures 1 through 7 on pages 4-10 for diagrams of existing flood protection.

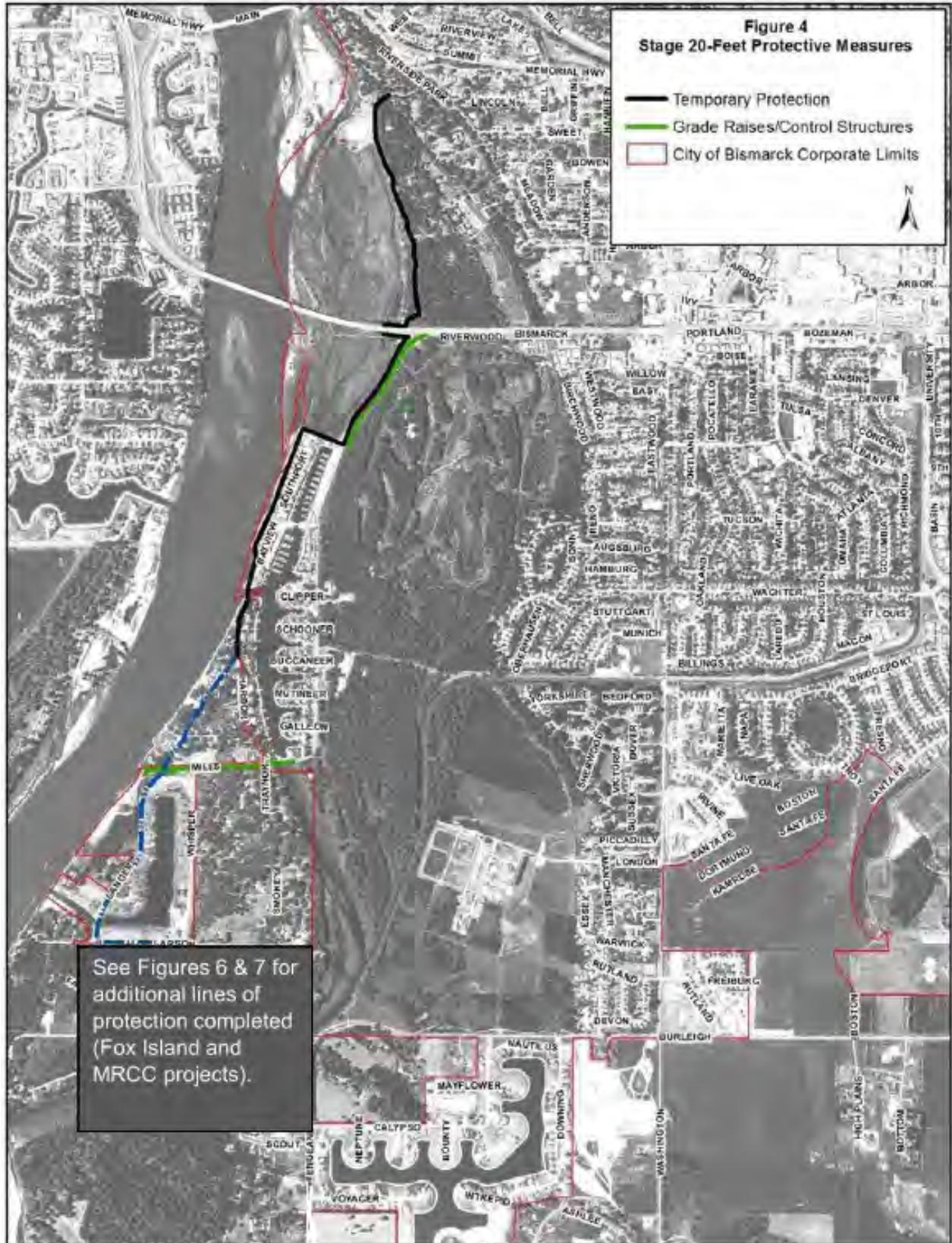
<p>River Gage Locations: See map on right.</p> <p>10. A river gaging station has been installed by the USGS to collect river elevation data for both open water and ice covered periods on the Missouri River. The USGS installed the stage gage near Fort Lincoln on the west side of the river: <a href="#">USGS 06349070, Missouri River below Mandan, ND</a>. This gage will provide timely stage information for South Bismarck.</p>	
<p>Open Space Deed Restrictions in place:</p>	<ol style="list-style-type: none"> <li>1. Lot Twenty Four (24), Block Tweny Nine (29), Stein’s Fourth Addition to the City of Bismarck. This property was sold to the City of Bismarck in 2002, and must remain compliant with open space regulations in perpetuity.</li> </ol>



See Figures 6 & 7 for additional lines of protection completed (Fox Island and MRCC projects).







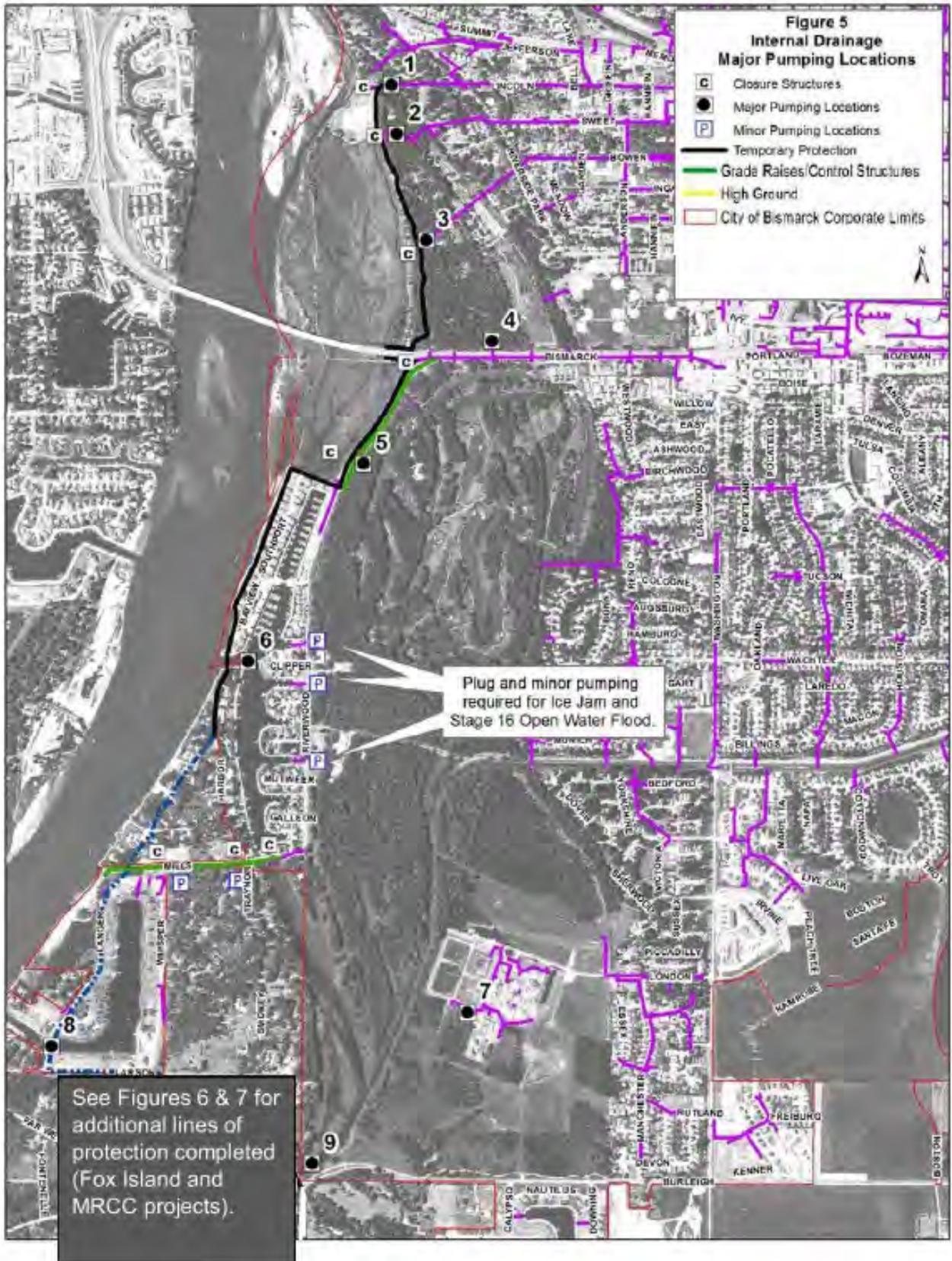


Figure 6

Stage 20 feet Flood Protective Measures  
Fox Island Project Location

<https://www.bcwrdd.org/image/cache/6 - Fox Island Flood Control BCWRD - O M FINAL 4-14-2021.pdf>



Figure 7

Stage 20 feet Flood Protective Measures  
MRCC Project Location

<https://www.bcwr.org/image/cache/5 - MRCC Flood Control Project - O M Manual 2-19-18.pdf>



### Capabilities, continued

11. Flood Insurance Study: The special flood hazard areas are identified by the Federal Emergency Management Agency (FEMA) in a scientific and engineering report titled "The Flood Insurance Study for Burleigh County, North Dakota and Incorporated Areas", Revised August 6, 2024. Flood Insurance Study and Flood Insurance Rate Maps are available via FEMA: <https://msc.fema.gov/portal/home>
12. The Bismarck 100-Year (Special Flood Hazard Area) Flood Insurance Rate Maps is updated as of June 6, 2024.
13. Bismarck is a participating community in the National Flood Insurance Program. (CID#380149). Participation in the NFIP requires communities to adopt floodplain regulations that meet NFIP objectives, which are: New buildings must be protected from flooding damages that occur as a result of the 100-year flood, and new development must not cause an increase in flood damages to other property.
14. Bismarck became a Community Rating System (CRS) community in 2017, entering the program with a Class 8 rating and upgraded to a Class 7 in 2022. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions that meet the goals of the CRS program.
15. **Floodplain Ordinance:** The floodplain ordinance is contained with the Bismarck Zoning Ordinance – Title 14. The purpose of the regulations set forth by the floodplain ordinance (14-04-19) is to promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions. A “Floodplain Administrator” is designated by the City of Bismarck to administer the City’s floodplain regulations. More information: <http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962>
16. Floodplain management is addressed through our Floodplain Administrator and Community Development via regular planning meetings where storm water management and floodplain issues are addressed.
17. Bismarck’s Comprehensive Plan entitled “Together 2045” identifies goals and objectives relating to stormwater management as well as goals and objectives to build community resilience to prepare for, respond to, withstand, and recover from natural disasters.
18. **Stormwater Management Program – Mitigation Capabilities:** Bismarck has a Stormwater Management Program implemented jointly by Community Development, Engineering, and Public Works and a Stormwater Program Coordinator within the Public Works Department. Mitigation capabilities of the Stormwater Management program are identified through Community Development via City Ordinance Title 14.1 (Zoning Ordinance). The city has authority to regulate and enforce stormwater management requirements to promote health, safety, and welfare of the people and property within Bismarck and its extraterritorial jurisdiction. The requirements, permitting and detailed review process are in place to mitigate the impacts of development and land disturbance, protect natural resources, maintain water quality, and minimize stormwater runoff, erosion, and urban flooding issues. More Information: <https://www.bismarcknd.gov/190/Stormwater>
19. The National Weather Service issues warnings, watches, and advisories for flooding.

Additional completed and on-going flood mitigation (existing mitigation capabilities).

20. Apex Engineering completed a study to identify solutions to reduce urban ponding in south Bismarck in the Expressway and South 12<sup>th</sup> Street area. Identified actions have been completed.

21. The 7<sup>th</sup> Street underpasses has permanent pumping capability to address urban flooding events. The pump was replaced in 2019. The 9<sup>th</sup> Street location relies on gravity flow.

22. Commitment to Stormwater Management:

Throughout its existence Bismarck has devoted considerable resources to ensuring the safe and adequate discharge of stormwater within the community.

A number of diversified watersheds within and adjacent to our city, such as the Apple Creek watershed, the Hay Creek watershed, the Jackman Coulee watershed, and the Tyler Coulee watershed, has resulted in the need for a proper stormwater management planning to minimize the potential for damages to already developed downstream properties as development and growth continued. Early solutions to stormwater issues tended to deal mainly with accommodating runoff volume and provided little else as far as erosion control or water quality. Stream channelization was viewed as an acceptable solution. For a more complete listing of the stormwater projects completed in Bismarck over the years, please consult the City of Bismarck Stormwater Management Plan, dated April 1, 1997.

Since the passage and adoption of the City of Bismarck Stormwater Management Ordinance in 1997 with an implementation date of January 1, 1998 (updated and effective January 1, 2018), increased emphasis has been placed on requiring developers to properly control stormwater runoff from their property so that post development runoff is equal to, or less than, predevelopment runoff. This has typically been accomplished through an extensive network of detention ponds, some of a local nature meaning the pond detains runoff from a limited area, and some of a regional nature where the pond collects runoff from a larger area involving multiple property owners and neighborhoods.

Working collectively with developers and grant monies obtained from federal, state, and local sources, recent projects have resulted in stormwater systems that more closely resemble natural stream streambeds and ponds. Recreational trails have been constructed adjacent to and within some stormwater areas. For example, the restoration of the Hay Creek Greenway, complete with a shared use path, now serves as an asset to our community and has generated appreciative comments from our citizens.

Stormwater management, both nationwide and in Bismarck, is a much more complex matter than it was even a half century ago. Through continued proper planning, design, construction, operation and maintenance, our stormwater resources can provide safe, reliable protection for our community and residents for years to come.

## National Flood Insurance Program Compliance (NFIP Compliance)

Bismarck is a participating community in the National Flood Insurance Program. (CID#380149). Participation in the NFIP requires communities to adopt floodplain regulations that meet NFIP objectives, which are: New buildings must be protected from flooding damages that occur as a result of the 100-year flood, and new development must not cause an increase in flood damages to other property.

Bismarck has procedures implemented to address and maintain NFIP compliance.

1. A floodplain ordinance has been adopted and remains in effect. The floodplain ordinance is contained with the Bismarck Zoning Ordinance – Title 14. The purpose of the regulations set forth by the floodplain ordinance (14-04-19) is to promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions. A “Floodplain Administrator” is designated by the City of Bismarck to administer the City’s floodplain regulations.  
More information: <http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962>  
See ordinance – next page.
2. Residents are provided information on flood hazards, floodplain map data, and availability of flood insurance.
3. An interactive floodplain map is available on the city’s website: <https://arcg.is/1zqDTHO>
4. Floodplain management is addressed through our Floodplain Administrator and Community Development via regular planning meetings where storm water management and floodplain issues are addressed.
5. Mitigation Actions highlighted below illustrate commitment to maintain NFIP compliance. These mitigation actions are also identified in Section 4: Mitigation Implementation Action Plan.
  - Apply to participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS).
  - Coordinate and/or support NFIP flood insurance promotional efforts including the availability of flood insurance for community residents and businesses.
  - Conduct Flood Mitigation and Preparedness Public Education efforts for local citizens and businesses.
6. Additional actions supporting NFIP compliance are noted in within this plan section (ie: Flood Hazard mitigation actions and pre-existing mitigation)

### National Flood Insurance Program (NFIP)

The Federal Disaster Protection Act of 1973 requires state and local governments to participate in the NFIP as a condition to the receipt of any federal loan or grant for construction projects in flood prone areas. Participation in the NFIP requires communities to adopt floodplain regulations that meet NFIP objectives. The first objective is that new buildings must be protected at a 100-year flood level. The second objective is that new development must not cause an increase in flood damage to other property. In 2012, the Biggert-Waters Reform Act was signed and contains many reforms that will impact the NFIP moving forward. These changes include the phasing out of subsidies, new insurance policies to be issued at full-risk rates, and grandfathered rates being phased out over five years.

Communities have been provided assistance through the North Dakota Floodplain Management Act of 1981 which directs the state engineer to aid local governments in reducing flood damages through sound floodplain management. The state legislature provided the state engineer with an appropriation to be used in assisting communities to obtain base flood (100-year) elevation data.

## Floodplain Ordinance

### NFIP Compliance Continued

**Floodplain Ordinance:** <http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962>

14-04-19. FP Floodplain District. In any FP floodplain district, the following regulations shall apply:

1. Statement of purpose. It is the purpose of this section to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- a. To protect human life and health;
- b. To minimize expenditure of public money for costly flood control projects;
- c. To minimize the need for rescue and relief efforts associated with flooding, generally undertaken at the expense of the general public;
- d. To minimize prolonged business interruptions;
- e. To minimize damage to public facilities and utilities located in special flood hazard areas such as water and gas mains, electric, telephone, and sewer lines, streets, and bridges;
- f. To help maintain a stable tax base by providing for the use and development of special flood hazard areas so as to minimize future flood blight areas;
- g. To ensure that potential buyers are notified that property is located in a special flood hazard area;
- h. To ensure that those who occupy the special flood hazard areas assume responsibility for their actions; and
- i. To provide an increased level of protection in anticipation of future increases in the base flood elevation (BFE).

2. Methods of reducing flood losses. In order to accomplish its purposes, this section includes methods and provisions for:

- a. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion, flood water elevations or flow velocities;
- b. Requiring that uses vulnerable to flooding, including attendant utilities and facilities which serve such uses, be protected against flood damage at the time of initial construction;
- c. Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or convey flood waters;
- d. Controlling filling, grading, dredging, and other development which may increase flood damage; and
- e. Preventing or regulating the construction of flood barriers or obstructions which will unnaturally divert flood waters or which may increase flood hazards in other areas.

# Geologic Hazard

## Mitigation Actions

1. Continue to include recommendations regarding development control lines in geological sensitive areas as future planning is done.

### Public Education topics:

2. Identify opportunities to inform or remind property owners of property related information regarding potential geologic conditions that may impact them or their property.
3. Do Not stockpile snow or other material within any geological sensitive areas.

## Vulnerability Summary

*Refer to the "Vulnerability Assessment" table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. The properties along Burnt Boat Drive are built on backfill. Backfill is more prone to failure or settling if not compacted properly. Numerous properties in northwest Bismarck were constructed on extensive backfill along steep topography.
2. The DMVW railroad tracks run adjacent to Hay Creek through much of Bismarck. Hay Creek crosses under the tracks at five locations between 57<sup>th</sup> Street and Divide Avenue. The DMVW tracks run adjacent to Hay Creek for a distance of approximately 25,000 feet (4.7 miles) through Bismarck. The vulnerability of concern is the potential washout of the track bed and stability of the slope adjacent to the tracks.
3. Burnt Boat Drive is vulnerable (potential loss of street) based on adjacent slopes. Burnt Boat Drive provides critical access to residential properties and to River Road in north Bismarck.
4. Land disturbance control lines were established for the Promontory Point developments and other areas surrounding the Tyler Coulee. Promontory Points I, II and III had no land disturbance control lines when they were developed. The platting of Promontory Point IV established a 50 ft development control line for those lots adjacent to the bluff, but there wasn't a geotechnical determination to support this requirement.
5. The platting of the bluffs adjacent to Hay Creek, such as the Pebble Creek Developments and the Edgewood Developments, did not establish any land disturbance control lines.
6. River Road from Highway 1804 to Fraine Barracks is vulnerable due to the adjacent bluffs / slopes.
7. Property owners may not be aware of easements and setback requirements or other property geologic issues. Lack of awareness may potentially cause problems as a result of over-watering or overloading unstable areas.
8. As the community grows, new areas of development run the risk of increased property vulnerability to the geologic hazard of expansive soils.
9. Underground infrastructure (water, wastewater, pipeline) is vulnerable to both landslide and the expansive soil geological hazards.
10. The transportation infrastructure (ie: streets, sidewalks, and bridges) is vulnerable to the impacts of expansive soils.

## Capabilities

### Existing Mitigation Capabilities Specific to the Geologic Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. Remediation activity to buttress the active geologic slide along River Road north of I-94 Grant Marsh Bridge has been completed.
2. The city has updated the Ash and Ward Coulee Storm Water Master Plan in 2025.
3. Tyler Coulee Storm Water Master Plan prepared in 2002 and updated in 2007 established setback lines to limit development in areas with steep slopes.
4. Completed Tyler Coulee Storm Water project, consisting of new regional stormwater detention facilities, road embankments and storm crossings, and improvements to the existing channel conveyance within the Tyler Coulee drainageway.
5. A report entitled “Geologic and Hydrogeologic Conditions Affecting Land Use in the Bismarck-Mandan Area” via Department of Mineral Resources ND Geologic Survey includes maps intended to provide geologic and hydrogeologic technical input as an aid to future planning.  
[https://www.dmr.nd.gov/ndgs/documents/Publication\\_List/pdf/RISeries/RI-70.pdf](https://www.dmr.nd.gov/ndgs/documents/Publication_List/pdf/RISeries/RI-70.pdf)
6. Bismarck’s “2014 Growth Management Plan as Amended” includes a Future Land Use Plan (FLUP) which illustrates the anticipated and desirable land uses in the potential growth areas of the city. One of the assumptions in developing the concept is that “Streams, slopes, and other significant constraining factors are left as open space, although they may be incorporated as open space owned by public entities or within private development.”
7. Future capability: The ND Geologic Survey Department is planning to integrate a new technology into its program that has potential for local applications such as routine monitoring of slope stability, land surface subsidence, flood tracking, or even delineating areas affected by fires and tornadoes. The recently launched NISAR Mission is a collaborative effort of the National Aeronautics and Space Administration (NASA) and the Indian Space Research Organization (ISRO). NISAR is equipped with synthetic aperture radar (SAR) instrumentation, a type of active remote sensing that functions by emitting radar pulses and recording the reflected signal.

# Hazardous Materials Release

See Also “Train Derailment”

## Mitigation Actions

1. Develop preplans specific to hazardous materials fixed facilities.

Public Education topics:

2. Continue Public Education efforts regarding Shelter In Place and Evacuation procedures.

## Vulnerability Summary

*Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. Hospital locations: Both are in close proximity to truck routes (hazmat trucks). Both hospitals could potentially be impacted as a result of an incident because of hospital proximity to each other.
2. Critical facilities in close proximity (< ¼ mile) to pipeline, truck route, or fixed facilities include Public Works, Police Department, South Fire Station, Sanford Health, CHI St. Alexis Health, Fraine Barracks, Metro Area Ambulance South, State Penitentiary, Burleigh Morton Detention Center, and Public Health.
3. The Water Treatment plant and Wastewater treatment plant are critical facilities which must utilize hazardous materials (ie: chlorine). The WTP is near the ND Department of Emergency Services and National Guard facilities within Fraine Barracks (critical facilities).
4. There are eighteen schools and daycares in close proximity (< ¼ mile) to truck (hazmat) routes. Impact to more than one school based on any transportation incident is not likely.
5. A low income extended stay motel is located across the street from Ferrelgas (Bismarck Motor Motel).
6. Vulnerable Populations in close proximity to the WBI natural gas pipeline in NW Bismarck include Bismarck State College, Centennial Elementary, Horizon Middle School, Pinehurst Shopping Center, Touchmark Assisted Living, Horizon Care Home, and Primrose Assisted Living.
7. Vulnerable populations adjacent to truck (hazmat) routes include Primrose Assisted Living, Maple View and Kirkwood Mall. Numerous churches are adjacent to designated truck routes as well.
8. Montessori Daycare is adjacent to I-94. This may be perhaps the most vulnerable special population along I-94 should an incident occur near that location or directly impact that location. The daycare is approximately 200 feet from the interstate. The slope from the interstate to Montessori school is relatively steep. One factor reducing the likelihood of an incident at this location is the fact there is no curvature to I-94 at this location or in the general approach of this location.
9. Especially within the winter months due to the prevailing winds, portions of Bismarck are downwind from the Marathon Refinery.
10. Individuals, including the homeless population, without immediate access to transportation resources (inability to evacuate).
11. Homeless population with limited or no building access to shelter in place.

## Capabilities

### Existing Mitigation Capabilities Specific to the Hazards Materials Release Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. Inspections of all Fixed Facilities are conducted by the Bismarck Fire Department.
2. Zoning: Title 14 (14-03-08) identifies permitted zoning areas (industrial and agricultural) for special use bulk storage plants with the purpose of storage and distribution of flammable, combustible, or hazardous materials and identifies installation requirements to limit impact to waterways, drainage ways, and residential areas.
3. International Fire Code is adopted by Bismarck. Mitigation examples of the code include:
  - Regulations regarding quantity and type of materials stored.
  - Separation of incompatible materials is required.
  - Multiple control areas must be established in some cases based on quantity and type of material.
  - Suppression systems must be in place.
4. The City of Bismarck (ie: Fire Department) is aware of hazardous materials used and stored within Bismarck:
  - Tier II Reports are submitted to Bismarck Fire by local facilities (requirement).
  - Railroad hazmat shipments are shared by the railroad industry
  - 2012 Burleigh County Hazmat Flow Study identifies hazardous materials transported through the community. The flow study was conducted to assist in emergency planning. This study may be updated as needed via the Local Emergency Planning Committee (LEPC).
  - Crews document hazardous materials within RMS (including non-reportable quantities) Data within RMS includes documenting the location or storage area within the facility
  - Hazardous Materials facilities are mapped via Bismarck GIS division for planning and response purposes.
5. Bismarck has a year-round household hazardous waste and electronics recycling program via the Public Works Department.
6. The Bismarck Water and Wastewater Treatment Plants have both developed and implemented Risk Management Plans as required by Federal Regulations (Chemical Accident Prevention Rule under the Clean Air Act). These plans cover risk assessment, chemical handling and operating procedures, training, equipment inspection and maintenance, and emergency response procedures. The Plans also include periodic audits.
7. Bismarck Fire Department firefighters are trained to the hazmat technical level.
8. The Bismarck Fire Department and the National Weather Service both have plume modeling capability.
9. Bismarck Fire Department has strong working relationships with ND National Guard Civil Support Team, ND regional response partners, and mutual aid with neighboring jurisdictions.
10. Bismarck Fire and Emergency Management conduct on-going public education to promote “shelter-in place” and evacuation planning.
11. Shelter-In-Place public education remains on the city’s emergency management website.

# Infectious Disease

## Mitigation Actions

1. Continue Existing Mitigation Efforts (See Mitigation Capabilities listed on next page).
2. Community education campaigns are elevated during increased risk of disease. (influenza season)
3. Engage Community partners during disease outbreaks.

## Vulnerability Summary

*Refer to the "Vulnerability Assessment" table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. If other areas of the North Dakota (or neighboring states) are impacted, our medical facilities could be overwhelmed due to demands placed on our facilities. *The same facilities would be overwhelmed by a locally affected population as well.*
2. Although all people are vulnerable, the elderly population and the population with underlying medical conditions or suppressed immune systems are more vulnerable.
3. North Dakota allows for opting out of vaccines for religious, moral, or philosophical reasons.
4. Common social practices such as community cup or exchange of peace at area churches (and regionally) enhance the vulnerability to Infectious diseases.
5. Bismarck has many facilities and other venues that are primarily an asset to the community, but also create vulnerability to the spread of Infectious disease within our community:
  - a. Bismarck Airport
  - b. Bismarck Civic Center
  - c. MDU Community Bowl at BSC
  - d. Schools
  - e. Shopping Centers
  - f. Churches
  - g. Long term care centers
  - h. Hospitals
6. Jurisdictions with the higher populations are at greatest risk from Infectious diseases. Bismarck is the 2<sup>nd</sup> most populated community in ND.
7. Universities located in Bismarck are particularly vulnerable as their student populations often live and study in close quarters, thus heightening the probability of transmission.
8. Almost any highly contagious, incapacitating disease that enters the North Dakota population would quickly overwhelm local and state health resources. Similarly, any rapidly spreading bioterrorism event for which little vaccination or containment capability exists is a high magnitude event.
9. Infectious diseases are most likely to spread quickly in institutional settings such as dormitories, long-term care facilities, day care facilities, schools, correctional institutions, etc.
10. Those in who live or work in close proximity – within institutional settings are at higher risk.
  - a. Our cold winter season promotes vulnerability as people spend more time indoors. In some cases, heating systems may promote the circulation of contaminants.
11. Not all parents choose to vaccinate their children. Consequently, parents who don't vaccinate their children are in essence depending on the vaccination of other children to protect their child from getting vaccine preventable diseases.
12. The uninsured population is more vulnerable to diseases due to potential lack of healthcare.
13. Bismarck, including the Bismarck Airport, does not have authority to quarantine without sufficient supporting information.
14. Foodborne illnesses have the greatest impact on the young, elderly and people who may be immune-compromised or have other existing health conditions.

15. Anyone who swims in man-made or natural bodies of water is susceptible to recreational water illness.
16. Anyone living in an area where West Nile virus is present in mosquitoes can get infected. West Nile virus has been detected in all lower 48 states (not in Hawaii or Alaska). The risk of infection is highest for people who work outside or participate in outdoor activities because of greater exposure to mosquitoes. People with certain medical conditions, such as cancer, diabetes, hypertension and kidney disease are also at greater risk for serious illness.

## **Capabilities**

### **Existing Mitigation Capabilities Specific to the Infectious Disease Hazard**

*Also see Section 6 for additional listings of mitigation capabilities.*

1. Drive-thru vaccination and/or dispensing capability is established at the new Public Health facility (heated area).
2. Sterilization of foot care equipment with an autoclave to decrease spread of Infectious disease.
3. Identify appropriate locations for isolation or quarantine.
4. Increase Immunizations rates through grants opportunities and QI projects.  
Provide breastfeeding education to increase breastfeeding in the community for higher rates of baby immunity.
5. Provide Narcan training opportunities to the community to help with the emerging substance abuse threat.
6. Ongoing education of staff for better response to an outbreak.
7. Provide website and social media means to educate the public during an event.
8. Engage and support local healthcare providers in an active preparedness coalition.
9. Provide education when conducting food service inspections.
10. Provide mosquito control & surveillance services.
11. Hand-sanitizers and masks are available to clients to prevent spread of disease.
12. Medical assets exist to appropriately respond. NDHHS and its medical partners have most of the anticipated materials needed for biological response. These materials are stored in a warehouse supported by an internal transportation which can be supplemented by contract or by assistance request to DES. Some materials are pre-deployed around the state and additionally local public health units have medical assets stored in their health units.
13. Annual flu clinics are held at the BBPH Office.
14. Immunization clinics are held at BBPH Office.
15. N95 fit-testing is completed for nursing staff at local public health units, as well as for long-term care facilities.
16. Bismarck/Burleigh Public Health maintains emergency preparedness plans and conducts training and exercising of those plans.
17. The USPS has a bio-detection system in place at the sorting facility to detect anthrax.
18. It is required to inform the ND Health and Human Services regarding incidence of reportable diseases per statutory authority NDCC 23-07-01. Reportable disease are listed at <https://www.hhs.nd.gov/health/diseases-conditions-and-immunization/STI/report>
19. Bismarck Environmental Health conducts risk-based inspections on all food establishments annually (one inspection minimum) to verify compliance with the food code.
20. The ND Health and Human Services (NDHHS), Division of Disease Control monitors and investigates Foodborne illnesses.
21. Diagnosed foodborne illness is mandatory reporting to the NDHHS.
22. Food employees who are symptomatic with vomiting or diarrhea must be excluded from work until they are asymptomatic for 24 hours.
23. All public and semi-public pools are inspected annually by Bismarck's Environmental Health

Division.

24. All public and semi-public pools are tested once a month for bacteriological analysis.
25. All public and semi-public pools are required to have a pool operator that is certified by the National Swimming Pool Foundation.
26. The North Dakota Department of Health (NDHHS), Division of Disease Control monitors and investigates all Recreational Water Illnesses.
27. Bismarck currently has a vector control program that performs mosquito surveillance, educates residents on how to avoid getting bitten by mosquitoes, fogs public parks and walking paths and treats standing water with larvacide.
28. Environmental Health enforces environmental health codes and conducts public education to prevent or mitigate health impacts related to sanitation, food safety, and vector control.
29. The North Dakota Department of Health monitors West Nile surveillance throughout the state.

# Pest Infestation

## (Urban Forest Damaging Pests)

### Mitigation Actions

1. Continue programs to monitor existing and future forest-damaging pests.
2. Continue existing mitigation efforts including the systematic approach to removing ash trees in decline and replant with a different species to increase the diversity of our urban forest. See Capabilities below.
3. Maintain the “City of Bismarck Emerald Ash Borer Response Plan” developed and approved by the Forestry Advisory Board and the City Commission.  
Public Education:
4. Continue public education efforts to diversify tree plantings and reduce potential for transporting pests (Pest infestations) from other areas of the country.

### Vulnerability Summary

*Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. Currently, Dutch Elm Disease is the most prevalent disease impacting trees in Bismarck on an annual basis. Approximately fifty Elm trees are removed in Bismarck each year due to Dutch Elm Disease.
2. Elm trees were hit with a severe infestation of European Elm Scale in 2021 and 2022. All Elm in City boulevards were injected for this pest. The scale has weakened some of our Elm making them more susceptible to other diseases and pests.
3. The most significant risk and vulnerability to our city urban forest is the potential for Emerald Ash Borer.
4. When Emerald Ash Borer impacts Bismarck’s urban forest, extensive resources will be required to combat the spread of the disease, compromising capabilities to address Dutch Elm Disease. These diseases/pests combined have potential to reduce our tree population by 36%.
5. Infested firewood may be transported by campers/travelers.

## Capabilities

### Existing Mitigation Capabilities Specific to the Pest Infestation Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. The City of Bismarck has developed an Emerald Ash Borer Response Plan:  
Plan Purpose: By implementing this plan, the City is attempting to lessen the impact and disruption to its urban forestry program caused when Emerald Ash Borer (EAB) is introduced to Bismarck and the surrounding area. Taking a proactive approach to this threat enables the City to address public and private needs in an efficient and effective manner.
2. Bismarck has a Dutch Elm Disease control program consisting of firewood inspections in March to identify properties that have Elm firewood. Bismarck has forestry staff that monitors the city looking for symptoms of DED. Elms on private property that test positive for DED are abated. Public trees are promptly removed if tested positive for DED.
3. The City has ordinances and policies that affect the City’s urban forest. The City Forester does have the authority to abate “nuisance” trees on private property:  
13-01-01 (16). Definitions. "Public nuisance" means any dangerous or unsafe trees or portions thereof; any trees encroaching on public sidewalks or impeding vehicular travel on the streets in violation of standards set by the City Forester

pursuant to Section 13-02-01(3); any trees located in the sight triangle in violation of Section 14-03-05(3); and any tree harboring insect or disease organisms of a contagious and fatal nature which pose a serious threat to surrounding trees if not immediately removed and disposed of, or treated with proper arboricultural procedure.

13-02-08 (4). Removal, Planting and Replacement. "If any part or the whole of any tree on private premises is found after proper investigation to be dangerous or unsafe, or otherwise constitute a public nuisance, the city forester shall declare the tree or portion thereof a public nuisance and cause the nuisance to be abated pursuant to Section 13-02-14."

The Forestry Advisory Board (FAB) made a motion and approved to include EAB into this "nuisance" tree category at the February 2010 meeting. The Forestry Advisory Board also approved a "Structured Removal Plan". This will address removal of ash trees that are in the "poor and severe decline" condition class, ash trees impacted by water service construction projects, or needing cabling and bracing before EAB arrives. The intent is to slow the spread of EAB by reducing host trees, and gaining time in future removals.

4. Bismarck has a Forestry Advisory Board to provide direction and recommendations to the City Forester regarding the health of the urban forest.  
<http://www.bismarcknd.gov/index.aspx?nid=929>
5. Bismarck participated in a USDA Forest Service/APHIS EAB EOC response exercise.
6. Bismarck has participated in the EAB Awareness week for the last 10 years to 15 years.
7. The ND Dept of Agriculture has an EAB trapping program. Traps are hung throughout the City and Parks in Bismarck each year to monitor for the pest.
8. Public Education is provided via City Forestry web pages regarding Pest infestations.  
<http://www.bismarcknd.gov/index.aspx?NID=1399>  
<http://www.bismarcknd.gov/DocumentCenter/Home/View/2697>
9. Several organizations and agencies are currently involved in various preparation activities, they are: NDSU Extension, ND Department of Agriculture and ND Forest Service. <https://www.ndda.nd.gov/eab>

# Severe Summer Weather

See Also “Tornado”

## Mitigation Actions

See also Tornado Hazard within this plan section for a summary of applicable mitigation actions, vulnerabilities, and capabilities specific to the tornado hazard (and applicable to Severe Summer Weather Hazard).

Public Education topics:

1. Continue participating in the Severe Summer Weather Awareness campaign.
2. Extreme Heat: Do not leave children or pets in the unattended vehicle. *Extreme heat and humidity is one of the leading weather-related killers in the United States, resulting in hundreds of fatalities each year. Source: NWS <https://www.weather.gov/mkx/heatwaves>*
3. Promote the NOAA all-hazards weather radio as a viable option to receive weather alerts/warnings to ensure awareness of risk and provide for recommended actions for personal safety.

## Vulnerability Summary

Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.

1. Those caught outdoors during a severe thunderstorm are at higher risk.
  - a. High wind related injuries/deaths are caused by flying debris.
  - b. Those taking shelter under or near tall trees are vulnerable to lightning strikes.
  - c. Potential injury from large hail stones
2. Mobile homes are impacted (damaged) at lower winds speeds compared to typical “stick construction” homes and other building types.
3. Those who do not have access to warning or alert systems are at risk. Lack of access or availability to hear or monitor warnings/alerts would compromise the individual’s ability to take appropriate actions.
  - a. A low percentage of the population own NOAA All Hazards Weather Radios:
    - i. NOAA Weather Radio is one of the best indoor warning systems available. Unfortunately, studies have show that only 5-10 percent of the population owns a weather radio (Wolf, 2009).  
2015 Source: <http://www.crh.noaa.gov/dmx/?n=preparesvrwarning>
4. Many residents mistakenly expect to hear “outdoor” warning sirens indoors.
5. As Bismarck expands, the existing outdoor warning system (sirens) may not provide adequate coverage for outdoor recreational areas, residential areas, etc.
6. Overhead power lines, especially those near trees, are vulnerable to high wind events.
  - a. Children and others who may first come across downed power lines are vulnerable.
7. Overhead lines impacted create some fire risk (ie: nearby trees, homes, etc).
8. Those who are most vulnerable to extreme heat include elderly persons, small children, those with disabilities, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions. Others vulnerable to extreme heat are those who must work outdoors, including first responders (ie: Fire, Law, EMS).
  - a. Those who do not have access to air-conditioned rooms.
  - b. Short term power loss is more likely to occur during heat waves as a result of high energy demands.

## Capabilities

### Existing Mitigation Capabilities

#### Specific to the Severe Summer Weather Hazard

*Also see Section 6 for additional listings of mitigation capabilities as well as Tornado Hazard for more capabilities.*

1. MDU manages tree trimming services (via local tree services contractor) to avoid power pole and power line damages.
2. The NWS has in place a system to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety.
3. Bismarck has 23 outdoor warning sirens within city limits. Four additional sirens, which are part of the same system (and activate simultaneously) provide outdoor warning siren coverage within the city of Lincoln, Apple Valley Subdivision, and the University of Mary.
4. NWS provides alerts/warnings and activates both EAS and NOAA All Hazards Weather Radio.
5. Schools and City Government buildings utilize the NOAA All Hazards Weather Radio.
6. Bismarck is recognized as a “Storm Ready” community by the National Weather Service.
7. Bismarck Parks and Recreation has lightning detection siren notification capability at their outdoor recreational locations (such as golf courses).
8. Public education: Severe Weather Awareness Campaign
9. Bismarck has adopted the International Building Code. Chapter 16 is applicable, however, mobile homes are governed by HUD are not required to comply with the International Building Code.

#### International Building Code - Chapter 16 Structural Design - Section 1609 Wind Loads:

**1609.1 Applications** states “Buildings, structures and parts thereof shall be designed to withstand the minimum wind loads prescribed herein. Decreases in wind loads shall not be made for the effect of shielding by other structures.”

- 105 MPH (3 second gust) 33 feet above ground for Risk Category I Buildings and other Structures
- 115 MPH (3 second gust) 33 feet above ground for Risk Category II Buildings and other Structures
- 120 MPH (3 second gust) 33 feet above ground for Risk Category III and IV Buildings and other Structures

2015 Source: [http://publicecodes.cyberregs.com/icod/ibc/2012/icod\\_ibc\\_2012\\_16\\_par090.htm](http://publicecodes.cyberregs.com/icod/ibc/2012/icod_ibc_2012_16_par090.htm)  
Information regarding wind speeds is derived from the link above.

# Space Weather Hazard

## Mitigation Actions

1. Consider EMP shielding devices to protect generators.
2. Develop a communication plan strategy.
  - Communicate the possibility of such an unavoidable event and ensure there are effective communication strategies in place for before, during and after an event. Identify the appropriate scale (trigger point) to use for purposes of informing the public of potential impacts. Coordinate with NWS and Space Weather Prediction Center personnel.

### Public Education topics:

3. Enhance the Emergency Management Website to include Space Weather to enhance awareness of potential impact, including communications challenges.

## Vulnerability Summary

*Refer to the "Vulnerability Assessment" table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. Most space weather poses a threat primarily to users of specialized GPS technology, HF radio communications, or upper-latitude avionics over a brief period and limited geography, though stronger events generally produce impacts over expanded areas  
Note: Chance of a G5 event impacting Earth is 0.4% annually. Chance of a G4 and/or G5 event is 5.8% annually.
2. A severe G4 or G5 geomagnetic storm event could do significant damage to the electrical infrastructure, hinder communications, and cause massive blackouts across the state.
3. Power outages from transformer damage may be long-lasting, and if occurring in connection with extreme heat or cold, may lead to increased human suffering and possible loss of life. The elderly, patients, and infants are highly vulnerable populations.
4. Communication systems are vulnerable due to power outages and due to sensitivity of the electronics. This may compromise communications capabilities normally used to inform the public.
5. Hospitals working without power or on generators, would be working at a reduced capacity. Simultaneously, there are likely to be spikes in the need for medical care due to the lack of electricity for home medical aid devices and the lack of modern conveniences and sanitation facilities, all of which may overwhelm healthcare facilities.
6. Space weather has been linked to pipeline corrosion. Pipelines are natural conduits of currents generated in geomagnetic storms. Pipeline corrosion can cause a hazardous materials incident by weakening the pipe and leading to leaks or catastrophic failure. This can release hazardous substances, which can result in fires, explosions, and severe environmental damage. Corrosion is a significant cause of pipeline incidents, especially for hazardous liquid and gas transmission pipelines.
7. The Bismarck Community is reliant on mitigation stakeholders to deter, prevent, and mitigate the impacts of an electro-magnetic pulse (EMP) event caused by space weather or intentional attack.

## Capabilities

### Existing Mitigation Capabilities Specific to the Space Weather Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. The Space Weather Prediction Center (SWPC) issues watches and warnings when the planet is experiencing elevated geomagnetic events. This occurs during G1 or higher events.
2. There are also mandatory calls to NASA, FEMA, and the North American Electric Reliability Corporation (NERC) when agency's operations may be impacted by space weather. The SWPC reaches out with a call to the NERC regional reliability coordinators whenever the forecast is at Kp7 (G3) or higher to let electric grid operators know that the geomagnetic level is high enough that they should make sure their system is balanced and accounts for surge build up on lines (SWPC, 2023). Calls continue every three hours if the forecast remains at Kp7 or higher.
3. Space weather events are viewed by telescopes, spacecraft, and satellites prior to their arrival on Earth, giving forecasters a 1 to 3-day warning, depending on angle, magnetic fields, and space conditions.
4. The SWPC works with regional council coordinators when geomagnetic levels reach G4 levels to assure that levels are being monitored to avoid overloading and serious damage and outages.
5. The North American Electric Reliability Corporation (NERC) is the organization of grid operators who work together to assure reliable and secure bulk electric production and distribution throughout Canada and the United States. During normal operations, the interconnections operate as if controlled by a single nervous system of electricity transmission, separate from the other interconnection areas.
6. North Dakota is in the Southwest Power Corporation that manages 72,000 miles of transmission lines from North Dakota to Texas and New Mexico. The SWPC and NERC Reliability Coordinators host a quarterly test call to assure reliability for when an event occurs.
7. The State of ND is a net exporter of energy and does not, at this time, utilize its transformer capacity to the point of becoming overloaded. This helps protect the state's grid from serious damage and prolonged outages. *According to the National Research Council (2008), North Dakota ranks amongst the lowest states at using its capacity at seven percent, limiting the likelihood of transformer overloads from a significant geomagnetic event.*

#### **Private Utility Capabilities include:**

1. Montana Dakota Utilities (MDU) receives alerts regarding potential GMD (solar flare events with a K7 or higher rating).
2. MDU conducts six drills per year to switch controls from Bismarck/Mandan and vice versa.
3. Bismarck/MDU has three system inputs (redundancies): Garrison, Heskett and WAPA.
4. Bismarck is strategically located for power restoration based on logistics/proximity to power generation and distribution.
5. MDU has mutual aid assistance agreements with other utility companies.
6. MDU has pre-determined priority considerations including hospitals, police station, etc.
7. MDU Electric System Compliance Manager serves as a liaison between MDU and the North American Electric Reliability Corporation (NERC).
8. Materials needed by MDU are readily available per MDU plans/agreements with their vendors.

9. Central Power Electric Cooperative (CPEC), formerly Capital Electric Cooperative, has assistance agreements with other utility companies (mutual aid).
10. CPEC utilizes multiple contractors for restoration which provides for a force multiplier and quicker response.
11. CPEC has two system inputs: Heskett and WAPA.
12. CPEC has capability to monitor individual meters to determine if a facility or home is receiving power.
13. CPEC has generator power to sustain operations at its facility.
14. CPEC has the ability to redirect existing power through its distribution system.

# Terrorist, or Nation-State Attack

Note: For purposes of safety and security, specific vulnerabilities and mitigation projects will not be presented in this plan for this hazard. General mitigation recommendations and existing mitigation are identified. A hazard profile for this hazard is included in Section 9 of this plan.

## Mitigation Actions

1. Continue those mitigation activities already in place as summarized in the table below (Capabilities).
2. Recommendation for city facilities and public/private critical infrastructure entities: Request a site assistance visit from the ND State and Local Intelligence Center to facilitate identification of vulnerabilities and identify mitigation options. See “pre-existing mitigation” table below.

Public Education topics:

3. Share Mitigation Strategies as recommended by the ND State and Local Intelligence Center as a resource for the city, local businesses and citizens. See “Capabilities” table below.

## Capabilities

### Existing Mitigation Capabilities

#### Specific to the Terrorist, or Nation-State Attack Hazard

*Also see Section 6 for additional listings of mitigation capabilities.*

1. The Bismarck Police Department (BPD), along with law enforcement agencies across the state share, analyze, and disseminate intelligence via the ND State and Local Intelligence Center (ND SLIC) network. Law Enforcement connected to the information sharing network established by SLIC are able to access intelligence regarding potential threats such as individual offenders, on-line activity, planned protests, criminal organizations, etc.
2. The BPD actively tracks on-line activity and intelligence via the BPD Intelligence Led Policing Program which is staffed by two full-time officers. The intelligence officers hold weekly intelligence briefings at the BPD (and on-line) and share information with numerous surrounding agencies. This has been a highly successful program and allows us to track on-line activity/intelligence that may impact our local community. SLIC Officers also attend this briefing and are able to share our department level intelligence via their network.
3. The North Dakota State Local and Intelligence Center (NDSLIC) is the primary state agency for terrorism and has a system to report suspicious activities to the state for further investigation. Online reports are made at <https://apps.attorneygeneral.nd.gov/tip>
4. The Bismarck Airport displays the national “If you See Something, Say Something” campaign, visible to travelers: <https://www.dhs.gov/see-something-say-something>

5. The ND State and Local Intelligence Center provides guidance regarding mitigation and prevention measures, including the following resources:

Mitigation and Prevention Resource	Embedded Link
<a href="#">State Assistance Visit - NDSLIC</a>	<a href="https://www.ndslic.nd.gov/critical-infrastructure-ci/site-assistance-visits-savs">https://www.ndslic.nd.gov/critical-infrastructure-ci/site-assistance-visits-savs</a>
<a href="#">Submit a Suspicious Activity Report – NDSLIC</a>	<a href="https://www.ndslic.nd.gov/">https://www.ndslic.nd.gov/</a>
<a href="#">Mass Gatherings: Security Awareness for Soft Targets and Crowded Places - CISA</a>	<a href="https://www.cisa.gov/sites/default/files/publications/Mass%20Gatherings%20-%20Security%20Awareness%20for%20ST-CP.PDF">https://www.cisa.gov/sites/default/files/publications/Mass%20Gatherings%20-%20Security%20Awareness%20for%20ST-CP.PDF</a>
<a href="#">Active Assailant Security Resources</a>	<a href="https://www.cisa.gov/topics/physical-security/active-shooter-preparedness/active-assailant-security-resources">https://www.cisa.gov/topics/physical-security/active-shooter-preparedness/active-assailant-security-resources</a>
<a href="#">Unattended vs Suspicious Bag - CISA</a>	<a href="https://www.cisa.gov/sites/default/files/publications/Unattended-vs-Suspicious-Postcard.pdf">https://www.cisa.gov/sites/default/files/publications/Unattended-vs-Suspicious-Postcard.pdf</a>
<a href="#">Hate Crime Threat Guide</a>	<a href="https://www.justice.gov/hatecrimes/media/1135921/dl?inline=">https://www.justice.gov/hatecrimes/media/1135921/dl?inline=</a>

*Also, see “Active Threat” and “Civil Disturbance” summaries within this plan section for additional mitigation efforts in place and applicable to this hazard.*

# Tornado

## Mitigation Actions

1. Include a Tornado Safe Room to EF4 standards within any new construction of city-owned critical facilities where applicable, based on occupancy.
2. Outdoor Warning Sirens - identify need and install additional sirens as the city expands.
3. Update the Land Development Code to ensure space for sirens is reserved during the planning phase of development.
4. Ensure NOAA All Hazards Weather Radios are located in all city owned buildings.
5. Promote the NOAA All Hazards Weather Radio – for all homes and businesses to consider as a primary indoor or portable system for receiving alerts/warnings.
6. Encourage Wind-Resistant Building Techniques

### Public Education:

7. Coordinate public education efforts with local schools and local entities (non-profit organizations) serving as liaisons to newcomers and other vulnerable population groups.
8. Promote shelter pre-planning at the individual and worksite levels to include recommendations to take shelter during a tornado watch and avoid tendencies to relocate during a tornado warning.

### Public Education topics include:

- Safe Room construction and protecting property from high winds
- Encourage mobile homeowners and park owners to conduct joint shelter planning
- Encourage mobile homeowners to explore potential sheltering options (agreements) with area facilities (such as place of employment, membership, etc).
- Promote NOAA All Hazard Weather Radios
- Promote NWS Severe Weather Spotter Training as events are scheduled
- Communicate the purpose of Outdoor Warning Sirens (as “Outdoor” warning siren system)

## Vulnerability Summary

*Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. Most tornado injuries/deaths are caused by flying debris. Those caught outdoors during a tornado event are at higher risk.
  - a. Loose debris
  - b. Outdoor items not anchored
  - c. Construction sites may contain unsecured construction materials (ex:plywood) and debris
  - d. Trees are impacted at lower wind speeds (small branches – flying debris).
2. Mobile homes are impacted (damaged) at lower winds speeds compared to typical “stick construction” homes and other building types. Occupants of mobile homes during a tornado event are at higher risk. Bismarck has several mobile home park neighborhoods. The vast majority of mobile home parks within Bismarck do not have designated storm shelters on site.
3. Bismarck does not restrict future development of mobile home parks. This allows for more affordable housing, however, future construction of mobile home parks would create additional vulnerability.
4. Those who do not have access to warning or alert systems are at risk. Lack of access or availability to hear or monitor warnings/alerts would compromise the individual's ability to take appropriate actions.
5. Many citizens are NOT aware of and/or utilize NOAA All Hazards Weather Radios.

6. Some residents expect to hear “outdoor” warning sirens indoors, which is not the purpose of the outdoor warning sirens.
7. As Bismarck expands, the existing outdoor warning system (sirens) may not provide adequate coverage for outdoor recreational areas, residential areas, etc., increasing community vulnerability.
8. Not all tornadoes are able to be detected by Doppler radar – especially if the tornado forms over the top of the radar and over the city itself.
9. The two hospitals are in close proximity. Depending on the event, if one hospital is impacted, both could potentially be within the same tornado path.
10. There are no community (public or private) tornado shelters identified.

Who’s Most at Risk:

- People in mobile homes
- The elderly, very young, and the physically or mentally impaired
- People who may not understand the warning due to a language barrier
- People in an unfamiliar place such as tourists
- People that are outdoors
- Those in automobiles

## Capabilities

### Existing Mitigation Capabilities Specific to the Tornado Hazard

*Also see Section 6 for additional listings of mitigation capabilities as well as the Severe Summer Weather Hazard for applicable capabilities.*

1. Bismarck has 23 outdoor warning sirens within city limits. Four additional sirens provide outdoor warning coverage in the areas of Lincoln, Apple Valley Subdivision, and the University of Mary.
2. NWS provides alerts/warnings and activates both EAS and NOAA All Hazards Weather Radio.
3. Schools and City Government buildings utilize the NOAA All Hazards Weather Radio.
4. Bismarck is recognized as a “Storm Ready” community by the National Weather Service.
5. Many traditional construction homes within Bismarck have basements.
6. Public education: Severe Summer Weather Awareness Campaign
7. Bismarck Forestry provides for public education and promotes the benefits of trees to include shade (extreme heat, urban heat island effect, and wind protection).
8. Bismarck has adopted the International Building Code. Chapter 16 is applicable, however, mobile homes are governed by HUD are not required to comply with the International Building Code.

International Building Code - Chapter 16 Structural Design - Section 1609 Wind Loads:

**1609.1 Applications** states “Buildings, structures and parts thereof shall be designed to withstand the minimum wind loads prescribed herein. Decreases in wind loads shall not be made for the effect of shielding by other structures.”

- 105 MPH (3 second gust) 33 feet above ground for Risk Category I Buildings and other Structures
- 115 MPH (3 second gust) 33 feet above ground for Risk Category II Buildings and other Structures
- 120 MPH (3 second gust) 33 feet above ground for Risk Category III and IV Buildings and other Structures

2015 Source: [http://publicecodes.cyberregs.com/icod/ibc/2012/icod\\_ibc\\_2012\\_16\\_par090.htm](http://publicecodes.cyberregs.com/icod/ibc/2012/icod_ibc_2012_16_par090.htm)

9. Public Education:

- Severe Weather Spotter Training
- Promote NOAA All Hazards WX Radio
- Staff conduct interviews with local media to promote awareness
- Severe Summer Weather Awareness Campaign

10. Public Information and Warnings: To protect people and property, the **National Weather Service** issues informational products alerting the public to varying degrees of hazardous weather. The following may be issued for severe thunderstorm events:

- Hazardous Weather Outlook: Hazardous weather outlooks alert the public to the possibility for severe weather in the area from one to seven days in advance.
- Severe Thunderstorm Watch: Severe thunderstorm watches are issued by the Storm Prediction Center when conditions for severe thunderstorms appear favorable for an area over the next several hours. Watches are typically in effect for 4-6 hours.
- Severe Thunderstorm Warning: Severe thunderstorm warnings are issued when Doppler radar indicates or the public reports a thunderstorm with wind gusts of 58 mph or greater and/or hail 1 inch or larger in diameter. The warning is usually valid for 30-60 minutes.
- Tornado Watch: Tornado watches are issued by the Storm Prediction Center when conditions for tornadoes and severe thunderstorms appear especially favorable for an area over the next several hours. Watches are typically in effect for 4-6 hours.
- Tornado Warning: Tornado warnings are issued when Doppler radar indicates or the public reports a tornado. The warning is usually valid for 15-45 minutes.

# Train Derailment

## Mitigation Actions

1. Locate new critical facilities at least ¼ mile away from railroad lines: a. When building new or relocating critical facilities, the City of Bismarck should provide additional consideration or preference for location options at least ¼ mile from either railroad line. Assuming there are viable location options at least ¼ mile from the railroad lines of equal value and functionality, locating critical facilities at least ¼ mile away would reduce the loss potential.
2. Public Education: Evacuation and Shelter-In-Place Emergency Preparedness
  - Special Populations Considerations: Bismarck State College and occupancies within ½ mile of railroad lines.

## Vulnerability Summary

*Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

*Note: The vulnerability statements below do NOT imply likelihood or high probability of a significant train derailment incident involving fire, hazardous materials, and/or explosion.*

1. Hospital locations: Both major hospitals are in close proximity to the BNSF railroad. A significant incident (ie: fire, hazmat, explosion) could potentially affect both hospitals depending on the location of incident occurrence.
2. Continuity of Government Operations: City owned critical facilities in very close proximity to either railroad line include the Water Treatment Plant, Public Health, and Public Works. City facilities, if impacted as a result of a significant incident (ie: fire, hazmat, explosion), would create challenges to sustain continuity of operations. The City/County Building is also within close proximity. There are several additional critical facilities within ½ mile of railroad lines including city, county, state (ie: State Emergency Operations Center), federal, and emergency service facilities. Of note: Public Works is in close proximity to Praxair, which could expand the magnitude of a significant train derailment incident near that location.
3. County, State, and Federal facilities may also be impacted, such as the State EOC at Fraine Barracks. An incident impacting county, state, or federal government facilities may impact the ability to provide assistance while re-establishing continuity of operations.
4. There are 22 schools and daycares within ½ mile proximity to the railroad as of October 2025. Schools and daycares are widely dispersed along the rail lines, therefore, at least one school is likely to be involved following a significant derailment incident (ie: fire, hazmat, explosion). Depending on time of day of a potential incident, elementary school population may be outdoors.
5. Vulnerable populations within ½ mile of the railroad lines and vulnerable properties based on topography include various assisted living and nursing homes, the Elks Pool, Bismarck Community Bowl, Front Street Plaza (based on proximity and topography), and the ND State Penitentiary.
6. Due to evacuation challenges, the ND State Penitentiary is a very vulnerable special population.
7. Based on a relatively even distribution of various facilities and populations, a significant train derailment incident (ie: fire, hazmat, explosion) would likely include impact to several properties and populations including the following categories: critical facilities, critical infrastructure, waterways (Missouri River, Hay Creek, or storm water drainage system), schools, hazmat fixed facilities, and/or special populations. This would overwhelm local response capabilities. Additional resources would be requested including mutual aid, private, state and federal assistance. However, response times of support agencies may not support the immediate incident needs of evacuation and rescue efforts.
8. Based on potential impact to local communications critical infrastructure, emergency messaging capability via radio and television may be diminished, creating a higher vulnerability for those citizens who primarily get their emergency messages from local radio and television.

9. Vehicles, vehicle occupants, and pedestrians are vulnerable at railroad crossings, if/when making inappropriate attempts to cross, such as by-passing barriers in place.

**Capabilities**  
**Existing Mitigation Capabilities Specific to the Train Derailment Hazard**  
*Also see Section 6 for additional listings of mitigation capabilities.*

1. Maximum Speed Limits:
  - a. 35 MPH – BNSF Line
  - b. 10 MPH – DMVW
2. Maximum speed and inspection requirements are regulated by the Federal Railroad Administration.
3. Railroad Crossings and improvement projects per Quiet Rail Zone approved at 3rd, 5<sup>th</sup>, and 12<sup>th</sup> Street railroad crossing locations are completed (2017).
4. Bismarck Fire is aware of the hazardous materials transported by rail through Bismarck via reports shared by railroad industry.
5. Bismarck Fire Department continues to enhance training efforts as it relates to the various types of train cars, hazardous materials response, and also participates in training and exercise activities with mutual aid partners and stakeholders including the railway industry.
6. 7<sup>th</sup> and 9<sup>th</sup> Street locations are railroad overpasses are BNSF ownership. DOT in concert with the FRA inspects the structures on a three-year rotation .
7. On August 2, 2013 the FRA issued an Emergency Order and Safety Advisory regarding the movements of flammable liquids, which includes crude oil and ethanol.
  - a. The FRA Emergency Order contained requirements for unattended trains carrying hazardous material such as chlorine that is classified as Toxic by Inhalation (TIH) or 20 or more loads of certain flammable liquids like crude oil and ethanol.
  - b. Trains may not be left unattended per BNSF communications.
8. New tank cars (DOT-117) constructed after 10/1/2015 must feature a 9/16-inch shell, 11-gauge jacket, one-half-inch, full-height head shield, thermal protection, and improved pressure-relief valves and bottom outlet valves. Existing tank cars must be retrofitted with the same key components based on a "prescriptive, risk-based" retrofit schedule, according to the USDOT. The final rule required replacing DOT-111 tank cars for Packing Group I, which covers most crude shipped by rail, within three years (2018 timeframe).

*BNSF mitigation and safety measures summary (source: BNSF representative):*

9. BNSF inspects tracks in Bismarck four times per week. The FRA requirement is twice per week. Inspections of all BNSF bridge structures are performed at least once annually. BNSF has a staff of trained bridge inspectors, as well as structural engineers, consultants and specialized contractors. Ownership: 7<sup>th</sup> and 9<sup>th</sup> Street locations railroad overpasses are BNSF ownership. DOT in concert with the FRA inspects the structures on a three-year rotation.
10. Rail Industry (BNSF) voluntarily adopted stronger tank car standards in October 2011 and November 2013. The “new” car has ½” or 7/16” jacketed shell (versus 7/16 only), a ½” protective head shield, roll over protection (top fitting protection), larger pressure release valve, and approximately 47-77% better crashworthiness. BNSF makes available the “System Emergency Response Plan” via BNSFHazmat.com as well as other training, preparedness/planning materials.

11. Additional BNSF Prevention Measures include:			
<u>Human Factor</u> <ul style="list-style-type: none"> <li>• Training</li> <li>• Remote Monitoring</li> <li>• Positive Train Control</li> <li>• Self-reporting protocol</li> </ul>	<u>Equipment/Mechanical</u> <ul style="list-style-type: none"> <li>• Ultrasonic inspection</li> <li>• Detector Network, such as Dragging Equipment</li> <li>• Technology including force-based/strain gage systems</li> <li>• Thermal/infrared scanning for warm bearing detection</li> </ul>	<u>Track/Signal</u> <ul style="list-style-type: none"> <li>• Enhanced track inspection training</li> <li>• Continued elimination of jointed rail</li> <li>• Strong capital program for tie renewal</li> <li>• Technology including ground penetrating radar and enhanced geometry testing</li> </ul>	<u>Miscellaneous</u> Operating Practices/Alerts: <ul style="list-style-type: none"> <li>• High Wind: staging and/or speed requirements</li> <li>• Tornado: requirements to stop, inspect trains</li> <li>• Flood: speed restrictions, additional inspections</li> <li>• Cold weather: speed restrictions</li> </ul>

# Wildland Fire

## (Wildland Urban Interface)

### Mitigation Actions

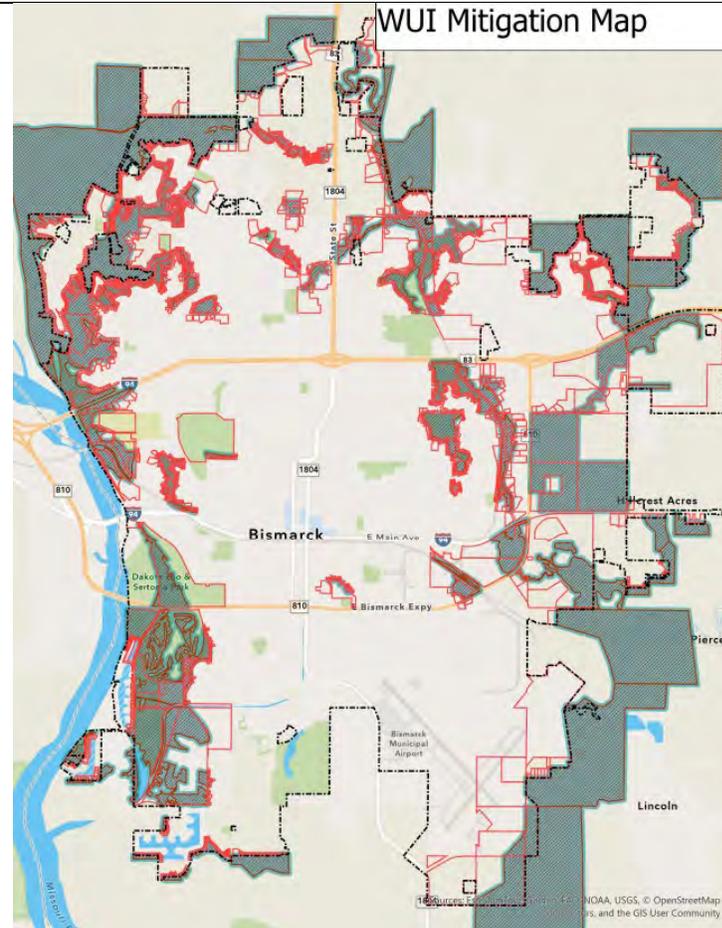
1. Maintain Wildland Fire-Break Trail in Southwest Bismarck.
2. Update the Wildland Fire Urban Interface risk map annually or as needed based on city annexations.
3. Continue to provide for public education efforts, including media releases, interviews, website updates, and public outreach. Public outreach shall include specific mailings to property owners within the wildland fire risk areas every three years or as applicable based on drought conditions. Public education efforts utilize Firewise program guidance.
4. Share Firewise landscaping concepts with developers and the Planning Department.
5. Share Air Quality Information alerts when disseminated by the ND Department of Environmental Quality, along with applicable Shelter In Place recommendations.  
<https://deg.nd.gov/AQ/monitoring/>
6. Provide “AirNow” air quality information via the city’s website within Emergency Management web pages. [Interactive Map of Air Quality](#)

### Vulnerability Summary

*Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.*

1. Homes and other structures located in wildland risk areas as mapped are vulnerable to wildland fire due to the proximity to wildland vegetation and relatively steep slopes which can increase the rate of spread of fire. The likelihood of a wildland fire being a high magnitude event is low.
2. Areas within Bismarck that may have more exposure potential compared to other areas include the northwest portion of the city that is adjacent to undeveloped property and the southwest portion of the city that is adjacent to more heavily forested areas.

The map at right illustrates the wildland urban interface areas as well as the parcels adjacent to the WUI areas.



<p><b>Capabilities</b>  <b>Existing Mitigation Capabilities Specific to the Wildland Fire Hazard</b>  <b>Wildland Urban Interface (WUI)</b>  <i>Also see Section 6 for additional listings of mitigation capabilities.</i></p>	
<p>1. Fire Trail – Fuel Mitigation Project – completed 2002. A Fire break was created to reduce vulnerability to homes in southwest Bismarck as illustrated by the map on right. This fire trail/ fire break proved to be beneficial during a fire fight event in April 2005.</p>	
<p>2. The bike/walking path west of Solheim to Riverwood Drive serves as a fire break. See map below.</p>	
	<p>3. Public Education: Public Education materials are available to inform property owners adjacent to the wildland risk areas (wildland urban interface) of recommendations as described by the Firewise Program, especially during times of drought and higher fire risk. <a href="http://www.firewise.com">www.firewise.com</a></p> <p>4. Bismarck Fire completes the following on-going activities.</p> <p>5. Perform Fire Safety Inspections of all local businesses</p> <p>6. Firefighters train in the latest methods of fighting all types of fire.</p> <p>7. Bismarck Fire continues public education efforts including:</p> <ol style="list-style-type: none"> <li>a. Presentation to grade schools</li> <li>b. Demonstrations in a smoke trailer that gives kids skills to get out of a home on fire</li> <li>c. Tours of fire stations to civic groups</li> <li>d. Safety tips to the public through local media</li> </ol> <p>8. Response Capabilities: The City of Bismarck is protected by a full-time fire department including 5 fire stations. We have 2 fully equipped wild-land firefighting apparatus able to access remote areas within the city limits. Many of our Wild-land Urban Interface (WUI) areas border Bismarck City and Burleigh County properties. We have mutual aid agreements with the Bismarck Rural Fire Department, Mandan Fire Department, and ND Forest Service. Not only does this aid in fighting fires in the WUI but we can also call on them to assist firefighting efforts within the city limits.</p> <p>9. ND Department of Environmental Quality provides Alerts to the public when air quality is affected by wildfires (regardless of Wildfire location) or other incidents. ND DEQ air monitoring: <a href="https://deq.nd.gov/AQ/monitoring/">https://deq.nd.gov/AQ/monitoring/</a></p> <p>10. Bismarck Public Schools has policies/procedures relating to postponing or canceling outdoor events as a result of poor outdoor air quality. Bismarck Parks and Recreation follows those same policies.</p>

# Winter Storm

## Severe Winter Weather

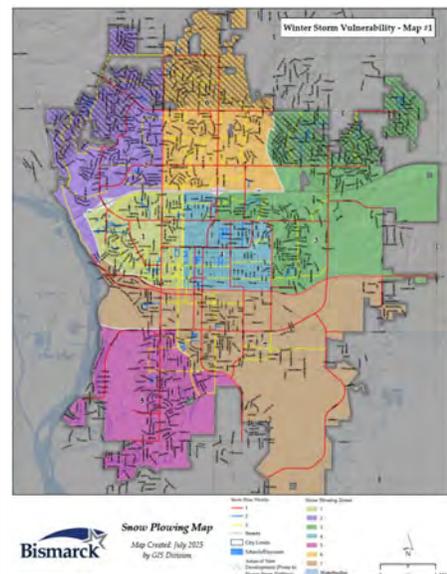
### Mitigation Actions

1. Identify and implement coordinated, community-driven solutions to effectively support individuals experiencing homelessness, behavioral health crises, or substance use disorders.
  2. Evaluate need and opportunity for snow fences.
  3. Identify critical facilities and infrastructure having or needing back-up generators or upgrades (ie: critical facilities and shelter locations).
  4. Ensure back-up generators are in place at all city-owned Critical Facilities. Ensure the back-up generators allow for continued operations of critical and essential functions.
  5. Develop an Emergency Agreement with private vendors for delivery of fuel for generators.
  6. Coordinate school/city/business closure communications/decisions.
  7. Downed Power Line Safety Training (Forestry Staff)
- Public Education:
8. Public Education - emphasis on dangers of downed power lines and utilizing alternate work start/stop times to minimize rush hour traffic.
  9. Public Education: Participate in the Severe Winter Weather Awareness Campaign (on-going).
  10. Coordinate public education efforts with local schools and local entities (non-profit organizations) serving as liaisons to newcomers who may not be familiar with ND winters.

### Vulnerability Summary

Refer to the “Vulnerability Assessment” table within Section 9 of this document for a more complete listing of vulnerabilities relating to this hazard.

1. Areas of new development are prone to experience heavy snow drifting due to the limited number of mature trees or other vegetation. The hatched areas within the snow emergency route map illustrate the new development areas currently prone to heavy snow drifting. This vulnerability will continue to migrate north and east as the city grows. See hatched area, map on right. A full size map is included in Section 9.
2. As noted on the snow emergency route map, residential areas are the last priority in terms of clearing streets during and after a winter storm event. During a winter storm event, crews focus on keeping the high priority emergency routes and major arterials clear. Therefore, residential areas are more vulnerable (ie: lack of ingress/egress) during, and for several hours following a major snowfall event. However, existing response plans are in place to re-route snow plows for emergency situations. See map on right or web link:  
<http://www.bismarcknd.gov/index.aspx?NID=249>

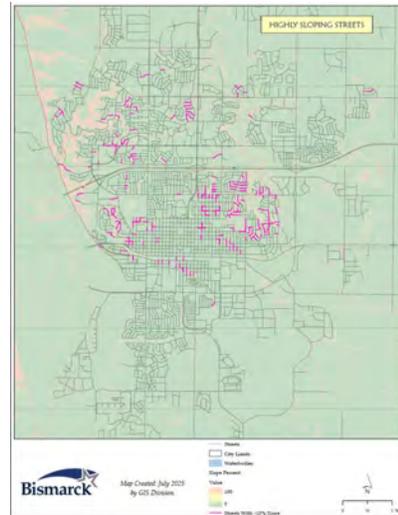


3. Some areas of Bismarck more vulnerable as a result of icy conditions due to a relatively significant slope. These areas are mapped (see right). A full size map is included in Section 9.

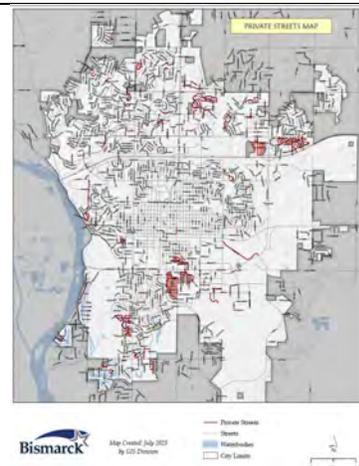
Streets with greater than a 14% slope:

- 500 Block of S 11<sup>TH</sup> ST – up to 19.9%
- 1500-1600 Block of Northview Ln – up to about 16.5%
- 2300 Block of Pointe Lp – up to 14.8%
- 800-900 Block of N Mandan St – up to 14.8%
- 1600 Block of N 35<sup>TH</sup> ST – up to 14.5%
- 2900 Block of E C Ave – up to 14.5%
- 700-800 Block of N 27<sup>TH</sup> ST – up to 14.5%
- 2400 Block of Laforest Ave – up to 14.4%
- 2900 Block of E B Ave – up to 14.3%
- 1200-1300 Block of Crestview Ln – up to 14%

Burnt Boat Drive has 10% slope, but is curvy, narrow, and has steep slopes adjacent.

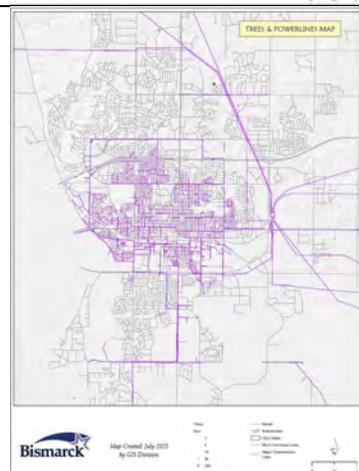


4. Private streets within Bismarck are not cleared by Bismarck Public Works. These areas may or may not be more vulnerable (ie: ingress/egress) depending on the quality and timeliness of private snow clearing services. See map at right. A full-size map is located in Section 9.



5. Many of the older developed areas within Bismarck have overhead power lines. These areas are more vulnerable during an ice storm to experience power loss and/or a downed power-lines. See map on right. A full-size map is included in Section 9.

6. Overhead power-lines intersecting trees create a vulnerability. However, local utility companies proactively trim the trees to mitigate the hazard. See map on right. A full-size map is included in Section 9.



7. Snow plows in operation are likely to be hit by other vehicles during conditions of low visibility. The snow plow operator is at risk, however, the operator of the vehicle is at higher risk for injury/death.
8. Traffic accidents, which may involve hazardous materials in some cases, are more likely to occur as a result of slippery street conditions and/or poor visibility. First responders are more vulnerable during response efforts because of the weather elements.
9. Emergency response times may be delayed as a result of snow and/or ice conditions.

10. Downed power lines as a result of ice storms and/or heavy snow pose a serious life safety risk, especially for children who may come across a downed power line.
11. Power lines near trees (ie: evergreen trees or other trees not trimmed) are vulnerable following an ice storm or heavy snow event. Homeowners are responsible for trimming trees from the transmission line to the home itself.
12. Among the most vulnerable population during winter storm events are the elderly and those with medical conditions (ie: heart). A heavy snow event may delay emergency response to 911 calls.
13. Those who require medications may not be able to fill prescriptions during a winter storm event.
14. Loss of power for a few hours (or longer) poses additional risk to those who require power for life support. Back-up battery or generator power may be needed.
  - The vast majority of local citizens do not have back-up power (generator) capability in the event of an extended power outage. Since power outages in Bismarck are repaired quickly (typically within 2 to 3 hours or less), local citizens are likely not prepared for extended power outages (ie: several days or weeks).
15. The use of portable generators pose risks for those using them as well as for utility line workers if not used or connected correctly. Risks include electrocution, fire, and carbon monoxide poisoning.
16. Food and medical supplies may be delayed due to highway and interstate conditions and road closures.
17. Those required to work outdoors or student population walking to and from school are highly vulnerable to frost bite or hypothermia as a result of extreme cold temperatures and wind chill.
18. Populations of higher vulnerability include tourists, homeless, and those who've recently moved to North Dakota with no previous experience with the more harsh winter season.
19. Those travelling during winter storm events may become stranded or become involved in a traffic accident due to visibility and/or road conditions. There is also a higher vulnerability for those traveling within the city during any power outages affecting traffic signal lights.
20. Potential roof collapse as a result of heavy snow load, especially on wide span flat roofs such as gymnasiums or auditoriums.
21. Sewer vents may freeze up, creating vulnerability to the occupants (ie: illness).
22. Occupants of homes / facilities without carbon monoxide detectors are vulnerable if venting is blocked or if the occupants are using improper alternative heating sources or using them improperly.
23. Traffic accidents may occur as a result of power loss to traffic signal lights (ie: ice storm impacting power lines)

## **Capabilities**

### **Existing Mitigation Capabilities Specific to the Winter Storm Hazard**

*Also see Section 6 for additional listings of mitigation capabilities.*

1. Snow Emergency Routes are designated, signed, and communicated to the public via the city's website. Snow Emergency Routes are designated in City Ordinances 10-02-01 and 10-02-02.
2. City Ordinance 10-02-03 provides for capability to issue a "snow emergency declaration" which allows for prohibition of parking on designated (or all) snow emergency routes.
3. Although Bismarck utilizes snow gates on the plows, City Ordinance 10-02-05 allows for snow plow operations to discontinue the use of the snow gates when a snow emergency is declared. The same city ordinance also allows for taking certain actions when necessary including posting no parking signs to aid in snow removal and hiring of temporary personnel for snow removal. Ordinance 10-05-05 addresses placement of mail boxes to avoid the mailboxes becoming snow removal obstacles.
4. Ordinance 12-13-23 provides officers with authority to remove illegally stopped or parked vehicles when the vehicle is parked on a posted "snow emergency" route during a declared snow emergency.
5. City sanding operations may start before, during, after, or independently of other plowing operations, as appropriate. Public works strives to obtain an 8% salt content within this sand to prevent the sand from freezing/clumping. Public Works also has liquid brine applicators. Applying liquid brine prevents ice from sticking to the streets. This is applied sparingly to minimize environmental impacts.
6. Local utility companies trim trees around their power poles and power lines to minimize risk of utility infrastructure damage following events that may severely impact trees and/or limbs. The current pruning area for MDU is from the East and West Avenue A up to Boulevard and from Washington to 3<sup>rd</sup>. This pruning is does not include the house connections (main transmission line to the house), this falls on the responsibility of the home owner.
7. Public Works has back-up power capabilities to maintain traffic signals (partial).
8. Back-up generators are in place within city-owned critical facilities and infrastructure.
9. Bismarck has adopted the International Building Code which identifies construction requirements relating to heavy snow loads.
10. Public Education is conducted in concert or partnership with the National Weather Service as well as many other departments at the local, state, and federal government level as well as volunteer agencies promoting emergency preparedness, such as the American Red Cross.
  - a. Severe Winter Weather Awareness Campaign – annual
  - b. Installation of carbon-monoxide detectors
11. Public Information and Warnings are issued via the National Weather Service (see next page).
12. Emergency Alert System in place
  - a. Public Information and Warnings via the National Weather Service
13. NOAA Weather Radio in all Bismarck Public Schools – in place  
National Weather Service - "Storm Ready" recognition – Recertified / approved in 2012

<p>14. A Living Snow Fence was put in place (1990s) to prevent the drifting of snow across Yegan Road to the south and east. Due to the airport chain-link perimeter fence creating a drifting problem, the three rows of shrubs were installed to help drop the snow blowing from across the airport property, potentially blocking Yegan Road. The shrubs planted do NOT attract birds to reduce the possibility of bird strikes on airplanes.</p> <p>15. The National Weather Service (Bismarck Office) provides for decision support services, providing valuable situational awareness for planning prior to anticipated storm events.</p>	
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<p><b>Response Phase Mitigation – Winter Storm:</b></p>	
<ol style="list-style-type: none"> <li>1. Public Works maintains its Snow and Ice Control Plan. The plan identifies snow removal priorities which are publicized on the city’s website.</li> <li>2. The Bismarck Emergency Operations Plan outlines task force operations for Winter Storm Emergency Response.</li> <li>3. The Roughrider Snowmobile Club serves as a resource for critical (life-saving) transportation.</li> <li>4. Public Works has emergency generators and connectivity to maintain the functioning of traffic signals following power outages.</li> <li>5. Existing shelter sites (with generators) may be used as warming sites.</li> </ol>	

<p><b>National Weather Service Provides Forecast and Warning Services</b></p>		
<p><b>Product Type</b></p>	<p><b>Description</b></p>	<p><b>When Issued</b></p>
<p>Hazardous Weather Outlook</p>	<p>Designed to outline anticipated weather hazards for the next seven days and provide the first heads up to any possible severe winter weather.</p>	<p>At least once per day</p>
<p>Watch</p>	<p>Issued when the confidence level for severe winter weather is at least 50% (uncertainty remains in exact timing and location of the storm).</p>	<p>Normally issued 36-48 hours prior to the event</p>
<p>Warning</p>	<p>Issued when there is a direct threat to life and property from severe winter weather that has a high probability of occurrence (80% or higher), or is imminent or occurring.</p>	<p>Normally issued 12-24 hours prior to the event</p>
<p>Advisory</p>	<p>Issued for winter weather conditions that have a high probability of occurrence, are imminent or already occurring, that may cause an inconvenience. If precautions are NOT taken, a situation may develop that may threaten life.</p>	<p>Normally issued 12-24 hours prior to the event</p>

<b>Product Type</b>	<b>Description</b>
Blizzard Warning	When sustained or frequent wind gusts of 35 mph or greater with visibilities of less than one quarter mile for at least three hours are expected.
Winter Storm Warning	When six inches of snow in 12 hours or 8 inches in 24 hours are expected and/or 1/2 inch of sleet accumulation (mixed precipitation and blowing snow may also be possible).
Ice Storm Warning	When 0.25 inches or more of ice accumulation is expected.
Wind Chill Warning	When wind chill values of -40 F or less are expected.

[https://www.weather.gov/bis/winter\\_weather\\_awareness\\_1](https://www.weather.gov/bis/winter_weather_awareness_1)

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# Mitigation Implementation Action Plan

1. Mitigation Action items will be monitored and evaluated for progress by the applicable city department or division as assigned.
2. Mitigation action items will be incorporated by the applicable department/division into existing annual strategic or work-plans at the department level. Bismarck Emergency Management will also review the status of mitigation action items with the applicable city departments/divisions.
3. City Administration will coordinate with the applicable city department to integrate the requirements of the mitigation plan into other plans and funding mechanisms (ie: annual budgeting process, capital improvement program, growth management plan, future land use plan, plat review process, site plan review process) when appropriate.

<b>Administration</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Dam Failure	Locate new critical facilities outside inundation area when possible: When building, remodeling, or relocating critical facilities, the City of Bismarck should provide additional consideration or preference for location options outside of the dam failure inundation area. Because the probability of a catastrophic dam failure is very low, locating critical facilities outside the inundation area is NOT a requirement. However, assuming there are viable location options outside of the inundation area of equal value and functionality, locating outside the inundation area would reduce the loss potential.		Planning Function  No cost	2015		Yes	<b>Complete</b> and On-going See status update below.
<i>The future location for the Bismarck Police Department will be in northeast Bismarck, outside of the dam failure zone. Other recent facilities constructed and located outside of the dam failure zone include Fire Station #4 as well as CenCom and the Emergency Operations Center.</i>							
Train Derailment	Locate new critical facilities at least ¼ mile away from railroad lines: a. When building new or relocating critical facilities, the City of Bismarck should provide additional consideration or preference for location options at least		Planning Function  No cost	2015		Yes	<b>Complete</b> and On-going See comment below.

<b>Administration</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
	<p>¼ mile from either railroad line. Assuming there are viable location options at least ¼ mile from the railroad lines of equal value and functionality, locating critical facilities at least ¼ mile away would reduce the loss potential.</p> <p>Both the CenCom/EOC facility and Fire Station #4 met the mitigation recommendation above. The future Police Department location will also meet this mitigation recommendation.</p>						
Winter Storm	Implement City Office closure policy based on imminent or current conditions.		Staff Time	2025			<b>Complete and On-going</b>
Winter Storm	Coordinate school/city/business closure communications/decisions.	Bismarck Public Schools	Staff Time	2015		Yes	<b>Complete and On-going</b>
<b>Public Education</b>							
Winter Storm	Coordinate public education efforts with internal and local entities (non-profit organizations) serving as liaisons to newcomers who may not be familiar with ND winters.		Staff Time	2025		Yes	<b>New</b>

<b>Airport</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Aircraft Accident	Maintain the current airport hazard mitigation and emergency response plans and planning efforts identified as existing mitigation Capabilities within Section 3 of this plan document.		Staff time	2025		Yes	<b>Complete</b> and on-going
Aircraft Accident	Recommend Burleigh County and City of Lincoln adopt City of Bismarck aeronautical zoning where applicable based on the City of Lincoln growing nearer to the Airport.	Burleigh County  City of Lincoln	NA	2025	2027	Yes	<b>Complete</b> See comment below.
<i>Recommended changes provided to the Bismarck Planning Department for ordinance changes. (2026)</i>							
Aircraft Accident	Update the Wildlife Hazard Assessment.		Local Funding	2026	2027	Yes	<b>New Update</b> See comment below.
<i>Airport Administration will begin the assessment in 2026, to be completed in 2027.</i>							

<b>Building Inspections</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Flood	Bismarck is currently rated at Class 7 within the Community Rating System. Continue annual re-certifications to sustain the CRS program.	Emergency Management GIS Others		2025		Yes	<b>Complete</b> and On-going
<b>Public Education</b>							
Flood	Coordinate and/or support NFIP flood insurance promotional efforts including the availability of flood insurance for community residents and businesses.	Emergency Management	Staff Time	2015		Yes	<b>Complete</b> and On-going
Tornado	Encourage Wind-Resistant Building Techniques.	Building Inspections	Staff Time	2015		Yes	<b>Complete</b> and On-going

<b>Emergency Management</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Space Weather	Develop a communication plan strategy. <i>Communicate the possibility of such an unavoidable event and ensure there are effective communication strategies in place for before, during and after an event. Identify the appropriate scale (trigger point) to use for purposes of informing the public of potential impacts. Coordinate with NWS and Space Weather Prediction Center personnel.</i>	Comms within Administration	Staff Time	2025	2030		<b>New</b>
Tornado	Outdoor Warning Sirens - identify need and install additional sirens as the city expands.	Administration, Finance, Planning	\$30,000 Each City Funds	2015		Yes	<b>Complete and On-going</b>
<i>Installed three additional sirens in 2023.</i>							
Tornado All	Replace outdoor warning siren activation controller system.		180,000 City Funds	2020	2021	No	<b>Completed</b>
<b>Public Education</b>							
All Hazards	Promote the NOAA all-hazards weather radio as a viable option to receive weather alerts/warnings to ensure awareness of risk and provide for recommended actions for personal safety.	NWS	Staff Time	2015		Yes	<b>Complete and On-going</b>
All Hazards	Promote mitigation and emergency preparedness for all hazards.		Staff Time	2015		Yes	<b>Complete and On-going</b>
All Hazards	Automatic Notification System (CodeRED) – promote opt-in based on new platform.	CenCom	Staff Time	2025		Yes	<b>New</b>
All Hazards	Coordinate public education efforts with local schools and local entities (non-profit organizations) serving as liaisons to newcomers and other vulnerable population groups.	Public Health Comms via Administration	Staff Time	2025		Yes	<b>New</b>

<b>Emergency Management</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Dam Failure	Establish Awareness (public education) of the potential impact of Heart Butte Dam.		Staff Time	2025	2027	Yes	<b>New</b>
Dam Failure	Support public awareness efforts relating to planned maintenance and repair projects relating to the Garrison Dam as well as the Heart Butte Dam.		Staff Time	2025	2027	Yes	<b>New</b>
Dam Failure	Participate in Heart Butte Dam emergency action plan reviews.		Staff Time	2025		Yes	<b>New</b>
Flood	Provide for Flood Mitigation and Preparedness Public Education efforts for local citizens and businesses. (via website content and public presentations upon request).	Building Inspections	Staff Time EM Budget	2015		Yes	<b>Complete and On-going</b>
Flood & Dam Failure	Promote the purchase of flood insurance (National Flood Insurance Program) – community wide.			2025		Yes	<b>Complete and On-going</b>
Hazmat & Train Derailment	Continue Public Education regarding Shelter In Place and Evacuation procedures	Fire		2015		Yes	<b>Complete and On-going</b>
<i>Special Populations Considerations: Bismarck State College and occupancies within ½ mile of railroad lines.</i>							
Severe Summer Weather	Continue participating in the Severe Summer Weather Awareness campaign.		Staff Time EM Budget	2015		Yes	<b>Complete and On-going</b>
Severe Summer Weather	Extreme Heat: Do not leave children or pets in the unattended vehicle.	NWS	Staff Time	2015		Yes	<b>Complete and On-going</b>
Space Weather	Enhance the Emergency Management Website to include Space Weather to enhance awareness of potential impact, including communications challenges.		Staff Time	2025		Yes	<b>New</b>
Tornado	Promote shelter pre-planning at the individual and worksite levels to include recommendations to take shelter during a tornado watch and avoid tendencies to relocate during a tornado warning.	NWS	Staff Time	2025		Yes	<b>Complete and On-going</b>
Tornado	Continue participating in the Severe Summer Weather		Staff Time	2015		Yes	<b>Complete and On-going</b>

<b>Emergency Management</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
	Awareness campaign.						
Tornado	Protect property from high winds (FEMA website) <a href="http://www.fema.gov/media-library/assets/documents/13270?id=3263">http://www.fema.gov/media-library/assets/documents/13270?id=3263</a>		Staff Time	2015		Yes	<b>Complete and On-going</b>
Tornado	Public Information - NWS Warnings (existing mitigation capability)	NWS	Staff Time	2020			<b>New</b>
Tornado	Safe Room Construction Design for property owners (public education) <a href="http://www.fema.gov/media-library/assets/documents/2009?fromSearch=fromsearch&amp;id=1536">http://www.fema.gov/media-library/assets/documents/2009?fromSearch=fromsearch&amp;id=1536</a>		Staff Time	2015		Yes	<b>Complete and On-going</b>
Tornado	Promote the NOAA All Hazards Weather Radio – for all homes and businesses to consider as a primary indoor or portable system for receiving alerts/warnings.		Staff Time	2025		Yes	<b>New</b>
Wildland Fire (WUI)	Share Air Quality Information alerts when disseminated by the ND Department of Environmental Quality, along with applicable Shelter In Place recommendations. <a href="https://deq.nd.gov/AQ/monitoring/">https://deq.nd.gov/AQ/monitoring/</a>		Staff Time	2025		Yes	<b>New</b>
Wildland Fire (WUI)	Provide “AirNow” air quality information via the city’s website within Emergency Management web pages. <a href="#">Interactive Map of Air Quality</a>		Staff Time	2025	2026	Yes	<b>New</b>
Winter Storm	Recommended minimum of 3-day emergency supplies – recommend enhancing preparedness to 1 or 2 weeks of power loss.		Staff Time	2015		Yes	<b>Complete and On-going</b>
Winter Storm	Public Education (on-going) - emphasis on dangers of downed power lines and utilizing alternate work start/stop times to minimize rush hour traffic.	Public Works	Staff Time	2025		Yes	<b>New</b>
Winter Storm	Participate in the Severe Winter Weather Awareness Campaign (on-going).		Staff Time	2015		Yes	<b>Complete and On-going</b>
Winter Storm	Public Information and Warnings (via NWS).	NWS	Staff Time	2020		Yes	<b>Complete and On-going</b>

<b>Engineering</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Flood	South Bismarck Flood Control Study	Public Works	Received Grant Award \$407,384	May 2021	Dec 2023	No	<b>Completed</b>
Flood	South Bismarck Flood Control Mitigation Project: Reconstruct the South Washington Street Closure Structure (gate) and add a pump station at this location. And modify (widen) the drainage ditch in south Bismarck to enhance flood control and to assist in meeting FEMA requirements for flood protection certification.	FEMA DWR City of Bismarck	FEMA ND (DWR) City	2025	2027	No	<b>New</b>
Geologic	Develop a remediation to buttress the active geological slide occurring on River Road north of I94 Grant March Bridge.		Already Funded	2020	2021	No	<b>Completed</b>
Geologic	Finalize and approve the Ash and Ward Coulee Stormwater Master Plan.		Already Funded	2014	2015		<b>Complete</b>
Geologic	Continue to include recommendations regarding development control lines in geological sensitive areas as future planning is done.		NA Planning Function	2015		Yes	<b>Complete and On-going</b>
<b>Public Education</b>							
Geologic	Identify opportunities to inform or remind property owners of property related information regarding potential geologic conditions that may impact them or their property.		TBD based on method of public education	2015		Yes	<b>On-Going</b> See comment below
	Additional geologic hazards potentially affecting private property have not been identified which would promote the need for communicating the hazard to respective landowners.						

<b>Environmental Health</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Infectious Disease	Provide education when conducting food service inspections.		Staff Time	2015		Yes	<b>Complete and On-going</b>
Infectious Disease	Implement risk-based inspection frequency for food establishments.	NDHHS	Staff Time	2015		Yes	<b>Completed.</b> See comment below.
	<i>Risk-based food inspections have been implemented. Continuing to perform risk-based inspections.</i>						
Infectious Disease	Require bi-monthly water analysis for pools and recommend superchlorination if chlorine levels are observed to be low when collecting water samples.		Staff Time	2015		Yes	<b>Complete</b> See comment below.
	<i>Pools are now required to submit monthly water sampling.</i>						
Infectious Disease	Provide mosquito control & surveillance services.		\$70,000 annual budget estimate	2015		Yes	<b>Complete and On-going</b>

<b>Fire Department</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Fire	Continue to update and enforce zoning, building and fire code regulations.		Staff Time Fire Dept Budget	2015		Yes	<b>Complete</b> and On-going
Fire	Promote (not require) residential fire sprinkler systems to minimize fire risk and vulnerability.		Staff Time	2015		Yes	<b>Complete</b> and On-going
<i>This has not been well received by local developers due to added cost of construction of spec homes. Home builders could share this option with those designing/contracting construction of a custom home.</i>							
Hazmat	Develop preplans specific to hazardous materials fixed facilities.		Staff Time	2015		Yes	<b>Complete</b> and On-going
Wildland Fire	Maintain Wildland Fire-Break Trail in Southwest Bismarck.	Forestry Public Works	Staff Time	2015		Yes	<b>Complete</b> and On-going
Wildland Fire	Update the Wildland Fire Urban Interface risk map annually or as needed based on city annexations.	GIS	Staff Time	2025		Yes	<b>New</b>
Wildland Fire	Share Firewise landscaping concepts with developers and the Planning Department.	Planning	Staff Time	2025		Yes	<b>New</b>
<b>Public Education</b>							
Fire	Provide Fire Safety public education to the community at large.		Staff Time Fire Dept Budget	2015		Yes	<b>Complete</b> and On-going
Hazmat & Train Derailment	Continue Public Education efforts regarding Shelter In Place and Evacuation procedures.	Emergency Management	Dept Budgets Staff Time	2015		Yes	<b>Complete</b> and On-going
<i>Special Populations Considerations: Bismarck State College and occupancies within ½ mile of railroad lines.</i>							
Wildland Fire	Continue to provide for public education efforts, including media releases, interviews, website updates, and public outreach. Public outreach shall include specific mailings to property owners within		Staff Time Fire Dept Budget	2015		Yes	<b>Complete</b> and On-going

<b>Fire Department</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
	the wildland fire risk areas every three years or as applicable based on drought conditions. Public education efforts utilize Firewise program guidance.						
<i>Bismarck Fire is prepared to provide for public education during future drought conditions.</i>							
Wildland Fire	Share Firewise landscaping concepts with developers and the Planning Department.		Staff Time Fire Dept Budget	2015		Yes	<b>Complete and On-going</b>

<b>Forestry</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Pest Infestation	Continue programs to monitor existing and future forest damaging pests.		Staff Time	2015		Yes	<b>Complete</b> and On-going See comment below
<i>Ongoing annual monitoring by seasonal Dutch Elm Disease crew and forestry staff.</i>							
Pest Infestation	Continue existing mitigation efforts including the systematic approach to removing ash trees in decline and replant with a different species to increase the diversity of our urban forest.		Staff Time Public Works / Forestry Budget	2015		Yes	<b>Complete</b> and On-going See comment below
The Forestry Division performs risk assessments annually to aid in identifying declining ash trees. See existing mitigation capabilities within Section 3 of this plan document.							
Pest Infestation	Maintain the “City of Bismarck Emerald Ash Borer Response Plan” developed and approved by the Forestry Advisory Board and the City Commission.		Staff Time Public Works / Forestry Budget	2025	2026	Yes	<b>Complete</b> and On-going
Winter Storm	Downed Power Line Safety Training (Forestry Staff - Internal)		Staff Time Public Works / Forestry Budget	2025		Yes	<b>Complete</b> and On-going
<b>Public Education</b>							
Drought	Provide for community-wide public education relating to landscaping and watering strategies including availability of water analytics, smart irrigation controllers, drought tolerant landscaping, and irrigation rates.	Public Works		2025		Yes	<b>New</b>
Pest Infestation	Continue public education efforts to diversify tree plantings and reduce potential for transporting pests (Pest Infestations) from other areas of the country.		Staff Time	2015		Yes	<b>Complete</b> and On-going See comment below
<i>Ongoing public education efforts through Partners in Planting Program and public outreach.</i>							

<b>Information Technology</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Cyber-Attack	Review Cybersecurity policies and procedures annually.			2025	2030	Yes	<b>*New</b> (Cyberattack hazard added to plan in 2025)
Cyber-Attack	Engage third parties to perform cybersecurity review and establish security goals.			2025	2030	Yes	<b>*New</b> (Cyberattack hazard added to plan in 2025)
Cyber-Attack	Conduct cybersecurity training and tabletop exercises with staff.	All City Depts		2025	2030	Yes	<b>*New</b> (Cyberattack hazard added to plan in 2025)
Cyber-Attack	Maintain internal documentation regarding mitigation goals and action items recommended. Communicate mitigation goals and priority action items internally with appropriate city staff.	City Administration Finance	Varies by project	2025	2030	Yes	<b>*New</b> (Cyberattack hazard added to plan in 2025)
Cyber-Attack	Continue existing mitigation capabilities as listed within Section 3 of this plan document.			2025	2030	Yes	<b>*New</b> (Cyberattack hazard added to plan in 2025)
Cyber-Attack	Promote (internally) the recommended mitigation actions as listed within the Cyberattack hazard profile within Section 9 of this plan document	All City Depts		2025	2030	Yes	<b>*New</b> (Cyberattack hazard added to plan in 2025)

\*Mitigation efforts were in place prior to adding Cyberattack as a hazard to this mitigation plan. The status of “new” in this case is based on the mitigation action items not being included in the previous 2020 plan.

<b>Planning</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Tornado	Update the Land Development Code to ensure space for sirens is reserved during the planning phase of development.	Emergency Management		2025	2026	No	<b>New</b>
Winter Storm and All Hazards	Advocate for and support the development of safe, stable, and affordable housing options for individuals and families.	Public Health & Community Partners		2025	2030		<b>New</b>

<b>Police</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Active Threat	Invest in a real-time crime center and deploy advanced analytics technologies in high-traffic and high-risk areas to support rapid response, crime prevention, and data-driven decision-making.		TBD	2025	2030		<b>New</b>
Active Threat	Continue existing mitigation capabilities as listed in Section 3 of this plan.		Department Budget	2025	2030	Yes	<b>Complete and On-going</b>
Active Threat	Provide for training opportunities in how to plan, prepare, and mitigate potential Active Threat / Active Attack incidents. Promote opportunities internally (city departments) and externally (community). (CRASE: Civilian Response to Active Shooter Events).		Department Budget	2025	2030	Yes	<b>Complete and On-going</b>
Active Threat	Recommendation for city facilities and public/private critical infrastructure entities: Request a site assistance visit from the Bismarck Police Department or the ND State and Local Intelligence Center to facilitate identification of vulnerabilities and identify mitigation options. <a href="#">State Assistance Visit - NDSLIC</a>		Staff Time	2025	2030	Yes	<b>Complete and On-going</b>
Civil Disturbance	Continue preparedness, training, and mitigation activities (mitigation capabilities) as summarized in Section 3 of this plan.		Department Budget	2025	2030	Yes	<b>Complete and On-going</b>
Civil Disturbance	Encourage the state of ND to fund support for civil disturbance teams to facilitate training as well as equipment needs in order to support mitigation, prevention, and response capability.		Staff Time	2025	2030	Yes	<b>Complete and On-going</b>

<b>Police</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Terrorist, or Nation-State Attack	Continue the existing mitigation capabilities as summarized within Section 3 of this plan document.		Department Budget	2025	2030	Yes	<b>New</b>
Terrorist, or Nation-State Attack	Recommendation for city facilities and public/private critical infrastructure entities: Request a site assistance visit from the ND State and Local Intelligence Center to facilitate identification of vulnerabilities and identify mitigation options.		Staff Time	2025	2030	Yes	<b>New</b>
Terrorist, or Nation-State Attack	Share Mitigation Strategies as recommended by the ND State and Local Intelligence Center as a resource for the city, local businesses and citizens. <i>See "Capabilities" within Section 3 of this plan document.</i>		Staff Time	2025	2030	Yes	<b>New</b>

<b>Public Health</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Infectious Disease	Continue Mitigation Capabilities (on-going or routine mitigation activities) as listed in Section 3 of this plan.						<b>Complete and On-going</b>  See note below.
Mitigation Action Items as identified in the 2020 plan have been moved to existing mitigation capabilities within Section 3 of this plan document. See "infectious Disease" within Section 3. Status of all previous mitigation action items is completed and on-going.							
Infectious Disease	Elevate community education campaigns during increased risk of disease. (influenza season).			2025		Yes	<b>New Complete and On-going</b>
Infectious Disease	Engage community partners during disease outbreaks (response action).	Per Public Health EPR response plans		2025		Yes	<b>New Complete and On-going</b>
Winter Storm and All Hazards	Identify and implement coordinated, community-driven solutions to effectively support individuals experiencing homelessness, behavioral health crises, or substance use disorders.  <i>Lead facilitation of the Community Triage Center planning, development, and coordination.</i>	Community		2025	2030		<b>New</b>
Winter Storm and All Hazards	Advocate for and support the development of safe, stable, and affordable housing options for individuals and families.	Planning Dept & Community		2025	2030		<b>New</b>

<b>Public Works</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Dam Failure	Conduct maintenance activities at Jackman Coulee Dam #2 (Tom O’Leary Golf Course) as recommended by the State Water Commission and/or annual inspections conducted by Bismarck Public Works.	PW Utilities	PW Utilities Funding	2015		Yes	<b>Complete and On-going</b>  See comment below
<i>Public Works completes inspections and maintenance annually.</i>							
Flood	Provide protection to the wastewater treatment plant outfall: Place control structures along the wastewater treatment plant outfall near the Tavis structure and the river to protect the wastewater treatment plant from inundation when river levels at Bismarck gage station rise to 13'.		State Water Commission & City of Bismarck 1M	2020	2021		<b>Completed</b>
Flood	Maintain existing flood protective measures to minimize vulnerability as a result of ice jams as well as 100-year and 500-year flood events. Note: Refers to maps Figures 1 through 7) within Section 3 (Mitigation Capabilities).		PW Utility Funding and Staff Time	2012		Yes	<b>Complete and On-going</b>  See comment below
<i>All gates are inspected and operated biannually.</i>							
Flood	Continue Watershed master planning and updating as an on-going mitigation activity conducted jointly by Engineering, Public Works, Planning, and Building Inspections.	Engineering, Planning	Staff Time	2015		Yes	<b>Complete and On-going</b>
Space Weather	Consider EMP shielding devices to protect generators.		Various Mitigation Grants	2025		Yes	<b>New</b>

<b>Public Works</b>							
<b>Hazard</b>	<b>Mitigation Action</b>	<b>Support Agencies</b>	<b>Potential Funding Source / Est. Cost</b>	<b>Timeline Initiate</b>	<b>Timeline Complete</b>	<b>On-going</b>	<b>Status as of 2025</b>
Tornado	Include a Tornado Safe Room to EF4 standards within any new construction of city owned critical facilities where applicable based on occupancy.	Public Works Facility Mgmt	Project Specific	2015		Yes	<b>Complete and On-going</b>
<i>Recent Facilities: CenCom/Emergency Operations Center Facility and Fire Station #4 included Tornado Safe Rooms construction.</i>							
Tornado	Ensure NOAA All Hazards Weather Radios are located in all city owned buildings.	Facilities Mgmt. Emergency Mgmt	Individual City Departments \$50 per radio	2015	2030	Yes	<b>Progressing</b>
Winter Storm	Identify critical facilities and infrastructure having or needing back-up generators or upgrades.		Staff Time	2015	2030	Yes	<b>Complete and On-going</b>
Winter Storm	Ensure back-up generators are in place at all city-owned Critical Facilities. Ensure the back-up generators allow for continued operations of critical and essential functions.		TBD based on generator needs	2015	2030	Yes	<b>Complete and On-going</b>
<i>Recent facilities: CenCom/Emergency Operations Center Facility, Fire Station #4, and Public Health facilities have established generator capability.</i>							
Winter Storm	Evaluate need and opportunity for snow fences.		Staff Time	2015		Yes	<b>Complete and On-going</b>
<b>Public Education</b>							
Drought	Provide for community-wide public education relating to landscaping and watering strategies including availability of water analytics, smart irrigation controllers, drought tolerant landscaping, and irrigation rates.	Forestry		2025		Yes	<b>New</b>
Winter Storm & Geologic Hazard	Do NOT stockpile snow (or other material) within any geological sensitive areas.	Engineering	Staff Time Dept Budget	2015		Yes	<b>Complete and On-going</b>

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# Mitigation Actions – Prioritizing

New and existing mitigation action items are scored using the “STAPLEE” criteria as outlined below and prioritized based on several considerations listed within the table on the next page. Scoring and prioritizing is initiated by Bismarck Emergency Management and reviewed by those identified as Lead Planners per hazard. During the final stages of planning, Mitigation Plan Update Steering Committee members are provided opportunity to review and comment.

It's important to note that completion of mitigation action items is not sequential based on priority level, but depends on various factors including available resources, seasonal priorities and limitations, funding, and potential coordination requirements with community partners, etc.

Public Education mitigation actions are integrated into position job descriptions within various departments and are generally on-going or routine activities. These mitigation actions are grouped as “Public Education” rather than ranked as high, moderate, or low. However, they are listed based on the hazard ranking.

<b>STAPLEE Criteria</b>	
<b>Criteria</b>	<b>Considerations</b>
<b>Social</b>	Community Acceptance Effects on Segment of Population
<b>Technical</b>	Technical Feasibility Long-Term Solution Secondary Impacts
<b>Administrative</b>	Staffing Funding Allocated Maintenance/Operations
<b>Political</b>	Political Support Local Champion or Proponent Public Support
<b>Legal</b>	Local Authority Subjectivity to Legal Challenges
<b>Economic</b>	Benefit of Action Cost of Action Contribution to Economic Goals Outside Funding Requirement
<b>Environmental</b>	Effects on Land/Water Bodies Effects on Endangered Species Effects on Hazardous Material and Waste Sites Consistency with Community Environmental Goals Consistency with Federal Laws
Source (STAPLEE): Federal Emergency Management Agency	
STAPLEE Scoring Criteria: 1= highly effective, feasible 0= Neutral -1 = Ineffective or not feasible	

<b>Mitigation Action Item Prioritizing</b>			
The STAPLEE score in conjunction with additional considerations below were applied to determine the ranking for each mitigation action item.			
<b>High</b>	<b>Moderate</b>	<b>Low</b>	<b>Deny</b>
<ul style="list-style-type: none"> <li>Needs attention or participation from department heads, authorities, officials</li> <li>Requires Funding support (ie: grants)</li> <li>Required to address significant vulnerability</li> <li>Needs urgent attention (not necessarily short term completion)</li> <li>Higher hazard rank</li> </ul>	<ul style="list-style-type: none"> <li>Other entities have lead role – Bismarck is supporting role in mitigation</li> <li>Not fully within city authority – but city voice may be effective</li> </ul>	<ul style="list-style-type: none"> <li>Routine or part of city position job description</li> <li>Can be completed by one individual – minimal coordination</li> <li>Minimal funding challenges</li> <li>On-going / routine mitigation</li> </ul>	<ul style="list-style-type: none"> <li>Not effective (ie: not likely to meet cost/benefit ratio of 1:1)</li> <li>Not feasible, or practical – or may have other more effective solutions</li> </ul>

Note: All Mitigation Action items are important, regardless of ranking of high, moderate or low. “Low” priority mitigation action items are important mitigation action items. Also, the rank does not imply a sequence or priority order for initiating or completing mitigation action items.

### Mitigation Action “STAPLEE” Evaluation and Priority Level

Hazard	Hazard Ranking	Mitigation Action											Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Score		
Winter Storm	High	Coordinate school/city/business closure communications/decisions.											Administration	High
		1	1	1	1	1	1	1	1	1	0	1		
Winter Storm	High	Downed Power Line Safety Training (Forestry Staff – Internal)											Forestry	High
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Ensure back-up generators are in place at all city-owned Critical Facilities. Ensure the back-up generators allow for continued operations of critical and essential functions.											Public Works	High
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Evaluate need and opportunity for snow fences.											Public Works	High
		1	0	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Implement City Office closure policy based on imminent or current conditions.											Administration	High
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Identify critical facilities and infrastructure having or needing back-up generators or upgrades.											Public Works Facilities Mgmt	High
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm & All Hazards	High	Identify and implement coordinated, community-driven solutions to effectively support individuals experiencing homelessness, behavioral health crises, or substance use disorders. <i>Lead facilitation of the Community Triage Center planning, development, and coordination.</i>											Public Health	High
		1	0	1	1	0	0	1	1	1	1	1		
Winter Storm & All Hazards	High	Advocate for and support the development of safe, stable, and affordable housing options for individuals and families.											Planning & Public Health	High
		1	1	1	1	1	1	1	1	1	1	1		

Hazard	Hazard Ranking	Mitigation Action											Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Score		
Tornado	High	Include a Tornado Safe Room to EF4 standards within any new construction of city-owned critical facilities where applicable based on occupancy.											Public Works Facility Mgmt	High
		1	1	0	1	1	1	1	1	1	0	1		
Tornado	High	Update the Land Development Code to ensure space for sirens is reserved during the planning phase of development.											Planning	High
		1	1	1	1	1	1	1	1	1	1	1		
Cyber-attack	High	Review Cybersecurity policies and procedures annually.											Information Technology	High
		1	1	1	1	1	1	1	1	1	1	1		
Cyber-attack	High	Engage third parties to perform cybersecurity review and establish security goals.											Information Technology	High
		1	1	1	1	1	1	1	1	1	1	1		
Cyber-attack	High	Conduct cybersecurity training and tabletop exercises with staff.											Information Technology	High
		1	1	1	1	1	1	1	1	1	1	1		
Cyber-attack	High	Maintain internal documentation regarding mitigation goals and action items recommended. Communicate mitigation goals and priority action items internally with appropriate city staff.											Information Technology	High
		1	1	1	1	1	1	1	1	1	1	1		
Cyber-attack	High	Continue existing mitigation capabilities as listed within Section 3 of this plan document.											Information Technology	High
		1	1	1	1	1	1	1	1	1	1	1		
Cyber-attack	High	Promote (internally) the recommended mitigation actions as listed within the Cyberattack hazard profile within Section 9 of this plan document											Information Technology	High
		1	1	1	1	1	1	1	1	1	1	1		
Flood	Moderate	Maintain existing flood protective measures to minimize vulnerability as a result of ice jams as well as 100-year and 500-year flood events. Note: Refers to maps (Figures 1 thru 5) within "existing mitigation"											Public Works	High
		1	1	1	1	1	1	1	1	1	1	1		

Hazard	Hazard Ranking	Mitigation Action										Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental		
Flood	Moderate	South Bismarck Flood Control Mitigation Project: Reconstruct the South Washington Street Closure Structure (gate) and add a pump station at this location. And modify (widen) the drainage ditch in south Bismarck to enhance flood control and to assist in meeting FEMA requirements for flood protection certification.										Engineering	High
		1	1	1	1	1	1	1	1	1	1		
Train Derailment	Moderate	Locate new critical facilities at least ¼ mile away from railroad lines: a. When building new or relocating critical facilities, the City of Bismarck should provide additional consideration or preference for location options at least ¼ mile from either railroad line. Assuming there are viable location options at least ¼ mile from the railroad lines of equal value and functionality, locating critical facilities at least ¼ mile away would reduce the loss potential.										Administration	High
		1	1	1	1	1	1	1	1	1	1		
Infectious Disease	Moderate	Require bi-monthly water analysis for pools and recommend superchlorination if chlorine levels are observed to be low when collecting water samples.										Environmental Health	High
		1	0	1	1	1	1	1	1	1	1		
Infectious Disease	Moderate	Provide education when conducting food service inspections.										Environmental Health	High
		1	0	1	1	1	1	1	1	1	1		
Infectious Disease	Moderate	Provide mosquito control & surveillance services.										Environmental Health	High
		1	0	1	1	1	0	1	1	0	0		
Fire	Low	Promote (not require) residential fire sprinkler systems to minimize fire risk and vulnerability.										Fire	High
		1	1	1	0	1	1	0	1	1	1		
Geologic	Low	Continue to include recommendations regarding development control lines in geological sensitive areas as future planning is done.										Engineering	High
		0	1	1	1	1	1	0	1	1	1		
Tornado	High	Ensure NOAA All Hazards Weather Radios are located in all city owned buildings.										Public Works Facilities Mgmt	Moderate
		1	1	1	1	1	1	1	1	1	0		

Hazard	Hazard Ranking	Mitigation Action										Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental		
Flood	Moderate	Continue Watershed master planning and updating as an on-going mitigation activity conducted jointly by Engineering, Public Works, Planning, and Building Inspections.										Public Works	Moderate
		1	1	1	1	1	1	1	1	1	1		
Flood	Moderate	Conduct maintenance activities at Jackman Coulee Dam #2 (Tom O’Leary Golf Course) as recommended by the State Water Commission and/or annual inspections conducted by Bismarck Public Works.										Public Works	Moderate
		1	1	1	1	1	1	1	1	1	1		
Flood	Moderate	Bismarck is currently rated at Class 7 within the Community Rating System. Continue annual re-certifications to sustain the CRS program.										Emergency Management & Building Inspections	Moderate
		1	1	1	1	1	1	1	1	1	1		
Fire	Low	Continue to update and enforce zoning, building and fire code regulations.										Fire	Moderate
		1	1	1	1	1	1	0	1	1	1		
Winter Storm	High	Public Information and Warnings (via NWS)										Emergency Management	Low
		1	1	1	1	1	1	1	1	1	1		
Hazmat	Moderate	Develop preplans specific to hazardous materials fixed facilities.										Fire	Low
		1	1	1	1	1	1	1	1	1	1		
Active Threat	Moderate	Invest in a real-time crime center and deploy advanced analytics technologies in high-traffic and high-risk areas to support rapid response, crime prevention, and data-driven decision-making.										Police	High
		1	1	1	1	1	1	1	1	1	1		
Active Threat	Moderate	Continue existing mitigation capabilities as listed in Section 3 of this plan.										Police	Low
		1	1	1	1	1	1	1	1	1	1		

Hazard	Hazard Ranking	Mitigation Action										Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental		
Active Threat	Moderate	Provide for training opportunities in how to plan, prepare, and mitigate potential Active Threat / Active Attack incidents. Promote opportunities internally (city departments) and externally (community). (CRASE: Civilian Response to Active Shooter Events).										Police	Moderate
		1	1	1	1	1	1	1	1	1	1		
Active Threat	Moderate	Recommendation for city facilities and public/private critical infrastructure entities: Request a site assistance visit from the Bismarck Police Department or the ND State and Local Intelligence Center to facilitate identification of vulnerabilities and identify mitigation options.										Police	High
		1	1	1	1	1	1	1	1	1	1		
Civil Disturbance	Moderate	Continue preparedness, training, and mitigation activities (mitigation capabilities) as summarized in Section 3 of this plan.										Police	Low
		1	1	1	1	1	1	1	1	1	1		
Civil Disturbance	Moderate	Encourage the state of ND to fund support for civil disturbance teams to facilitate training as well as equipment needs in order to support mitigation, prevention, and response capability.										Police	High
		1	1	1	1	1	1	1	1	1	1		
Terrorist, or Nation-State Attack	Low	Continue the existing mitigation capabilities as summarized within Section 3 of this plan document.										Police	Low
		1	1	1	1	1	1	1	1	1	1		
Terrorist, or Nation-State Attack	Low	Recommendation for city facilities and public/private critical infrastructure entities: Request a site assistance visit from the ND State and Local Intelligence Center to facilitate identification of vulnerabilities and identify mitigation options.										Police	High
		1	1	1	1	1	1	1	1	1	1		
Terrorist, or Nation-State Attack	Low	Share Mitigation Strategies as recommended by the ND State and Local Intelligence Center as a resource for the city, local businesses and citizens. See <i>“Capabilities” within Section 3 of this plan document.</i>										Police	High
		1	1	1	1	1	1	1	1	1	1		

Hazard	Hazard Ranking	Mitigation Action										Lead	Priority	
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental			Score
Infectious Disease	Moderate	Continue Mitigation Capabilities (on-going or routine mitigation activities) as listed in Section 3 of this plan.										Public Health	Low	
		1	1	1	1	1	1	1	1	1	1	10		
Infectious Disease	Moderate	Elevate community education campaigns during increased risk of disease. (influenza season).										Public Health	High	
		1	1	1	1	1	1	1	1	1	1	10		
Infectious Disease	Moderate	Engage community partners during disease outbreaks (response action).										Public Health	High	
		1	1	1	1	1	1	1	1	1	1	10		
Pest Infestation	Low	Continue programs to monitor existing and future forest damaging pests.										Forestry	Low	
		0	1	1	1	1	1	1	1	1	1	9		
Pest Infestation	Low	Continue existing mitigation efforts including the systematic approach to removing ash trees in decline and replant with a different species to increase the diversity of our urban forest.										Forestry	Low	
		0	1	1	1	1	1	1	1	1	1	9		
Pest Infestation	Low	Maintain the "City of Bismarck Emerald Ash Borer Response Plan" developed and approved by the Forestry Advisory Board and the City Commission.										Forestry	Low	
		0	1	1	1	1	1	1	1	1	1	9		
Dam Failure	Low	Locate new critical facilities outside inundation area when possible: When building, remodeling, or relocating critical facilities, the City of Bismarck should provide additional consideration or preference for location options outside of the dam failure inundation area. Because the probability of a catastrophic dam failure is very low, locating critical facilities outside the inundation area is NOT a requirement. However, assuming there are viable location options outside of the inundation area of equal value and functionality, locating outside the inundation area would reduce the loss potential.										Administration	Low	
		1	1	1	1	1	1	1	1	1	1	10		

Hazard	Hazard Ranking	Mitigation Action										Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental		
Aircraft Accident	Low	Maintain the current airport hazard mitigation and emergency response plans and planning efforts identified as existing mitigation Capabilities within Section 3 of this plan document.										Airport	Low
		1	1	1	1	1	1	1	1	1	1		
Aircraft Accident	Low	Recommend Burleigh County and city of Lincoln adopt city of Bismarck aeronautical zoning where applicable based on the city of Lincoln growing nearer to the Airport.										Airport	Moderate
		1	1	1	1	1	0	0	1	1	1		
Aircraft Accident	Low	Update the Wildlife Hazard Assessment.										Airport	Low
		1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Update the Wildland Fire Urban Interface risk map annually or as needed based on city annexations.										Fire	Low
		1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Share Firewise landscaping concepts with developers and the Planning Department.										Fire	Low
		1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Maintain Wildland Fire-Break Trail in Southwest Bismarck.										Fire	Low
		1	1	1	1	1	1	1	1	1	1		
Space Weather	Low	Develop a communication plan strategy. <i>Communicate the possibility of such an unavoidable event and ensure there are effective communication strategies in place for before, during and after an event. Identify the appropriate scale (trigger point) to use for purposes of informing the public of potential impacts. Coordinate with NWS and Space Weather Prediction Center personnel.</i>										Emergency Management	Low
		1	1	1	1	1	1	1	1	1	1		
Space Weather	Low	Consider EMP shielding devices to protect generators.										Public Works Facility Management	Low
		1	1	0	1	0	1	1	1	0	0		

## Public Education Mitigation Activities

Hazard	Hazard Ranking	Mitigation Action											Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Score		
All Hazards	High	Automatic Notification System (CodeRED) – promote opt-in based on new platform.											CenCom & Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm & All Hazards	High	Coordinate public education efforts with local schools and local entities (non-profit organizations) serving as liaisons to newcomers and other vulnerable population groups.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Public Education (on-going) - emphasis on dangers of downed power lines and utilizing alternate work start/stop times to minimize rush hour traffic.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Participate in the Severe Winter Weather Awareness Campaign (on-going).											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Winter Storm	High	Coordinate public education efforts with internal and local entities (non-profit organizations) serving as liaisons to newcomers who may not be familiar with ND winters.											Administration	Public Education
		1	1	1	1	1	0	1	1	1	1	1		
Tornado	High	Promote shelter pre-planning at the individual and worksite levels to include recommendations to take shelter during a tornado watch and avoid tendencies to relocate during a tornado warning.											Emergency Management	Public Education
Tornado	High	Public Information - NWS Warnings (existing mitigation capability)											National Weather Service	Public Education
		1	0	1	1	1	1	1	1	1	1	1		
Tornado	High	Encourage Wind-Resistant Building Techniques											Building Inspections	Public Education
		1	1	1	1	1	1	1	1	1	1	1		

Hazard	Hazard Ranking	Mitigation Action											Lead	Priority	
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Score			
Tornado & All Hazards	High	Promote the NOAA All Hazards Weather Radio – for all homes and businesses to consider as a primary indoor or portable system for receiving alerts/warnings.											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Tornado	High	Protect property from high winds (FEMA website) <a href="http://www.fema.gov/media-library/assets/documents/13270?id=3263">http://www.fema.gov/media-library/assets/documents/13270?id=3263</a>											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Tornado	High	Safe Room Construction Design for property owners (public education) <a href="http://www.fema.gov/media-library/assets/documents/2009?fromSearch=fromsearch&amp;id=1536">http://www.fema.gov/media-library/assets/documents/2009?fromSearch=fromsearch&amp;id=1536</a>											Emergency Management	Public Education	
		1	0	1	1	1	1	0	1	0	0	0	6		
Tornado	High	Continue participating in the Severe Summer Weather Awareness campaign.											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Winter Storm	High	Recommended minimum of 3-day emergency supplies – recommend enhancing preparedness to 1 or 2 weeks of power loss.											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Severe Summer Weather	Moderate	Extreme Heat: Do not leave children or pets in the unattended vehicle.											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Severe Summer Weather	Moderate	Continue participating in the Severe Summer Weather Awareness campaign.											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Flood	Moderate	Coordinate and/or support NFIP flood insurance promotional efforts including the availability of flood insurance for community residents and businesses.											Building Inspections	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Flood	Moderate	Provide for Flood Mitigation and Preparedness Public Education efforts for local citizens and businesses. (via website content and public presentations upon request).											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		
Flood & Dam Failure	Moderate	Promote the purchase of flood insurance (National Flood Insurance Program) – community wide.											Emergency Management	Public Education	
		1	1	1	1	1	1	1	1	1	1	1	10		

Hazard	Hazard Ranking	Mitigation Action											Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Score		
Hazmat	Moderate	Continue Public Education regarding Shelter In Place and Evacuation procedures											Fire & Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Train Derailment	Moderate	Evacuation and Shelter-In-Place Emergency Preparedness.											Fire & Emergency Management	Public Education
		1	0	1	1	1	1	1	1	1	1	1		
Fire	Low	Provide Fire Safety public education to the community at large.											Fire	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Geologic	Low	Identify opportunities to inform or remind property owners of property related information regarding potential geologic conditions that may impact them or their property.											Engineering	Public Education
		0	1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Share Air Quality Information alerts when disseminated by the ND Department of Environmental Quality, along with applicable Shelter In Place recommendations. <a href="https://deq.nd.gov/AQ/monitoring/">https://deq.nd.gov/AQ/monitoring/</a>											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Provide "AirNow" air quality information via the city's website within Emergency Management web pages. <a href="#">Interactive Map of Air Quality</a>											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Continue to provide for public education efforts, including media releases, interviews, website updates, and public outreach. Public outreach shall include specific mailings to property owners within the wildland fire risk areas every three years or as applicable based on drought conditions. Public education efforts utilize Firewise program guidance.											Fire	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Wildland Fire	Low	Share Firewise landscaping concepts with developers and the Planning Department.											Fire	Public Education
		1	1	1	1	1	1	1	1	1	1	1		

Hazard	Hazard Ranking	Mitigation Action											Lead	Priority
		Life Safety	Property Protection	Benefit vs. Cost	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Score		
Drought	Low	Provide for community-wide public education relating to landscaping and watering strategies including availability of water analytics, smart irrigation controllers, drought tolerant landscaping, and irrigation rates.											Public Works & Forestry	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Pest Infestation	Low	Continue public education efforts to diversify tree plantings and reduce potential for transporting pests (Pest Infestations) from other areas of the country.											Forestry	Public Education
		0	1	1	1	1	1	1	1	1	1	1		
Geologic and Winter Storm	Low	Do Not stockpile snow (or other material) within any geological sensitive areas.											Public Works	Public Education
	High	0	1	1	1	1	1	1	1	1	1	1		
Dam Failure	Low	Establish Awareness (public education) of the potential impact of Heart Butte Dam.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Dam Failure	Low	Support public awareness efforts relating to planned maintenance and repair projects relating to the Garrison Dam as well as the Heart Butte Dam.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Dam Failure	Low	Participate in Heart Butte Dam emergency action plan reviews.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
Space Weather	Low	Enhance the Emergency Management Website to include Space Weather to enhance awareness of potential impact, including communications challenges.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		
All Hazards	High	Promote mitigation and emergency preparedness for all hazards.											Emergency Management	Public Education
		1	1	1	1	1	1	1	1	1	1	1		

The following Mitigation Action Items from the 2020 Multi-Hazard Mitigation Plan have been removed from the listed Mitigation Action items for the 2025 plan update. The column on the right provides the reason.

<u>Hazard</u>	<u>2020 Mitigation Action Items Removed</u>	<u>Lead Agency</u>	<u>Reason</u>
Tornado	Replace outdoor warning siren activation controller system.	Emergency Management	<b>Completed</b>
Tornado	Explore potential for developing a city ordinance to require tornado shelter construction at any newly developed mobile home parks and encourage construction absent city ordinance.  Note: If a new manufactured home is anchored to a frost-protected foundation system in accordance with the manufacturers installation requirements it would likely be as resilient to wind damage as a conventionally framed home that has been constructed in accordance with the International Residential Code (IRC). Also, new mobile home parks have not been established in Bismarck within the last 20 years.	Emergency Management	Removed See note at left below the mitigation item.
Flood	Provide protection to the wastewater treatment plant outfall: Place control structures along the wastewater treatment plant outfall near the Tavis structure and the river to protect the wastewater treatment plant from inundation when river levels at Bismarck gage station rise to 13'.	Public Works	<b>Completed</b> and listed as a Mitigation Capability in Section 3
Shortage or Outage of Critical Materials	Identify critical facilities and infrastructure having or needing back-up generators or upgrades (ie: critical facilities and shelter locations). Gap Analysis  Note: Shortage or Outage of Critical Materials is not included as a separate hazard within this plan update.	Public Works	Transferred to Winter Storm Hazard. Continue.
Shortage or Outage of Critical Materials	Ensure back-up generators are in place at all city-owned Critical Facilities. Ensure the back-up generators allow for continued operations of critical and essential functions.  Note: Shortage or Outage of Critical Materials is not included as a separate hazard within this plan update.	Public Works	Transferred to Winter Storm Hazard. Continue.
Train Derailment	Clarify bridge ownership and responsibilities for maintenance and inspections.  7 <sup>th</sup> and 9 <sup>th</sup> Street locations railroad overpasses are BNSF ownership. DOT in concert with the FRA inspects the structures on a three-year rotation.		<b>Completed</b> See comment at left.
Geologic	Develop a remediation to buttress the active geological slide occurring on River Road north of I94 Grant Marsh Bridge.	Engineering	<b>Completed</b> and listed as a Mitigation Capability in Section 3

<u>Hazard</u>	<b><u>2020 Mitigation Action Items Removed</u></b>	<u>Lead Agency</u>	<b><u>Reason</u></b>
Civil Disturbance	Bismarck Police Department staff meet with event organizers (primary points of contact) prior to events to learn of event size (expected total participants), event location, time and date and other event specifics. A permitting process is established and permits are encouraged to be completed, but cannot be mandated based on United States case law.	Police	Listed as an existing Mitigation Capability in Section 3. (routine)
Infectious Disease	Identify appropriate locations for isolation or quarantine.	Public Health	All are completed and are listed within Section 3 as existing Mitigation Capabilities.
Infectious Disease	Increase Immunizations rates through grants opportunities and QI projects.	Public Health	
Infectious Disease	Increased opportunities to receive Hepatitis B vaccine to high risk individuals.	Public Health	
Infectious Disease	Engage and support local healthcare providers in an active preparedness coalition.	Public Health	
Infectious Disease	Sterilization of foot care equipment with an autoclave to decrease spread of Infectious Disease.	Public Health	
Infectious Disease	Continue Existing Mitigation Efforts (BBPH)	Public Health	
Infectious Disease	Assess willingness among local health care providers to work collaboratively to address bacterial resistance and anti-biotic stewardship.	Public health	
Infectious Disease	Ongoing education of staff for better response to an outbreak.	Public Health	
Infectious Disease	Provide website and social media means to educate the public during an event.	Public Health	
Infectious Disease	Provide breastfeeding education to increase breastfeeding in the community for higher rates of baby immunity.	Public Health	
Infectious Disease	Provide Narcan training opportunities to the community to help with the emerging substance abuse threat.	Public Health	

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# Integration of Plans and Programs & Mitigation Capabilities Inventory

This section provides a summary of community mitigation capabilities and identifies the plans, programs, and other capabilities integrated throughout the development of this mitigation plan. Additional capabilities specific to each hazard are identified within Section 3 of the Multi-Hazard Mitigation Plan.

City Administration will coordinate with the applicable city department to integrate the mitigation plan goals into other plans and funding mechanisms (ie: annual budgeting process, capital improvement program, growth management plan, future land use plan, plat review process, site plan review process) where appropriate.

<b>Plans and Programs</b>	
Plans and programs reviewed and incorporated into the mitigation plan or mitigation planning process are noted below. This updated 2025 Multi-Hazard Mitigation Plan will be used to inform these mechanisms.	
<b>Bismarck Strategic Plan</b>	The City of Bismarck developed a Strategic Plan identifies the community’s Vision, Mission, and Values as well as numerous goals and objectives relating to seven focus areas: Infrastructure and Development, Economic Vitality, Safety and Healthy Community, Emerging Issues, Engaged and Informed Community, Desirable Lifestyle, and Organizational Excellence. The City of Bismarck is available via the city’s website, allowing the public to monitor goals and goal status.
<b>Together 2045 – Bismarck’s Comprehensive Plan</b>	<p>The Bismarck Comprehensive Plan (Together 2045) was completed in 2022 and is revised periodically . Goal #16 within the plan states “Build community resilience to prepare for, respond to, withstand, and recover from natural disasters.” Several objectives are identified under goal #16, relating to floods, drought, winter storms, and general hazard mitigation.</p> <p>The Future Land Use Plan in the Comprehensive Plan utilizes areas of potential hazard, including floodplains and steep slope, to assign suitable future growth areas and zoning.</p> <p>The Major Street Plan displays future major streets to facility orderly development of outward growth and internal connections necessary for street connectivity. The Active Mobility Plan shows future shared use paths.</p> <p><a href="https://www.bismarcknd.gov/DocumentCenter/View/41634/Together-2045-Comprehensive-Plan?bidld=">https://www.bismarcknd.gov/DocumentCenter/View/41634/Together-2045-Comprehensive-Plan?bidld=</a></p>

<b>Plans and Programs</b>	
Plans and programs reviewed and incorporated into the mitigation plan or mitigation planning process are noted below. This updated 2025 Multi-Hazard Mitigation Plan will be used to inform these mechanisms.	
<b>Bismarck Emergency Operations Plan</b>	The hazard profiles (ie: risk and vulnerability assessment components) contained with this mitigation plan may be referenced to enhance the Emergency Operations Plan and department specific standard operating guides/procedures. The Emergency Operations Plan informs the mitigation planning development through reviews of the Emergency Operations Plan which may identify response capability gaps and opportunities for mitigation.
<b>Bismarck Continuity of Operations Plan</b>	Plan update in progress.
<b>Stormwater Management Program</b>	Bismarck has a Stormwater Management Program implemented jointly by Planning, Engineering, and Public Works and includes a Stormwater Program Coordinator within the Public Works Department. Mitigation capabilities of the Stormwater Management program are identified through Planning via City Ordinance Title 14.1 (Zoning Ordinance). The city has authority to regulate and enforce stormwater management requirements to promote health, safety, and welfare of the people and property within Bismarck and its extraterritorial jurisdiction. The requirements, permitting and detailed review process are in place to mitigate the impacts of development and land disturbance, protect natural resources, maintain water quality, and minimize stormwater runoff, erosion, and urban flooding issues. More Information: <a href="http://www.bismarcknd.gov/index.aspx?nid=190">http://www.bismarcknd.gov/index.aspx?nid=190</a>
<b>Bismarck Airport Master Plan and Airport Mitigation and Response Plans</b>	The Bismarck Airport through its various plans and manuals has specific guidelines and procedures for mitigating hazards. The plans include but are not limited to: Airport Certification Manual, Airport Emergency Plan, Airport Security Program, Spill Prevention Control and Countermeasure Plan (SPCC), Wildlife Hazard Management Plan, Wetland Mitigation and Environmental Assessments. The airport in on-going operations strives to ensure safety and security and mitigate any hazards that could arise. By following procedures set forth, continuous retraining and improvements the airport mitigates hazards.
<b>Public Health Programs</b>	Public Health programs include Emergency Preparedness and Response, Home Health Services, Disease Prevention and Control, Women’s Way, Environmental Health and other health services. Bismarck also provides public health services to Burleigh County (via contract).
<b>Board of Health</b>	The board of city commissioners constitutes the City Board of Health. <i>Reference: N.D.C.C. 23-35-03. (Ord. 5660, 05-13-08)</i>
<b>Emergency Operations Center (EOC) Facility</b>	The City of Bismarck and Burleigh County, in partnership with Dakota Carrier Network (DCN) built the public safety communications center and emergency operations center connected to the DCN facility. The

<b>Plans and Programs</b> Plans and programs reviewed and incorporated into the mitigation plan or mitigation planning process are noted below. This updated 2025 Multi-Hazard Mitigation Plan will be used to inform these mechanisms.	
	DCN addition (CenCom and EOC) is hardened, built to withstand natural and manmade disasters and to ensure maximum uptime in the most adverse conditions. The facility construction was completed in the fall of 2020.
<b>Central Dakota Communications Center (CenCom)</b>	In 2016, the City of Mandan joined with the City of Bismarck and Burleigh County and reorganized into the Central Dakota Communications Center, serving Bismarck, Mandan, Burleigh County and the SE portion of McLean County to include the City of Wilton. This has enabled better information sharing and coordination amongst agencies. It has reduced the necessity of transferring calls, resulting in a more efficient response in the served communities.
<b>Statewide Interoperable Radio Network (SIRN)</b>	SIRN has begun implementation in 2019 with the CenCom coverage area included in the early adopter buildout for 2020. This provides for better coverage, interoperability and in-building communications within a system built to leverage new technology over the next 20-25 years.
<b>Transportation Improvement Program (TIP)</b>	The annually developed Transportation Improvement Program (TIP), produced by the Bismarck-Mandan Metropolitan Planning Organization (MPO), identifies federally funded transportation improvements in the area over a four year time frame. The TIP is developed on an annual basis in cooperation with the MPO area member jurisdictions, transit provider, and the North Dakota Department of Transportation. The MPO utilizes its Public Participation Plan and coordinates the TIP with its Long Range Transportation Plan (LRTP). <a href="https://www.bismarcknd.gov/1109/Transportation-Improvement-Program">https://www.bismarcknd.gov/1109/Transportation-Improvement-Program</a>
<b>Metropolitan Transportation Plan (MTP)</b>	<p>The 2025-2050 Metropolitan Transportation Plan (MTP) is the long range transportation plan for the MPO area. It is a guide for the development of the area's transportation system over the next 20+ years. The MTP is required by federal regulations to be updated once every five years in order for the Bismarck-Mandan area to be eligible for federal transportation dollars for transportation improvements. The updates allow the MPO jurisdictions an opportunity to re-examine their values related to transportation, as well as provide an opportunity for the area to consider how their transportation system should look and function in the future.</p> <p>The MTP addresses transportation system needs and provides a set of methods, strategies, and actions for developing an integrated multi-modal transportation system that supports the efficient movement of people and goods. The MTP considers all relevant modes of transportation in the area including</p>

<b>Plans and Programs</b>	
Plans and programs reviewed and incorporated into the mitigation plan or mitigation planning process are noted below. This updated 2025 Multi-Hazard Mitigation Plan will be used to inform these mechanisms.	
	pedestrians, bicyclists, automobile drivers, transit users, and freight shippers. <a href="https://www.bismarcknd.gov/1226/Metropolitan-Transportation-Plan-MTP">https://www.bismarcknd.gov/1226/Metropolitan-Transportation-Plan-MTP</a>
<b>Consolidated Plan</b>	The 2025-2030 Consolidated Plan identifies the city’s housing and community development needs, priorities, goals, and strategies – and strategizes how federal funds, especially the Community Development Block Grant, will be allocated to meet these needs. A section (MA-65) of the Consolidated Plan addresses hazard mitigation activities, especially for vulnerable populations and low-to-moderate income households. The Consolidated Plan is developed by the Bismarck’s Planning Department.
<b>Capital Improvement Program</b>	The Capital Improvement Program is managed by the Finance Department. A department may place capital improvement projects over \$50,000 (for non-special assessment district projects) on the Capital Improvement Plan which are evaluated by the Budget Committee. The Budget Committee makes recommendations to the City Commission regarding approvals/adjustments to the Capital Improvement 5-year and annual plans. The City Commission adopts the 5 year plan and approves the annual plan. Projects under \$50,000.00 follow the purchasing ordinance. The Engineering Department may submit a request to the City Commission to create a special assessment district to assess benefiting properties. The city commission calls for a public hearing regarding those projects.
<b>State and County Mitigation Plans</b>	The 2024-2029 State of North Dakota Enhanced Mitigation Plan and the Burleigh and Morton County Multi-Hazard Mitigation Plans were reviewed by Bismarck Emergency Management and integrated into this plan and planning process.
<b>Missouri River 2024 Flood Response and Action Plan</b>	The Missouri River 2024 Flood Response and Action Plan is integrated into the Bismarck Multi-Hazard Mitigation Plan. The plan addresses both Ice Jam and Flood protection.
<b>Cyber Response Plan</b>	Bismarck IT, via support from the Paragon Policy Program, completed the city’s cyber response plan (September 2025).

<b>Codes, Permitting and Inspections</b> The following mitigation capabilities are reviewed and incorporated into the mitigation plan and planning process.	
<b>Building Ordinance and Codes</b>	<p>The Building Inspections Department enforces various building codes per Title-4 Building Ordinance. The building codes ensure construction standards to address life safety and quality construction issues. The ordinance establishes processes for permitting and inspections managed by the Building Inspections Department. The jurisdiction of the division includes Bismarck and Burleigh ETA mapped :  <a href="https://bismarck.maps.arcgis.com/home/webmap/viewer.html?webmap=d714ee6df3254526902e66baa926c42e">https://bismarck.maps.arcgis.com/home/webmap/viewer.html?webmap=d714ee6df3254526902e66baa926c42e</a></p> <p>More information: <a href="https://www.bismarcknd.gov/DocumentCenter/View/151/Title-04---Building-Regulations?bidld=">https://www.bismarcknd.gov/DocumentCenter/View/151/Title-04---Building-Regulations?bidld=</a></p> <p>It is anticipated that building codes will be updated in 2026.</p>
<b>Fire Codes</b>	<p>The Bismarck Fire Department enforces Fire Codes per Title-4 Building Ordinance in cooperation with the Building Inspections and Planning Departments. The Fire Department issues permits for licensed daycare facilities, exhaust hood system installations, sprinkler systems, fire alarm systems, and professional firework displays. Bismarck Fire conducts annual inspections of all commercial and public facilities to ensure sustained compliance with fire codes and to promote safety and mitigation practices. Within the incorporated limits of the City of Bismarck, the ISO Public Protection Classification is 1.</p> <p>More information: <a href="https://bismarcknd.gov/479/Permits-Code-Compliance">https://bismarcknd.gov/479/Permits-Code-Compliance</a></p>

<b>Land Use Planning and Ordinances</b> The following land use planning capabilities and ordinances are incorporated into the mitigation plan or planning process.	
<b>Zoning</b>	<p>Zoning authorities are established by Bismarck City Ordinance Title 14. The zoning ordinance provides for the concept of a “Master Plan” which is a compilation of adopted street, road, land use, water, sanitary sewer and drainage plans. The Planning Division administers land use regulations and coordinates the development application process for <a href="#">City Planning &amp; Zoning Commission</a>, the County Planning Commission: <a href="https://www.burleighco.com/board/planning/">https://www.burleighco.com/board/planning/</a> and the <a href="#">Board of Adjustment</a>.</p> <p>14-02-01. Intent. It is the intent of the board of city commissioners to promote the health, safety and general welfare by guiding the development of the city by means of a comprehensive land use plan which is in part carried out by the provisions of this ordinance. It is the intent of this ordinance to provide regulations, standards and guides for the city's development which will:</p> <ul style="list-style-type: none"> <li>a) Lessen congestion in the streets;</li> <li>b) Secure safety from fire, panic and other dangers;</li> <li>c) Promote the health and general welfare;</li> <li>d) Prevent the overcrowding of land;</li> <li>e) Provide adequate light and air;</li> <li>f) Avoid undue concentration of population;</li> <li>g) Facilitate adequate provision for transportation, water, sewerage, schools, parks and other requirements.</li> </ul> <p>More Information: <a href="http://www.bismarcknd.gov/index.aspx?nid=138">http://www.bismarcknd.gov/index.aspx?nid=138</a></p>
<b>Floodplain Ordinance</b>	<p>The floodplain ordinance is contained with the Bismarck Zoning Ordinance – Title 14. The purpose of the regulations set forth by the floodplain ordinance (14-04-19) is to promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions. A “Floodplain Administrator” is designated by the City of Bismarck to administer the City’s floodplain regulations.</p> <p>More information: <a href="http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962">http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962</a></p>
<b>Flood Insurance Study and Flood Insurance Rate Maps</b>	<p>Flood Insurance Study and Flood Insurance Rate Maps:  <a href="https://www.bismarcknd.gov/1466/Flood-Resources">https://www.bismarcknd.gov/1466/Flood-Resources</a></p>
<b>Snow Emergency Ordinance</b>	<p>City Ordinance Title 10 established snow emergency routes and outlines the process to issue a snow emergency declaration. A snow emergency declaration allows for the public works director to take specific actions such as allow for the discontinued use of snow plow “snow gates” to more efficiently remove snow. Title 12 (traffic code) and Title 14 (Zoning) also support snow emergency preparedness, mitigation, and response efforts. Title 12 authorizes the removal of parked vehicles located on a posted snow emergency routes during a declared snow emergency or otherwise impeding efficient snow removal or obstructing normal traffic flow. Title 14 requires available snow storage via islands, medians, and adjacent parking areas.</p>

<b>Land Use Planning and Ordinances</b> The following land use planning capabilities and ordinances are incorporated into the mitigation plan or planning process.	
	More information (title 10): <a href="https://www.bismarcknd.gov/DocumentCenter/View/157/Title-10---Public-Places-and-Property-Franchises?bidId=">https://www.bismarcknd.gov/DocumentCenter/View/157/Title-10---Public-Places-and-Property-Franchises?bidId=</a>
<b>Drought – City Ordinance</b>	Title 2 (Chapter 2-08) of the Bismarck City Ordinance provides authority to restrict the use of water and other utilities during a drought or other emergency following a declaration of emergency. More information: <a href="https://www.bismarcknd.gov/DocumentCenter/View/149/Title-02--Administration-and-Governmental-Organiz?bidId=">https://www.bismarcknd.gov/DocumentCenter/View/149/Title-02--Administration-and-Governmental-Organiz?bidId=</a>
<b>Neighborhood Parks and Open Space</b>	The Neighborhood Parks and Open Space <a href="#">ordinance</a> and <a href="#">policy</a> were both adopted by the City Commission in October 2013. More Information: <a href="http://www.bismarcknd.gov/index.aspx?nid=1474">http://www.bismarcknd.gov/index.aspx?nid=1474</a>

<b>Administration</b> Administration capabilities integrated within mitigation planning are noted below.	
<b>Planning and Zoning Commission</b>	The Bismarck Planning and Zoning Commission hears requests for major and minor subdivision plats, zoning changes, zoning ordinance text amendments, annexations, special use permits and rural lot splits. The City of Bismarck has zoning and subdivision authority within the corporate limits and the extraterritorial area. The Planning and Zoning Commission meets monthly. More information: <a href="https://www.bismarcknd.gov/1037/Planning-Zoning-Commission">https://www.bismarcknd.gov/1037/Planning-Zoning-Commission</a>
<b>Metropolitan Planning Organization</b>	The Metropolitan Planning Organization (MPO) provides a forum for public officials, citizens, and other interested groups to establish policies and plans for effectively addressing various metropolitan transportation issues. The MPO is comprised of five jurisdictions including: Bismarck, Lincoln, Mandan, and portions of Burleigh and Morton counties. More information: <a href="http://www.bismarcknd.gov/index.aspx?nid=133">http://www.bismarcknd.gov/index.aspx?nid=133</a>

<b>Departments, Staff and Committees: Mitigation Capabilities</b> The following department/staff mitigation capabilities are integrated into the mitigation planning process.	
<b>Building Inspections Department, Building Official</b>	Also see “Building Ordinance and Codes.” Bismarck has a full-time Building Official and additional full-time Building Inspections staff to enforce ordinances and building codes including building regulations, floodplain administration, addressing, and zoning administration and enforcement. : <a href="https://www.bismarcknd.gov/111/Building-Inspections">https://www.bismarcknd.gov/111/Building-Inspections</a>
<b>Environmental Health</b>	Bismarck has a Environmental Health Division within the Public Health Department. The Environmental Health Division is comprised of an Environmental Health Administrator and three Environmental Health Specialist. The Environmental Health Division enforces ordinances governing health and sanitation. The Environmental Health Division license and inspects the following business types in Bismarck: food service, lodging, body art, public and semi-public swimming pools, tanning. Other Environmental Health activities include: investigation of public health nuisances, special pet licensing, issuing noise permits and mold consultation.
<b>Floodplain Administrator</b>	The Building Official for Bismarck is designated as the Floodplain Administrator. The Floodplain Administrator (Building Official) administers the city’s floodplain regulations. The duties and responsibilities of the Floodplain Administrator are outlined in Title 14 Zoning (14-04-19). More information: <a href="http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962">http://nd-bismarck.civicplus.com/DocumentCenter/Home/View/1962</a>
<b>Planning Department</b>	The Planning Department is responsible for: <ul style="list-style-type: none"> <li>• Administering land use regulations for the City of Bismarck and portions of Burleigh County.</li> <li>• Coordinating the <a href="#">development application process</a> for zoning changes, major and minor subdivision plats, annexations, special use permits, variances, lot modifications, plat modifications (right-of-way vacations, easement releases, street name changes), site plan review and downtown design review</li> <li>• Administering <a href="#">HUD Grant Programs</a> (CDBG and HOME) for the City</li> <li>• Administering <a href="#">Downtown Programs</a> (Renaissance Zone and CORE) for the City</li> <li>• Providing staff support to the <a href="#">City Planning &amp; Zoning Commission</a>, the Burleigh County Planning and Zoning Commission (<a href="https://www.burleighco.com/board/planning/">https://www.burleighco.com/board/planning/</a>), the <a href="#">Board of Adjustment</a> and the <a href="#">Renaissance Zone Authority</a>.</li> <li>• Plat Reviews</li> </ul> More Information: <a href="https://www.bismarcknd.gov/138/Planning">https://www.bismarcknd.gov/138/Planning</a>

<b>Departments, Staff and Committees: Mitigation Capabilities</b> The following department/staff mitigation capabilities are integrated into the mitigation planning process.	
<b>Historic Preservation Commission</b>	The Historic Preservation Commission advises on matters related to nominations to the National Register of Historic Places, promotes and educates about the City's history and heritage and serves as a local historic resources for citizens and other City boards.
<b>Engineering Department</b>	The Engineering Department monitors contracted construction projects and permits by private contractors in the City of Bismarck streets, rights of way, and public easements. The Engineering Department also provides guidance and information relating to land development, stormwater and floodplain management, traffic matters (including parking, street signs, road closures and pavement markings), property boundaries, water distribution, sanitary sewer collection, transportation network master planning, records of public infrastructure (including water, sewer, road, lighting, and service lines to private buildings). The Engineering Department works in conjunction with the Public Works Department which is responsible for operations and maintenance of water utility services, streets/lights, waste and recycling, and city forestry. More Information: <a href="https://www.bismarcknd.gov/17/Engineering">https://www.bismarcknd.gov/17/Engineering</a>
<b>Geographic Information Systems</b>	The GIS Division is capable of producing maps, graphs, tables, images, and applications using geographic data to support operational and planning functions, including support to mitigation planning efforts.
<b>Information Technology</b>	Bismarck's IT team provides for technology solutions and support to enhance the efficiency and productivity of the City of Bismarck, managing and maintaining the city's IT infrastructure, ensuring seamless connectivity and robust security for all departments. Bismarck IT develops and maintains the city's cyber response plan and supports continuity of operations planning for city departments.
<b>Forestry</b>	Bismarck has a Forestry Division (within Public Works Department). Mitigation capabilities of the Forestry Division are identified in City Ordinance Title 13 providing the City Forester with authority to regulate/enforce forestry standards which govern planting, maintenance, removal, fertilization, pruning, and bracing of trees to minimize interference with utility lines and support public safety (ie: maintain visibility, public safety access, wildland/urban interface). Through promotion of the urban forestry program, stormwater run-off reduction is achieved as well with an estimated annual benefit of \$500,000.00. More information: <a href="http://www.bismarcknd.gov/index.aspx?nid=163">http://www.bismarcknd.gov/index.aspx?nid=163</a>
<b>Forestry Advisory Board</b>	The Forestry Advisory Board advises and assists the City Forester in tree management on streets, in parks and other public property in the city, as well as advises and assists in the enforcement of the Forestry Ordinance.
<b>Southwest Central Emergency</b>	The Southwest EPR Coordinator develops plans and capabilities to address public health (and all hazard) emergencies. Public Health

<b>Departments, Staff and Committees: Mitigation Capabilities</b>	
The following department/staff mitigation capabilities are integrated into the mitigation planning process.	
<b>Preparedness Regional Coordinator</b>	Emergency Operations Plans address Points of Distribution, Mass Vaccination, Strategic National Stockpile, Mass Fatality, Mental Health, Family Reunification, and Pandemic Influenza.
<b>Public Health Community Integration Facilitator</b>	The Community Integration Facilitator bridges relationships between local and state government, communication resources, the local population, and newcomers; and expands access to local resources (such as housing authorities) and services for newcomers.
<b>Human Relations Committee</b>	The Bismarck Human Relations Committee creates an atmosphere of inclusion, equality and accessibility through education and outreach to recognize the value of a diverse community.
<b>Committee for People with Disabilities</b>	The Bismarck-Mandan Mayors' Committee for People with Disabilities works to educate the public and initiate projects. The goal of their work is to establish a receptive climate for the involvement of people with disabilities in all aspects of life within the communities of Bismarck-Mandan.
<b>Emergency Manager</b>	Bismarck established an emergency management program at the city level in 2003 and employs a full-time city emergency manager partially funded by the Emergency Management Performance Grant. Alternate Emergency Managers are identified in the Continuity of Operations Plan. More information: <a href="https://www.bismarcknd.gov/495/Emergency-Management">https://www.bismarcknd.gov/495/Emergency-Management</a>

<b>Technical Mitigation Capabilities</b>	
<b>Warning Systems &amp; Services</b>	There are 27 outdoor warning sirens in Bismarck and surrounding area. Twenty-three of them are within city of Bismarck. The sirens are activated via the Central Dakota Communications Center (CenCom). CenCom also has emergency notification system technology to activate personnel and to notify a select area of the community of an impending or current situation. Notification/alerts may be sent out via land-line phone, cell phone, text, etc.
<b>Grant Writing</b>	All Departments have grant writing capability. Bismarck also has a Grants Coordinator position to assist with grants management including grant compliance.

<b>Financial Mitigation Capabilities</b>	
<b>Financial capabilities - various</b>	<ul style="list-style-type: none"> <li>-Capital Improvement project funding is approved annually via the city commission. See <i>Capital Improvement Program</i> under <i>Plans and Programs</i> above.</li> <li>-Bismarck City Commission has the authority to levy taxes.</li> <li>-Bismarck City Commission approves and may amend the city's budget.</li> <li>-Bismarck may incur debt through general obligation bonds. However, funds are more typically raised via taxes such as hotel/motel, liquor, sales tax, and car rental taxes.</li> <li>-Community Development Block Grant funds are utilized by Bismarck annually.</li> </ul>

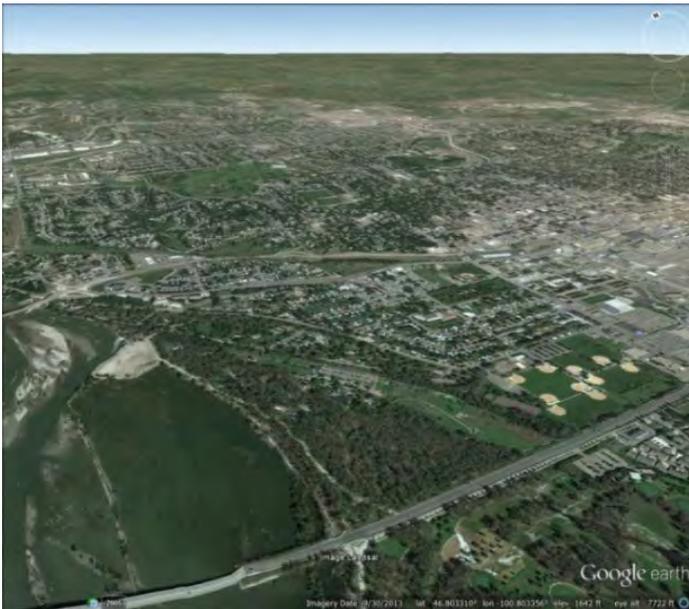
<b>Education and Outreach Mitigation Capabilities and Plan Integration</b>	
<b>Public Education: Mitigation and Emergency Preparedness</b>	<p>Various departments have capability and do conduct safety, mitigation, and emergency preparedness public education and outreach activities. City departments include Public Works, Public Health, Fire, Police, as well as Emergency Management. Other community partners also have this capability and conduct public education activities for the benefit of local citizenry including the business community. Other community partners include the American Red Cross, National Weather Service, Burleigh County, North Dakota Health and Human Services and ND Department of Emergency Services.</p>

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# Community Profile

## Geography

Bismarck, the county seat and State capital, is in the southwestern part of Burleigh County. Bismarck measures 36.31 square miles (April 2025), about 2% of the 1,668 square miles of Burleigh County. Within the past 5 years, the city expanded by 1.48 square miles. The Missouri River, flowing in a southerly to southeasterly direction, forms the western boundary of Bismarck. Bismarck lies within the eastern margin of the Great Plains, which is defined by gently rolling hills and wide expanses of prairie.

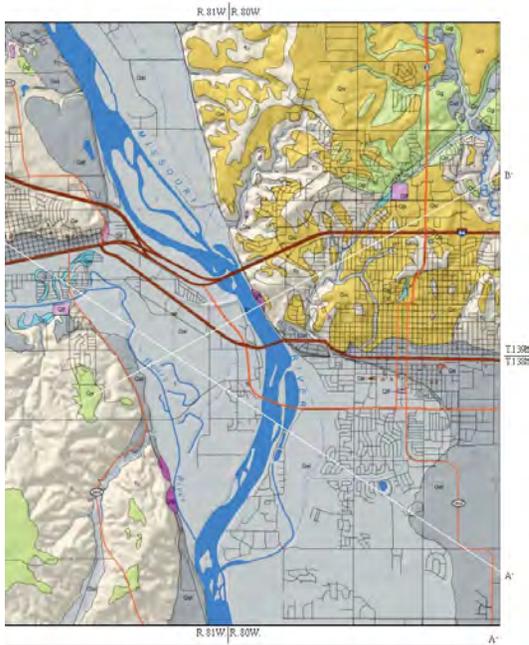


The north side of Bismarck is of higher elevation with a gently rolling terrain. The highest elevation in Bismarck is 1,973 near the Ash Coulee Drive water tower. There are relatively steep slopes adjacent to the Missouri River on the east side of River Road. The south side of Bismarck is of lower elevation and generally flat. The “gage 0” datum level is 1618.28 at the river gage near the water treatment in west Bismarck. 1630 is the typical lower elevation in southwest Bismarck.

Interstate 94 and US 83 are major transportation routes, and both bisect the city of Bismarck.

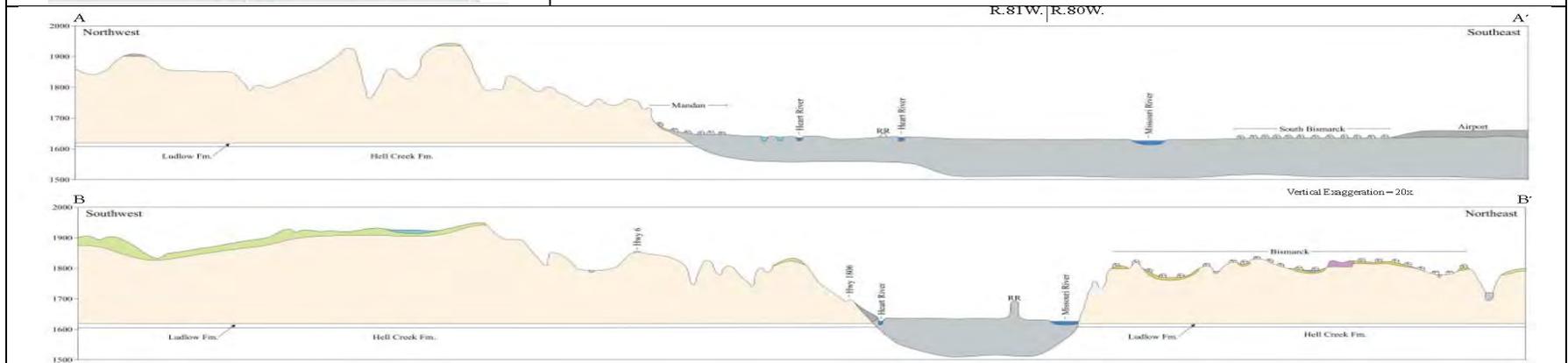
At Bismarck-Mandan the Missouri River Valley is only about two miles wide where Interstate Highway 94 crosses the river. On the south side of Bismarck the valley broadens to about six miles wide. The reason for this widening is that, prior to glaciation, the Heart and Little Heart rivers, which today flow into the Missouri River (the Heart River enters the Missouri River at Mandan; the Little Heart enters about ten miles south of Mandan), joined a few miles east of Bismarck. The old, combined valley of the Heart-Little Heart rivers still exists as the broad lowland south of Bismarck - a wide spot in the Missouri River valley.

The latitude of Bismarck is 46.808N. The longitude is -100.783W. Elevation varies from 1,600 to 1,973. Population of Bismarck in 2023 was 75,092, which is latest estimate by the U.S. Census Bureau. The City of Bismarck’s form of government is a five-member city commission, elected at-large, of which the president is also the Mayor of the city.



The Missouri River forms the western boundary of Bismarck. The elevation of the majority of south Bismarck (shown below at right top) is not significantly higher than the normal or typical river elevations throughout the year. Much of south Bismarck could not be developed until after the completion of the Garrison Dam in 1953. The lower right of the bottom diagram shows a cross section of north Bismarck. The location of each cross section below is based on the geology map at left. Mandan is shown on the west (left) side of the map and diagram.

Source of map and diagram: ND Geologic Survey, Department of Mineral Resources  
[https://www.dmr.nd.gov/ndgs/documents/Publication\\_List/pdf/geoinv/GI\\_3.pdf](https://www.dmr.nd.gov/ndgs/documents/Publication_List/pdf/geoinv/GI_3.pdf)



## Community Changes Overview

Since January 1, 2020 Bismarck has gained 946 acres added to the city limits through numerous annexations. The location of the annexations since 2020 are shown on page 5.

Since January 1, 2020, to April 17, 2025 the City of Bismarck issued a total of 1,977 new building permits (each with a unique address).

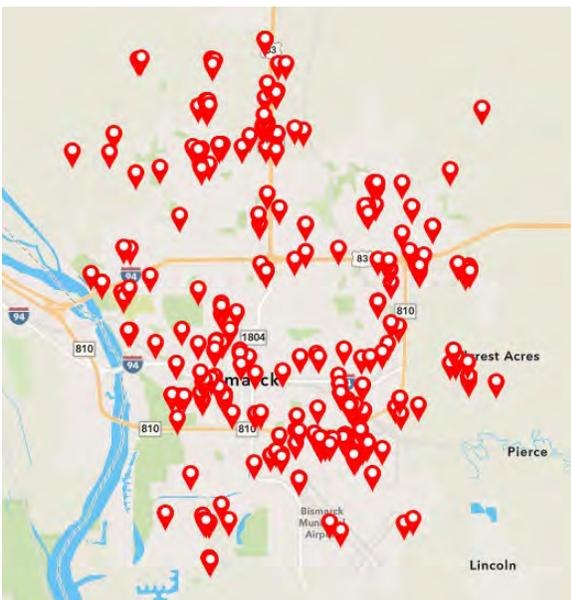
FEMA completed a study and update to the Burleigh County Flood Insurance Study and Flood Insurance Rate Map (FIRM) for the Missouri River and select tributaries. The study and update FIRM became effective on June 6, 2024. This effort also resulted in the update of Bismarck’s floodplain zoning ordinance, which was adopted June 6, 2024.

Changes in building counts within the Special Flood Hazard Area (SFHA) within Bismarck and the 4-mile ETA:

Year End	Total buildings within the SHFA. Includes Bismarck and the 4-mile ETA.
2020	2420
2021	2520
2022	2550
2023	2563
*2024	3,876

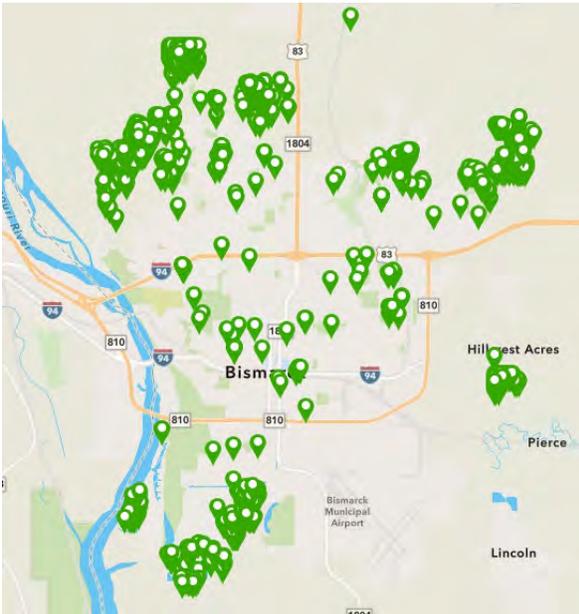
\*As a result of the FIRM update effective June 6, 2024, there were 1,742 buildings added to the floodplain and 413 were removed. Additional structures were built within the floodplain (61) as well as 18 affected by map revisions in the year 2024. The current total buildings within the SFHA as of January 9, 2025 is 3,876.

Three hundred thirty-eight (338) building permits for commercial, new construction, were issued from January 1, 2020 through May 1, 2025. The general locations of the new construction commercial building permits are illustrated below.



Of these new commercial permits issued, there is a limited number of structures located within the 100-year floodplain:

- Bismarck Riverfront Festival Grounds Building
- Burleigh County Housing (South Washington Street) – 3 structures
- 3 Restaurants located at Kirkwood Mall (South 3<sup>rd</sup> Street)
- 1 shop condo – Hagen Drive
- Cell Tower (South 12<sup>th</sup> Street)
- Lift Station (Boston Drive)



1,443 building permits for new residential construction were issued from January 1, 2020 through May 1, 2025. None of the new structures are within the 100-year floodplain. However, due to the updated Flood Insurance Rate Map that became effective as of June 6, 2024, many structures were added to the floodplain. See page 3 for a summary count of structures within the 100-year floodplain (Special Flood Hazard Area).

A recent change to the ETA boundary, based on agreement with Burleigh County, will have impact as it relates to floodplain management and other regulatory authority for this area outside of city limits. Approximately 95% of the ETA, and associated responsibility, is transferred to Burleigh County.

Two new elementary schools were built to accommodate growth in north Bismarck. Silver Ranch elementary in NE Bismarck and Elk Ridge Elementary in NW Bismarck. Both are located in areas annexed within the last 5 years. A building permit has also been issued for a new Bismarck Public Schools Career and Technical Education Facility in NE Bismarck (Silver Ranch).

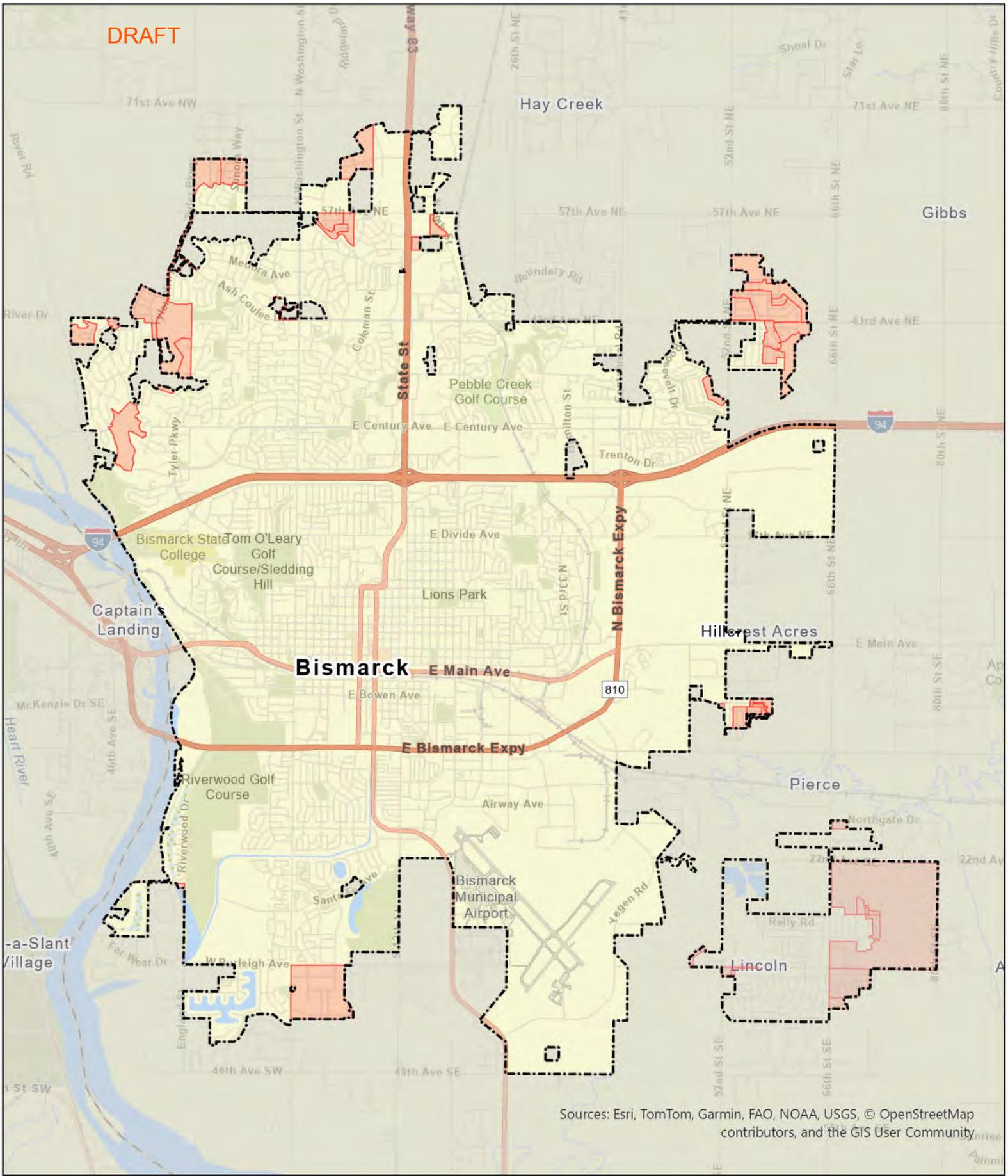
Three new outdoor warning sirens were added in 2023. The new sirens are located in north Bismarck; one in the northwest, north central, and northeast part of Bismarck due to community growth.

Since 1990, Bismarck has shown steady growth in population. The approximate percentage increase per decade since 1990 is 12%, 10% and 20% based on the decennial censuses. The population of the public school system has been seeing steady growth. The median household incomes have increased since 2018 (\$75,846 in 2023 vs. \$65,567 in 2018), and persons below the poverty level remains consistent (9.6% in 2023 vs. 9.5% in 2018).

### Community Changes Impact Summary

As a result of community changes, the vulnerability to hazards and potential for impact may be considered to be somewhat elevated compared to previous years. Therefore, the importance of mitigation, public education, and communication becomes elevated as well. Within Section 9, Hazard Profiles, there is a summary of increase and/or decrease of vulnerability specific to each hazard as it relates to community changes or other factors.

DRAFT



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



### Annexation Change Since 2020

Map Created: April 2025  
by GIS Division

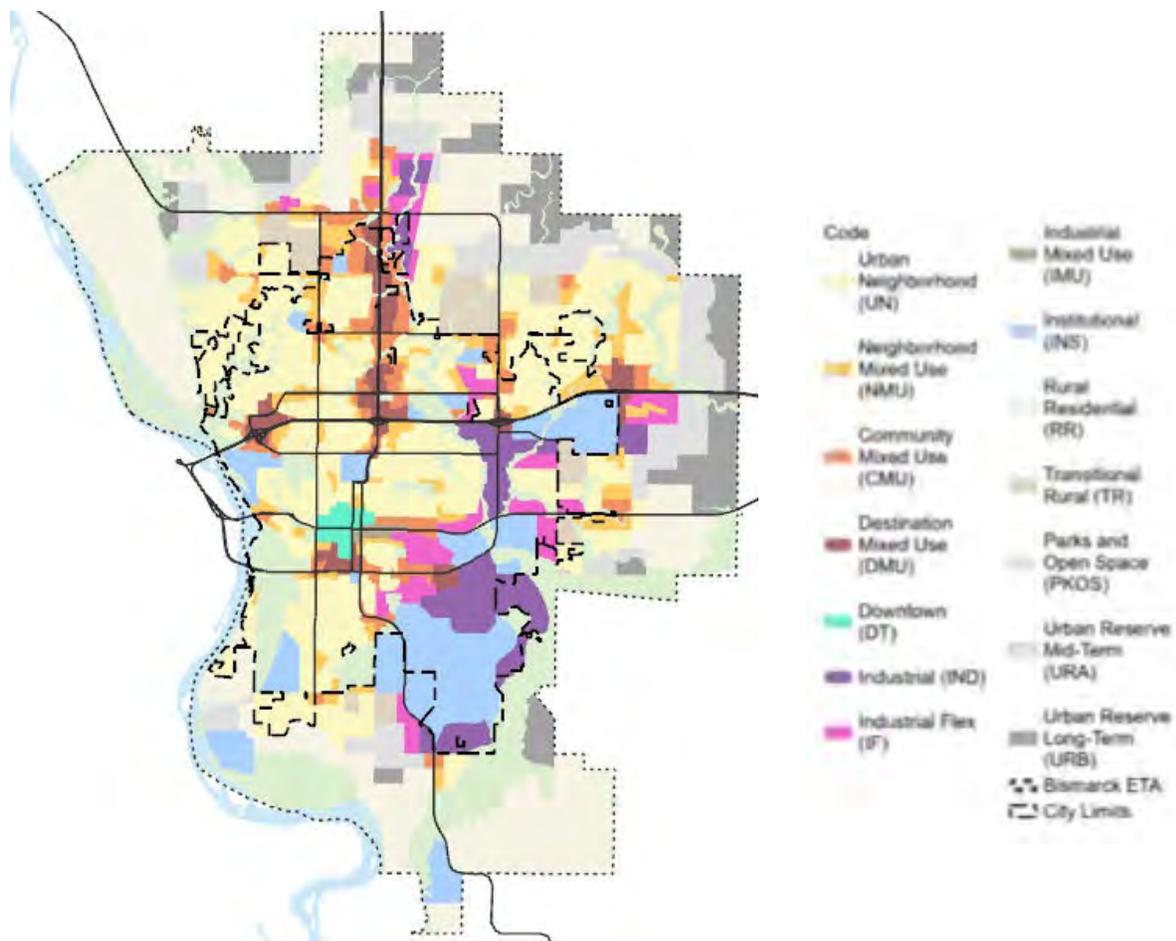
-  City Limits
-  Annexation History



## Future Land Use Plan

The Future Land Use Plan is a map that shows various districts in the City of Bismarck and its extraterritorial area that are planned to take shape by the year 2045. This plan is intended to guide:

- Decisions on rezonings, subdivisions, special use permits and other activities managed by the Planning and Zoning Commission
- Investment decisions made by the private sector and general public, by providing reasonable expectations for future growth of the city
- Capital improvements and infrastructure development by the City and other entities.



Source: City of Bismarck, Together 2045 Comprehensive Plan

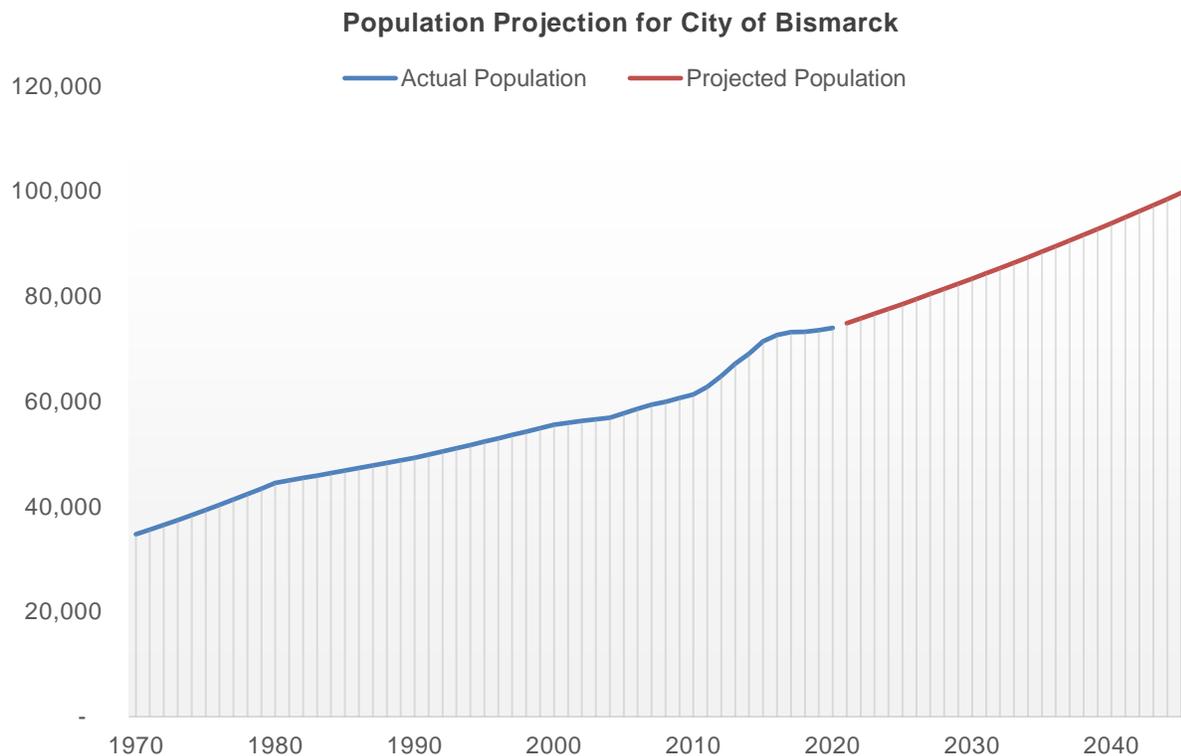
<https://www.bismarcknd.gov/DocumentCenter/View/41634/Together-2045-Comprehensive-Plan?bidId=>

## Growth Rate and Population Projection

A projected population growth rate of 1.2% per year is proposed for the following reasons: This reasonably aligns with the long-term population trends for Bismarck, accounting for both boom and bust cycles.

- This represents an exponential pattern of growth, which fits the historic curve better than a linear regression.
- A fixed annual rate of growth is simple to use and apply to any future year.
- This is the population growth rate used for the Arrive 2045 Metropolitan Transportation Plan, and the travel demand model used to project future transportation needs used this projection. Both plans would be aligned.

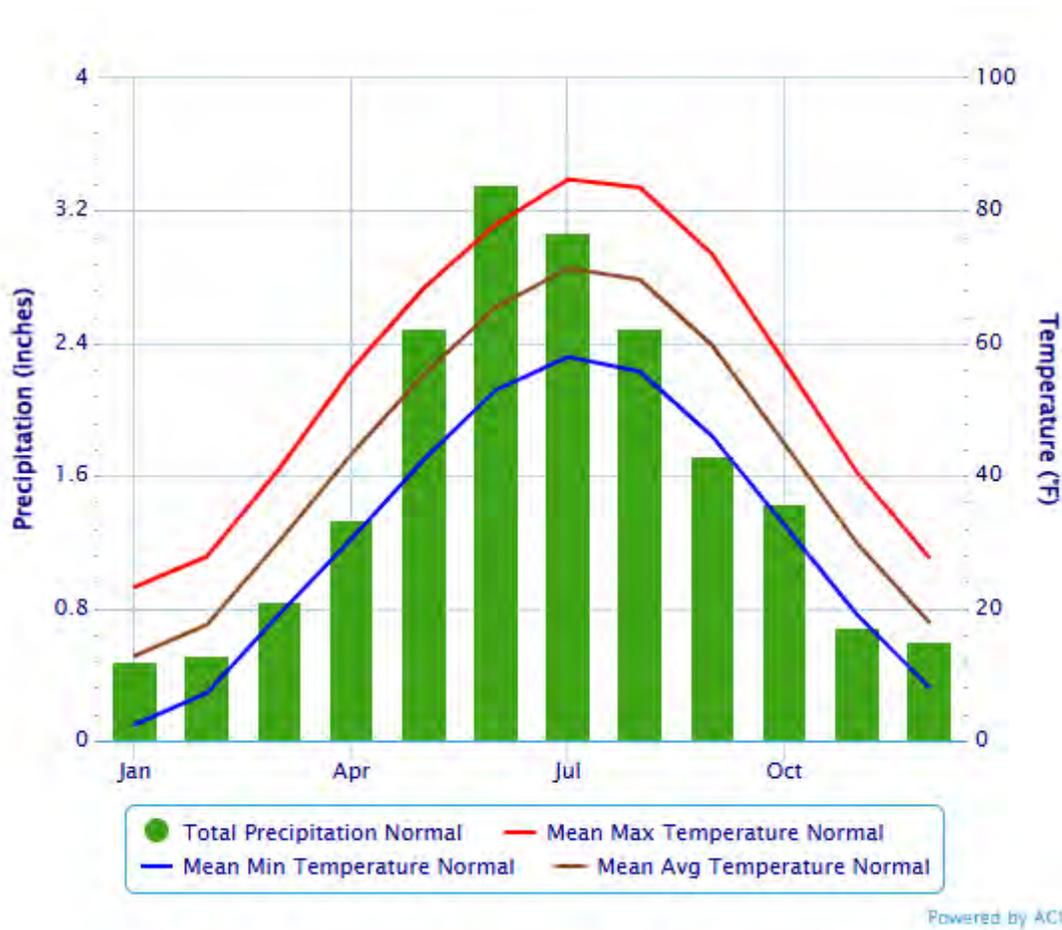
Based on this projection, the City of Bismarck will grow by approximately a thousand people per year and have a population of 99,647 by 2045.



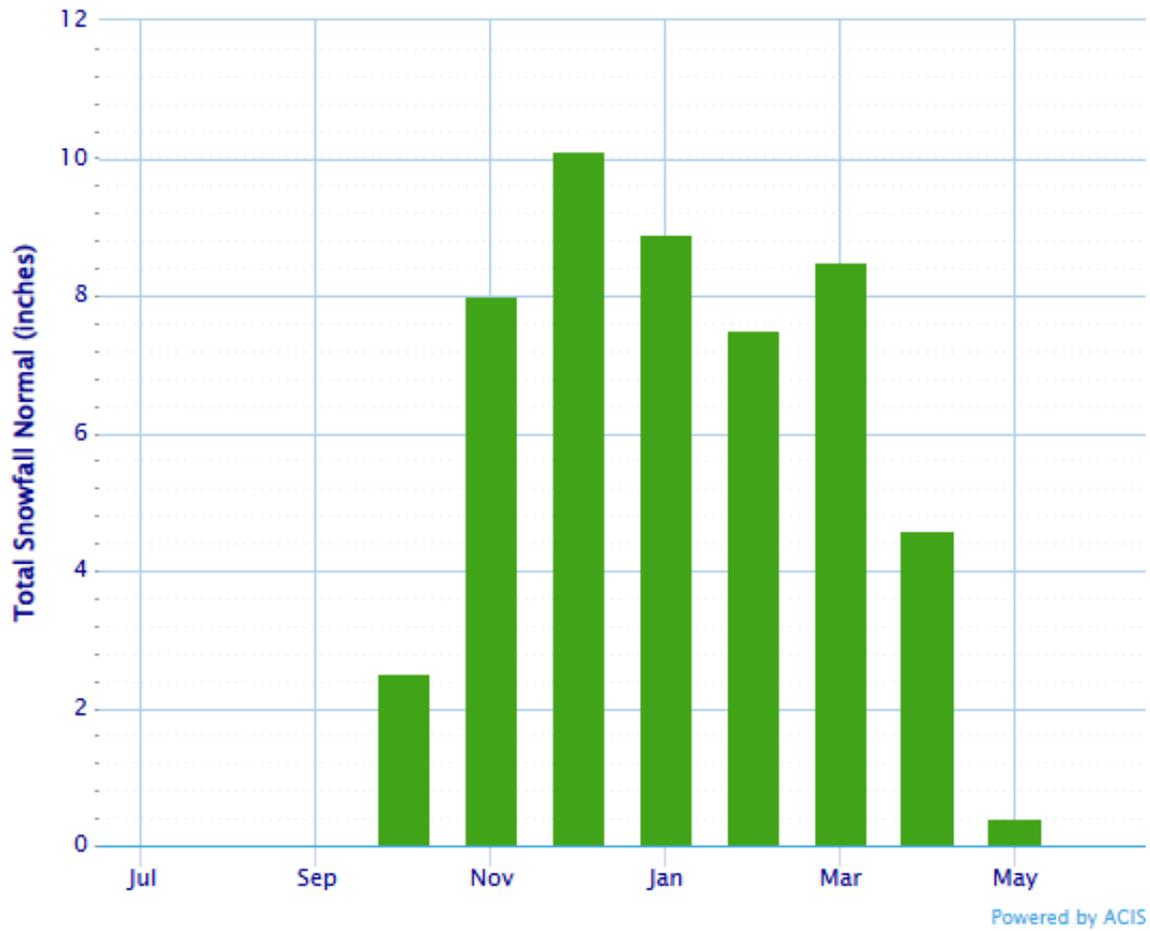
## Climate Summary

Source: [https://www.weather.gov/bis/climate\\_bis](https://www.weather.gov/bis/climate_bis)

### Monthly Climate Normals (1991-2020) – Bismarck Area, ND



Month	Total Precipitation Normal (inches)	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)	Mean Avg Temperature Normal (°F)
January	0.48	23.2	2.4	12.8
February	0.52	27.8	7.2	17.5
March	0.84	41.0	19.1	30.1
April	1.34	56.0	30.4	43.2
May	2.50	68.3	42.4	55.3
June	3.36	77.9	52.9	65.4
July	3.07	84.7	57.9	71.3
August	2.50	83.5	55.7	69.6
September	1.72	73.4	45.9	59.7
October	1.43	57.1	32.6	44.8
November	0.69	40.6	19.1	29.9
December	0.60	27.7	8.1	17.9
Annual	19.05	55.1	31.1	43.1



Month	Total Snowfall Normal (inches)
July	0.0
August	0.0
September	0.0
October	2.5
November	8.0
December	10.1
January	8.9
February	7.5
March	8.5
April	4.6
May	0.4
June	0.0
Annual	50.5

### Bismarck Climate Data - Daily Extremes Years 1874-2024

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Highest Daily Temperature (degree F)</b>											
63	73	81	93	102	111	114	109	105	95	79	66
<b>Lowest Daily Temperature</b>											
-45	-45	-36	-12	17	30	32	32	10	-10	-30	-43
<b>Highest Daily Precipitation</b>											
0.67	1.02	1.80	2.35	2.65	3.19	4.32	4.63	4.31	1.68	1.13	1.16
<b>Highest Daily Snowfall</b>											
13.2	10.3	15.5	17.3	8.5	0.00	0.00	0.00	4.1	8.6	10.8	10.5

### Bismarck Climate Data - Monthly Extremes Years 1874-2025

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Maximum Precipitation (amount/year)</b>											
1.64	1.74	3.27	5.71	7.37	9.9	13.75	9.29	6.93	4.73	3.10	2.06
1877	2000	1876 1916	1878	2013	1914	1993	1998	1977	2013	1896	2016
<b>Minimum Precipitation (amount/year)</b>											
0.00	0.03	0.00	0.00	0.04	0.00	0.10	"T"	0.02	0.00	0.00	0.00
1878	1894	1930	1888	1901	1918	1894	1921	1883	1889	1990	1896
1901	1913	2021	1926	1917	1919	1936	1922	1899	1935	1902	1944
1924	1915	2025	1956	1936		1959	1970	1948	1968	1912	1954
1935	1985					1967		2012	1993	1963	1986
<b>Record Snowfall</b>											
25.0	25.6	31.1	21.9	10.3	0.00	0.00	0.00	5.00	23.7	31.0	33.3
1982	1979	1975	2022	1950	-	-	-	1984	1991	1896	2008

## Bismarck Climate Data - Extremes Top 10 Extremes from years 1874-2025

Rank	Value	Date	Rank	Value	Date
<b>Highest Daily Maximum Temperature (degree F)</b>					
1	114	7/6/1936	6-7	109	7/11/1973
2	112	7/30/2006	6-7	109	8/5/1941
3	111	6/29/2002	8-9	108	7/20/1960
4-5	110	7/16/1936	8-9	108	7/9/1921
4-5	110	7/10/1936	10	107	June and July various dates
<b>Lowest Daily Minimum Temperature (degree F)</b>					
1	-45	2/16/1936	6-9	-43	2/9/1994
2	-45	1/13/1916	6-9	-43	12/31/1967
3-5	-44	1/15/2009	6-9	-43	2/19/1929
3-5	-44	1/18/1950	6-9	-43	2/1/1887
3-5	-44	1/2/1887	10	-42	1/12/1974 1/12/1887 2/15/1936 12/20/1916
<b>Highest Daily Precipitation (inches)</b>					
1	4.63	8/21/1998	6	3.36	6/26/1914
2	4.48	8/12/1999	7	3.25	6/3/1947
3	4.32	7/15/1993	8	3.19	6/15/2009
4	4.31	9/15/1994	9	3.12	8/9/1909
5	3.67	9/7/1894	10	2.92	8/1/1915
<b>Highest Daily Snowfall (inches)</b>					
1	17.3	4/14/2013	6	11.9	3/26/1950
2	15.5	3/3/1966	7	11.9	4/3/1937
3	15.2	4/5/1997	8	11.8	3/30/2009
4	13.2	1/17/1996	9	11.6	3/19/1982
5	11.9	4/27/1984	10	11.0	3/21/1894

Source: NOAA - National Weather Service Weather Forecast Office [https://www.weather.gov/bis/climate\\_bis](https://www.weather.gov/bis/climate_bis)

Annual Temperature Averages and Extremes – Bismarck ND 1874-2024				
Annual Average	Highest Annual Average	Year	Lowest Annual Average	Year
43.1 F	47.2 F	2021	35.4 F	1875

*Of the top twenty rankings for highest annual average temperature, 16 of 20 records occurred since 1980. Five of the top ten warmest years occurred since year 2000. The 1930's hold two records of the top twenty.*

<b>Annual Temperature Rankings</b> Bismarck, ND Period of Record Beginning 1874	Warm	Cold	YEAR	Temperature					
	1	150	2021	47.2°F		11	139	1998	45.2°F
	2	149	2016	46.5°F		11	139	1878	45.2°F
	3	148	1931	46.3°F		13	136	2005	44.8°F
	4	147	2006	46.2°F		13	136	1999	44.8°F
	5	146	1987	46.1°F		13	136	1981	44.8°F
	6	145	2024	46.0°F		16	135	2017	44.7°F
	7	144	1934	45.7°F		17	134	1991	44.6°F
	8	143	2020	45.6°F		18	133	1921	44.4°F
	9	142	2012	45.5°F		19	132	2001	44.3°F
	10	141	2015	45.3°F		20	130	1990	44.2°F

Annual Precipitation Averages and Extremes – Bismarck ND 1875-2024				
Annual Average	Highest Annual Average	Year	Lowest Annual Average	Year
19.05"	30.92"	1876	5.97"	1936
	29.58"	2019	7.74"	1934

*Eight of the top 20 wettest years have occurred since year 2000.*

<b>Annual Precipitation Rankings</b> Bismarck, ND Period of Record Beginning 1875	Wet	Dry	YEAR	Precipitation					
	1	145	1876	30.92"		11	135	1915	23.25"
	2	144	2019	29.58"		12	134	2011	23.22"
	3	143	1875	27.53"		13	133	2010	23.18"
	4	142	1993	26.99"		14	132	2009	23.12"
	5	141	2013	26.75"		15	131	2000	23.00"
	6	140	1999	26.45"		16	130	1914	22.98"
	7	139	1986	24.24"		17	129	1879	22.61"
	8	138	1998	23.70"		18	128	1965	21.53"
	9	137	2016	23.48"		19	127	1975	21.50"
	10	136	1884	23.36"		20	126	2001	21.34"

Seasonal Snowfall Averages and Extremes – Bismarck ND 1886-2024				
Annual Average	Highest Annual Average	Year	Lowest Annual Average	Year
50.5"	101.6"	1996-97	13.3"	1914-15
	101.3"	2022-23	13.6"	2011-12

*Twenty-four of the top 25 season snowfall records occurred since 1970.*

<b>Seasonal Snow Rankings</b> Bismarck, ND Period of Record Beginning 1886	Wet	Dry	YEAR	Snow					
	1	140	1996-1997	101.6"		13	128	1983-1984	66.5"
	2	139	2022-2023	101.2"		14	127	1896-1897	64.7"
	3	138	2008-2009	100.3"		15	126	1998-1999	64.5"
	4	137	1993-1994	91.8"		16	125	1977-1978	63.7"
	5	136	1949-1950	86.8"		17	124	1966-1967	61.7"
	6	135	2010-2011	85.4"		18	123	1985-1986	61.2"
	7	134	1978-1979	83.0"		19	122	2018-2019	60.3"
	8	133	1981-1982	80.3"		20	121	1974-1975	58.7"
	9	132	1995-1996	80.1"		21	120	1991-1992	57.5"
	10	131	2016-2017	71.5"		22	119	2012-2013	57.3"
	11	130	1986-1987	67.9"		23	118	2019-2020	55.6"
	12	129	1994-1995	67.1"		24	117	2009-2010	55.4"
					25	116	2021-2022	55.1"	

## Community Characteristics

The Metropolitan Planning Organization develops the MPO Monitoring Report, as a living document which provides for an overview of People & Housing, Employment, and Travel. Future trends and projections are also provided as applicable. The report is a snapshot of the Bismarck-Mandan Community: <https://www.bismarcknd.gov/1457/Monitoring-Report>

### Population

PEOPLE	Bismarck	North Dakota
Population, estimates July 1, 2024 (V2024)	NA	796,568
Population, estimates July 1, 2023 (V2023)	75,092	783,926
Population, estimates base, April 1, 2020, (V2023)	73,626	779,079
Population, percent change, April 1, 2020 to July 1, 2024	NA	2.2%
Population, percent change, April 1, 2020 to July 1, 2023	2.0%	0.6%
Population, Census, April 1, 2020	73,622	779,094
Persons under 5 years, percent, 2023	5.6%	6.3%
Persons under 18 years, percent, 2023	21.9%	23.6%
Persons 65 years and over, percent, 2023	18.7%	17.0%
Female persons, percent, 2023	50.3%	48.7%

Sources: ND Department of Commerce and US Census Bureau – QuickFacts

### Population by Age Group

Age	2000		2010		Change 00-10	2020		Change 00-20	2023 Estimate		Change 00-23
	Number	% of total	Number	% of total		Number	% of total		Number	% of total	
Under 5	3,356	6.0%	3,896	6.4%	540	4,595	6.2%	1,239	3,744	5.0%	388
5 to 9	3,431	6.2%	3,431	5.6%	0	4,626	6.3%	1,195	3,733	5.0%	302
10 to 14	3,790	6.8%	3,350	5.5%	-440	4,362	5.9%	572	4,813	6.4%	1,023
15 to 19	4,308	7.8%	3,765	6.1%	-543	4,323	5.9%	15	3,980	5.3%	-328
20 to 24	4,380	7.9%	5,035	8.2%	655	4,865	6.6%	485	5,684	7.6%	1,304
25 to 34	7,339	13.2%	9,110	14.9%	1,771	10,920	14.8%	3,581	10,973	14.6%	3,634
35 to 44	8,842	15.9%	6,886	11.2%	-1,956	9,637	13.1%	795	9,453	12.6%	611
45 to 54	7,815	14.1%	8,879	14.5%	1,064	7,553	10.3%	-262	7,533	10.0%	-282
55 to 59	2,545	4.6%	4,218	6.9%	1,673	4,354	5.9%	1,809	3,819	5.1%	1,274
60 to 64	2,084	3.8%	3,291	5.4%	1,207	4,786	6.5%	2,702	5,587	7.4%	3,503
65 to 74	3,888	7.0%	4,435	7.2%	547	7,273	9.9%	3,385	8,787	11.7%	4,899
75 to 84	2,631	4.7%	3,379	5.5%	748	4,076	5.5%	1,445	5,042	6.7%	2,411
85 and over	1,123	2.0%	1,597	2.6%	474	2,252	3.1%	1,129	1,954	2.6%	831
<b>Total</b>	<b>55,532</b>	<b>100.0%</b>	<b>61,272</b>	<b>100.0%</b>	<b>5,740</b>	<b>73,622</b>	<b>100.0%</b>	<b>18,090</b>	<b>75,102</b>	<b>100.0%</b>	<b>19,570</b>

Sources: U.S. Census Bureau - 2000 Decennial Census, Table DP1; 2010 Decennial Census, Table P12; 2020 Decennial Census, Table DP1; 2023 American Community Survey, 5-year Estimates, Table DP05

## Demographics

PEOPLE	Bismarck	North Dakota
White alone, percent, 2023	84.8%	86.4%
Black or African American alone, percent, 2023 (a)	2.5%	3.8%
American Indian and Alaska Native alone, percent, 2023 (a)	5.0%	5.3%
Asian alone, percent, 2023 (a)	1.0%	1.7%
Native Hawaiian and Other Pacific Islander alone, percent, 2023 (a)	0.3%	0.2%
Two or More Races, percent, 2023	5.4%	2.6%
Hispanic or Latino, percent, 2023 (b)	3.2%	4.9%
White alone, not Hispanic or Latino, percent, 2023	84.0%	82.6%
Living in same house 1 year & over, percent, 2019-2023	85.5%	83.6%
Foreign born persons, percent, 2019-2023	3.6%	4.5%
Language other than English spoken at home, pct age 5+, 2019-2023	4.5%	6.4%
High school graduate or higher, percent of persons age 25+, 2019-2023	95.0%	93.8%
Bachelor's degree or higher, percent of persons age 25+, 2019-2023	38.7%	32.3%
Veterans, 2019-2023	4,118	43,237
Mean travel time to work (minutes), workers age 16+, 2019-2023	15.5	18.0
Housing units, July 1, 2023	34,852*	380,841
Owner-occupied housing unit rate, 2019-2023	65.8%	63.4%
Housing units in multi-unit structures, percent, 2019-2023*	30.8%	28.0%
Median value of owner-occupied housing units, 2019-2023	\$291,400	\$241,100
Households, 2019-2023	32,208	325,079
Persons per household, 2019-2023	2.23	2.31
Per capita money income in past 12 months (2023 dollars), 2019-2023	\$44,475	\$42,474
Median household income, 2019-2023	\$77,698	\$75,949
Persons in poverty, percent, 2023	9.7%	9.8%

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

Z: Value greater than zero but less than half unit of measure shown

Source: US Census Bureau – QuickFacts; \*American Community Survey, 5-year Estimates, Table DP04: Selected Housing Characteristics

## Income

INCOME (IN 2023 INFLATION-ADJUSTED DOLLARS)	North Dakota				Bismarck			
	Estimate	Margin of Error	Percent	Percent Margin of Error	Estimate	Margin of Error	Percent	Percent Margin of Error
Total households	325,079	±1,663	325,079	(X)	32,208	±482	32,208	(X)
Less than \$10,000	14,303	975	4.4%	±0.3	1,449	322	4.5%	±1.0
\$10,000 to \$14,999	11,378	975	3.5%	±0.3	1,127	258	3.5%	±0.8
\$15,000 to \$24,999	21,780	1300	6.7%	±0.4	2,287	419	7.1%	±1.3
\$25,000 to \$34,999	23,406	1300	7.2%	±0.4	1,868	354	5.8%	±1.1
\$35,000 to \$49,999	35,434	1300	10.9%	±0.4	3,253	419	10.1%	±1.3
\$50,000 to \$74,999	54,288	1625	16.7%	±0.5	5,604	580	17.4%	±1.8
\$75,000 to \$99,999	45,186	1300	13.9%	±0.4	4,187	419	13.0%	±1.3
\$100,000 to \$149,999	59,815	1950	18.4%	±0.6	6,281	612	19.5%	±1.9
\$150,000 to \$199,999	29,582	1300	9.1%	±0.4	3,060	419	9.5%	±1.3
\$200,000 or more	29,907	1300	9.2%	±0.4	3,124	483	9.7%	±1.5
Median household income (dollars)	75,949	±1,002	(X)	(X)	77,608	±4,245	(X)	(X)
Mean household income (dollars)	100,487	±1,248	(X)	(X)	99,685	±4,078	(X)	(X)

An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.

An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.

An '(X)' means that the estimate is not applicable or not available

Source: US Census Bureau – 2023 American Community Survey, 5-year Estimates, Table S1901: Income in the Past 12 Months (in 2023 Inflation-Adjusted Dollars)

## Poverty Statistics

PEOPLE	Bismarck	North Dakota
Households, 2019-2023	32,208	325,079
Persons per household, 2019-2023	2.23	2.31
Per capita money income in past 12 months (2023 dollars), 2019-2023	\$44,475	\$42,474
Median household income (in 2023 dollars), 2019-2023	\$77,608	\$75,949
Persons in poverty, percent, 2023	9.7%	9.8%

Source: US Census Bureau - QuickFacts

### Employment Status

EMPLOYMENT STATUS	North Dakota				Bismarck			
	Estimate	Margin of Error	Percent	Percent Margin of Error	Estimate	Margin of Error	Percent	Percent Margin of Error
Population 16 years and over	622,500	±2,487	622,500	(X)	62,277	±1,112	62,277	(X)
In labor force	432,302	±5,756	69.4%	±0.9	40,825	±2,042	65.6%	±3.0

Source: US Census Bureau – American Community Survey, Table DP03 – Selected Economic Characteristics

### Business Quick Facts

	Bismarck	North Dakota
Total number of firms, 2022	2,067	18,251
Minority-owned firms, percent, 2022	4.4%	5.0%
Women-owned firms, percent, 2022	18.2%	17.9%

F: Fewer than 100 firms

S: Suppressed; does not meet publication standards

Sources: City of Bismarck and US Census Bureau - QuickFacts

### Leading Industries:

Health Care and Education

Retail Trade

Arts, Entertainment, Hospitality

Construction

Public Administration

### Five Largest Employers:

<https://www.bismarckmandanecd.com/workforce/major-employers>

- State of North Dakota (4,456 employees)
- Sanford Health (4,204 employees)
- Bismarck Public Schools (2,580 employees)
- CHI St. Alexius Health (1,290 employees)
- Doosan Bobcat (1,280 employees)

## Housing Statistics

PEOPLE	Bismarck	North Dakota
Living in same house 1 year & over, percent 2019-2023	85.5%	83.6%
Foreign born persons, percent, 2019-2023	3.6%	4.5%
<b>Language other than English spoken at home, pct age 5+, 2019-2023</b>	4.5%	6.4%
High school graduate or higher, percent of persons age 25+, 2019-2023	95.0%	93.8%
Bachelor's degree or higher, percent of persons age 25+, 2019-2023	38.7%	32.3%
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Persons per household, 2019-2023	2.23	2.31
Per capita money income in past 12 months (2023 dollars), 2019-2023	\$44,475	\$42,474
Median household income, (in 2023 dollars) 2019-2023	\$77,608	\$75,949
Persons in poverty, percent, 2023	9.7%	9.8%

Source: US Census Bureau – QuickFacts; \*2023 American Community Survey, 5-year Estimates, Table DP04: Selected Housing Characteristics

HOUSE HEATING FUEL	North Dakota				Bismarck			
	Estimate	Margin of Error	Percent	Percent Margin of Error	Estimate	Margin of Error	Percent	Percent Margin of Error
Occupied housing units	325,079	±1,663	325,079	(X)	32,208	±482	32,208	(X)
Utility gas	134,835	±2,416	41.5%	±0.7	21,749	±666	67.5%	±1.8
Bottled, tank, or LP gas	44,535	±1,168	13.7%	±0.4	511	±182	1.6%	±0.6
Electricity	129,646	±2,169	39.9%	±0.7	9,294	±610	28.9%	±1.9
Fuel oil, kerosene, etc.	5,942	±388	1.8%	±0.1	82	±86	0.3%	±0.3
Coal or coke	434	±129	0.1%	±0.1	6	±11	0.0%	±0.1
Wood	1,196	±195	0.4%	±0.1	13	±20	0.0%	±0.1
Solar energy	44	±30	0.0%	±0.1	0	±24	0.0%	±0.1
Other fuel	4,945	±491	1.5%	±0.2	162	±78	0.5%	±0.2
No fuel used	3,502	±467	1.1%	±0.1	391	±164	1.2%	±0.5
SELECTED CHARACTERISTICS								
Occupied housing units	325,079	±1,663	325,079	(X)	32,208	±482	32,208	(X)
Lacking complete plumbing facilities	1,307	±278	0.4%	±0.1	90	±81	0.3%	±0.3
Lacking complete kitchen facilities	1,908	±316	0.6%	±0.1	83	±53	0.3%	±0.2
No telephone service available	2,901	±438	0.9%	±0.1	218	±126	0.7%	±0.4

An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.

An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.

An '(X)' means that the estimate is not applicable or not available

Source: U.S. Census Bureau - 2023 American Community Survey, 5-year Estimates, Table DP04: Selected Housing Characteristics

## Additional Resources

The Metropolitan Planning Organization (MPO) maintains a community “Monitoring Report” on the City of Bismarck Website at <https://www.bismarcknd.gov/1457/Monitoring-Report>

- *Although the focus of the MPO is transportation related, the information contained within the MPO’s Monitoring Report provides for detail regarding People, Housing, Employment, and Travel within the MPO area (Bismarck/Mandan).*

Current City of Bismarck City Construction Projects Story Map:

<https://bismarck.maps.arcgis.com/apps/MapSeries/index.html?appid=e8d06816c8114f18a07019c34d31b04a>

- The story map link above shows the major construction projects in the city within six different areas:
  1. Street Rehab and Repair
  2. Street Lighting
  3. Watermain
  4. Signal Upgrades
  5. Sewer Upgrades
  6. New Developments.

# Community Assets

Community Assets are inventories for planning purposes, to assist in the identification of potential impacts and vulnerabilities within the various hazard profiles. Specific community assets are also identified within the various hazard profiles where applicable. This section provides an overview of the type of community assets identified to aid in hazard profile development and updating.

Community asset categories and category descriptions:

## **Critical Facilities**

A facility that provides a critical service or product that is vital to the community for continuity of emergency services, critical government services, medical services, and critical supplies.

## **Critical Infrastructure**

Transportation infrastructure and utility infrastructure including gas, electricity, communications, sewer and water.

## **Schools**

All schools including licensed daycare to college and private schools.

## **Hazardous Materials Sites**

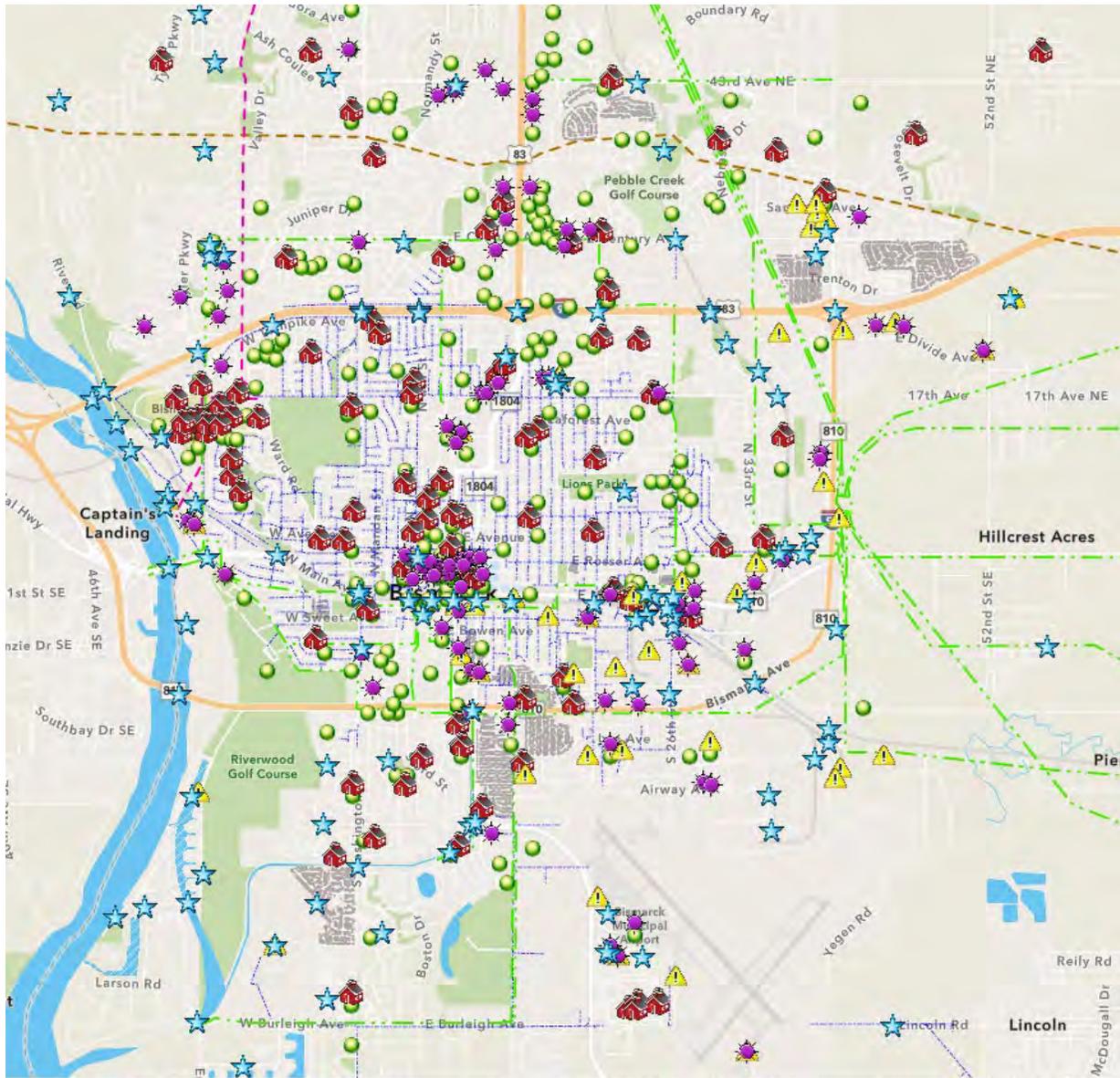
Hazardous Materials Sites contain chemical, biological, or other substances. If a hazardous materials facility is impacted, there may be an additional threat to the community because of the potential for a release.

## **Vulnerable / Special Populations**

Includes areas of “assembly” where a facility or site is likely to have a “high density” population within a relatively small area. Schools are not included, as they are a separate category. Includes populations that may require special assistance during response and recovery efforts. Examples are jail/prison populations, nursing homes, assisted living, etc.

The map on the following page identifies the various community assets as noted above. The map is maintained by Bismarck Emergency Management and Bismarck GIS.

The visual below illustrates various community assets as described on page 1 of this section. Assets identified and reviewed for purposes of this mitigation plan include critical facilities (purple), Critical Infrastructure (blue), schools, hazardous materials sites required to report (yellow), and vulnerable populations (green).



# Hazard Profiles

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**Hazard Profiles** are included *Alphabetically by Hazard Name*.

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Ten of the hazards are addressed primarily as **Natural Hazards**: Drought, Flood, Geologic Hazards, Infectious Disease, Pest Infestation, Severe Summer Weather, Space Weather, Tornado, Wildland Fire, and Winter Storm.

Nine of the Hazards are addressed primarily as **Technological or Human-Caused Hazards**: Active Threat, Aircraft Accident, Cyberattack, Dam Failure, Fire, Hazardous Materials Release, Terrorism or Nation State Attack, and Train Derailment. In some cases, hazards may be the result of natural, technological, and/or human caused. Each hazard is categorized based on the more likely cause of significant impact.

### Methodology

Each hazard or group of related hazards has its own profile. A stand-alone hazard profile allows for the comprehensive analysis of each hazard from many different aspects. The tornado hazard was addressed separately from Severe Summer Weather because of the significant differences in terms of probability, magnitude and extent of potential impact compared to other summer-related hazards. Each hazard contains a hazard description as well as an analysis of risk (including historical occurrences) and a vulnerability assessment as well as descriptions relating to magnitude, extent, and potential impact of the hazard. The hazard profiles (for natural hazards) contain a vulnerability assessment table, which is used as a tool to identify vulnerabilities from different perspectives. Vulnerability summary statements included in Section 3 are based on the more detailed hazard profile and vulnerability assessments included within this plan section. The Risk Assessments for each hazard are summarized in Section 10.

# Active Threat – Hazard Profile

## Description

Vulnerabilities and specific mitigation actions will not be included in this plan for the Active Threat Hazard to avoid compromising safety and security of specific facilities and populations. Regarding the active threat hazard, the mitigation plan content is limited to profiling the hazard, identifying existing mitigation or prevention measures, and identifying general risk mitigation recommendations.

### **Active Threat**

The Bismarck Police Department has developed an “Active Threat Response Plan” to provide uniform guidelines and provisions for use in responding and resolving situations involving crimes of violence in progress involving an Active Threat situation with the potential for more victims. Active Threat crimes include but are not limited to situations such as Active assailants in schools, businesses, public places, gatherings as well as any other type of ongoing crime of violence where innocent victims are in in continuous imminent danger due to the ongoing act of an Active Threat.

Active Threat definition (within Bismarck PD Active Threat Response Plan): Subject or subjects that are utilizing deadly force and without intervention would continue to do so while, having unrestricted access to additional victims. The means of deadly force by the subject does not necessarily need to be that of a firearm.

# Vulnerability Assessment

Vulnerability: Characteristics of community assets that make them susceptible to damage from a given hazard.

	<b>Active Threat</b>
<b>Probability</b>	Possible
<b>Speed of Onset</b>	Limited or No Notice
<b>Duration</b>	Minutes to Hours
<b>Geographic Area</b>	Small targeted area (ex: facility or property level) – usually targeting a specific population or individual/s
<b>Death / Injury</b> 1. Primary Causes  A. Highest vulnerability	<p>1. Active Attack. (use of various weapons: guns, knives, explosives, etc)</p> <p>A. Targeted groups such as government entities/employees, religions, and LGBTQIA population.</p> <p>B. Densely populated areas (buildings or events)</p> <p>C. First Responders (ie: law enforcement personnel)</p>
<b>Mass Casualty Incident</b>	Possible
<b>Property Losses</b> (points of vulnerability – high priority)	Property Damage may be extensive depending on weapons used such as explosives. May be limited to targeted property and adjacent properties.
<b>Environmental</b> (points of vulnerability – high priority)	
<b>COG/COOP</b> (points of vulnerability – high priority)	All City Departments may be the target of active threats.
<b>Critical Facilities</b> (points of vulnerability – high priority)	Those with limited or no security measures.
<b>Critical Infrastructure</b> (points of vulnerability – high priority)	Typically, the target would be individuals associated with the critical infrastructure, not the infrastructure itself.
<b>Schools</b> (points of vulnerability – high priority)	Probability is considered equal for all schools. Vulnerability will vary based on security measures and procedures in place.
<b>High Risk Facilities (chemical)</b> (points of vulnerability – high priority)	Typically, the target would be individuals associated with the high risk facility, not the facility itself.
<b>Specific Populations:</b> Public Assembly, Vulnerable / Special Populations (points of vulnerability – high priority)	<p>Businesses (more frequent than school events nationwide)</p> <p>Government Buildings &amp; Staff</p> <p>Places of Worship</p> <p>Schools</p> <p>Groups or individuals targeted by hate crimes.</p>
<b>Economy</b> (community-wide)	Usually limited to the impacted facility
<b>OTHER:</b> (points of vulnerability – high priority)	

<b>Changes in Vulnerability</b> Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
New facilities including schools and businesses are equally vulnerable to locations (facilities) existing prior to this plan update.	No changes. See Active Threat Hazard Mitigation Capabilities listed in Section 3.

**Risk**

See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan.

**Relationship to other Hazards:** Active Threat and Civil Disturbance are closely related. One hazard may initiate the other. The occurrence of other hazards may contribute to the likelihood of an active threat or active attack due to compounding stress and frustrations.

**Future Conditions**

- **Location:** The locations of active threat hazards will remain the same, with the exception of additional businesses, schools, etc that may become a targeted location.
- **Extent/Intensity:** No change.
- **Frequency:** No expected change.
- **Duration:** No change.

**Anticipated Future Climate Impact – Active Threat Hazard**

Climate conditions are not expected to be the direct cause of the unrest or active attacks, but may exacerbate underlying instabilities. Like civil disturbance, most crime results from societal reasons such as economic hardship, social injustices, ethnic differences with long-standing oppression by a group of people towards another, objections to world organizations or certain governments, political grievances, and terrorist acts (USAR, 2005). Future climate projections through the end of the century indicate the potential for increased societal insecurities and instabilities (Hoegh-Guldberg, 2018) including places like the Northern Great Plains region as exemplified by recent Dakota Access Pipeline (DAPL) civil unrest (Powys-White, 2016; Levin, 2016; EELP, 2023). *Source: 2024-29 ND Enhanced Mitigation Plan.*

## Previous Occurrences

### Previous Threats (not carried out)

August 19, 2025: Bomb Threat at local bank in Bismarck. Bismarck PD issued a shelter in place recommendation for locations within the vicinity via CodeRED and cordoned off the area. A male wearing the backpack walked into the bank on North Fourth Street about 11:20 a.m. and made a veiled threat regarding an explosive device. The backpack the suspect was wearing was later deemed safe.

May 2, 2023: Numerous schools in North Dakota including Bismarck High School were the target of hoax calls reporting an active shooter . The call that came to Bismarck had recorded gunfire in the background. Police responded to BHS at about 9:45 am and concluded a room-by-room search at about 12:30 pm.

Bismarck Police also responded to Bomb Threats at north Walmart on November 15, 2021 and south Walmart on May 21, 2019.

A bomb threat at the Bismarck Event Center delayed high school graduation ceremonies on May 27, 2007. The threat made resulted in the evacuation of Century High School graduating seniors and the rest of the crowd at the beginning of the 5 pm Friday graduation ceremony. The event resumed at about 6 pm after the bomb squad did a sweep of the building.

The list above is NOT all-inclusive of previous threats.

## Building Security Risk Mitigation Recommendations

### Procedures:

- Conduct a realistic security assessment to determine the facility's vulnerability to an active assailant attack.
- Identify multiple evacuation routes and practice evacuations under varying conditions; post evacuation routes in conspicuous locations throughout the facility; ensure that evacuation routes account for individuals with special needs and disabilities.
- Designate shelter locations with thick walls, solid doors with locks, minimal interior windows, first-aid emergency kits, communication devices, and duress alarms.
- Designate a point-of-contact with knowledge of the facility's security procedures and floor plan to liaise with police and other emergency agencies in the event of an attack.
- Incorporate an active assailant/threat drill into the organization's emergency preparedness procedures.
- Vary security guards' patrols and patterns of operation.
- Limit access to blueprints, floor plans, and other documents containing sensitive security information, but make sure these documents are available to law enforcement responding to an incident.
- Establish a central command station for building security.

### Systems:

- Put in place credential-based access control systems that provide accurate attendance reporting, limit unauthorized entry, and do not impede emergency egress.
- Put in place closed-circuit television systems that provide domain awareness of the entire facility and its perimeter; ensure that video feeds are viewable from a central command station.
- Put in place communications infrastructure that allows for facility-wide, real-time messaging.
- Put in place elevator systems that may be controlled or locked down from a central command station.

### Training:

- Train building occupants (city-owned buildings and broader community) on response options outlined by ALERRT. <http://alerrt.org/>

**Avoid, Deny, Defend** These core concepts incorporate the response options of "Run, Hide, Fight," while providing for a more thorough explanation of additional response options within "Avoid, Deny, Defend."

# Aircraft Accident – Hazard Profile

## Description

The property of Bismarck Airport, located in south Bismarck, consists of 2,400 acres which includes two runways, a control tower, and a 70,000 square foot terminal building completed in 2005.

In part because of the economic growth in Bismarck and in the state, as well as being a destination location for hunters and other tourists, the airport continues to expand its commercial flight options and is actively used by those using or owning privately owned smaller aircraft. Throughout much of the airports history, there have typically been two commercial airlines providing service. As of 2025, there are four commercial airlines and 75 general aviation based airplanes. The airport now has more flights, more destinations, and more use of the airport by the local, regional, and wider community.

Total annual passenger boardings continue to increase:

<b>Total Annual Passenger Boardings</b>				
<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
194,043	196,414	236,172	237,683	245,205
<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
259,734	271,022	272,739	282,363	309,337
<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
150,161	213,668	241,927	256,761	294,580

Additional information regarding the Bismarck Airport: [www.bismarckairport.com](http://www.bismarckairport.com)

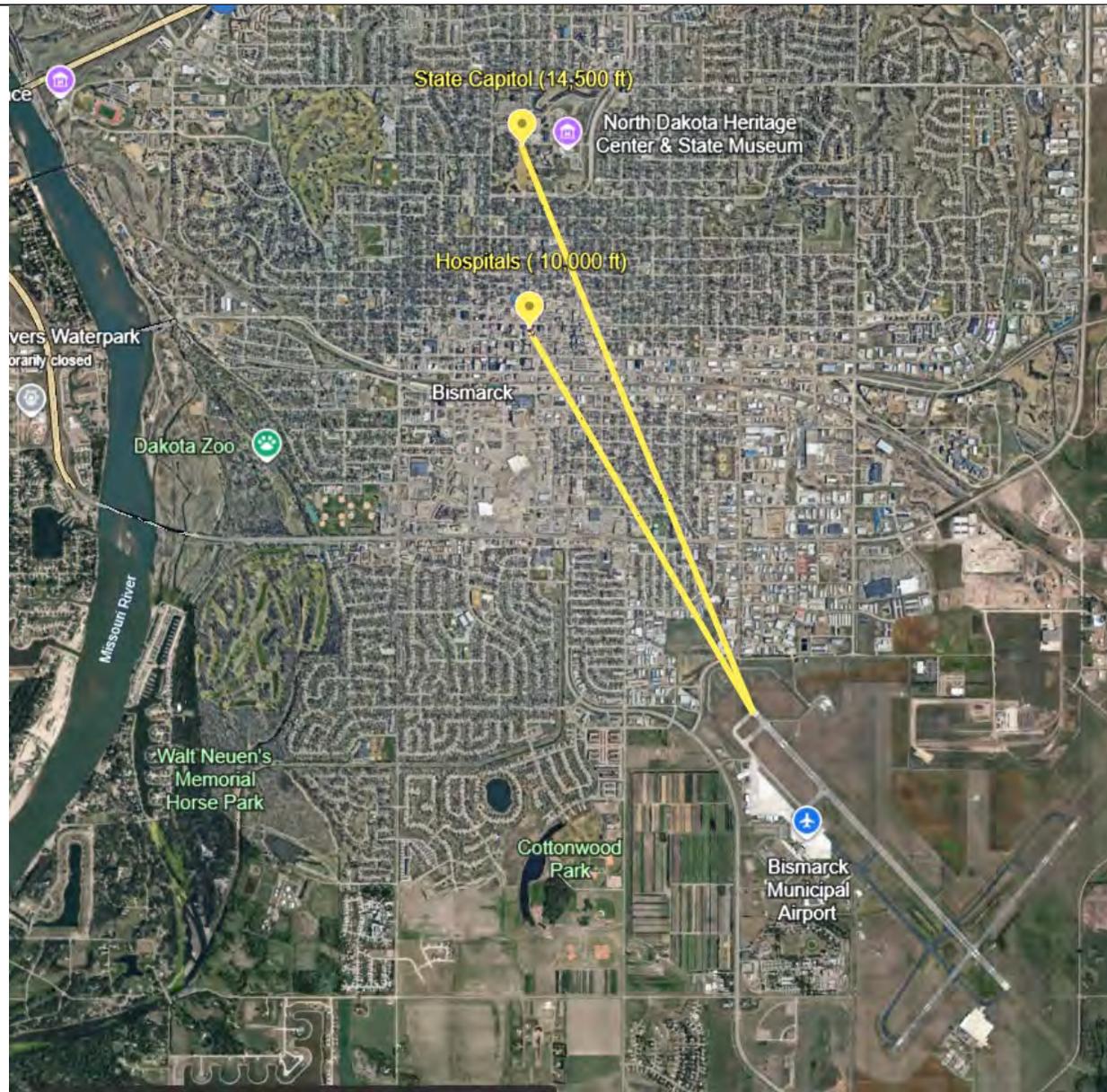
In most disasters, death and injury represent one of the effects of the hazard, while in aircraft accidents (ie: incidents involving major airlines), mass casualties are often the primary impact and focus of the event. An aircraft accident may be intentional as well. Terrorists have used transportation, particularly mass transportation, as a method of delivering their attacks throughout the world.

A mass casualty event from an airline crashing on or near the airport would stress the city’s hospitals, clinics and emergency response capabilities. Mass casualties can be defined as an incident resulting in a large number of deaths and/or injuries that reaches a magnitude that overwhelms local resources. In this case, mutual aid as well as state, federal, and private resource assistance would be requested.

The **Accident Potential Zone (APZ)** is an area beyond the ends of a runway where aircraft accidents are statistically more likely, particularly during takeoff and landing. It typically includes a Clear Zone extending 3,000 feet from the runway end, followed by APZ I (5,000 feet) and APZ II (7,000 feet), aligned with the flight path. While the provided map outlines key population hazards in yellow—including the North Dakota State Capitol and nearby hospitals—it does not represent the full extent of the APZ."

Reference: Aircraft Rescue and Fire Fighting IFSTA Manual 6<sup>th</sup> Addition.

Approximate distance from the end of the runway to the State Capitol is 14,500 feet (noted by red line). Approximate distance to the two major hospitals is 9,000 to 10,000 feet.



The highest population and number of properties within 15,000 feet (within the APZ) of the Bismarck Airport are northwest of the airport based on the alignment of the runway running NW/SE. Properties and populations within that distance include CHI St. Alexius Health, Sanford Health, the State Capitol, five mobile home parks, twelve schools, and Bismarck critical facilities including Bismarck Police Department, the City/County Building and Bismarck Burleigh Public Health.

The most vulnerable populations are the crew members and frequent travelers based on extensive use of aircraft (higher use equals higher risk or probability).

The city of Lincoln, as it continues to grow, will be within the air traffic pattern of the Bismarck Airport (within the Accident Potential Zone).

# Vulnerability Assessment

Vulnerability: Characteristics of community assets that make them susceptible to damage from a given hazard.

	Aircraft Accident– Commercial Airline
<b>Probability</b>	Possible
<b>Speed of Onset</b>	No notice event or may have some notice based on identified issues creating risk (prior to landing)
<b>Geographic Area</b>	Not specific, however, areas of concern include the geographic area within the Accident Potential Zone (APZ)
<b>Death / Injury</b> 1. Primary Causes  A. Highest vulnerability	1. Crash impact and/or Fire  A. Crew and Passengers B. Those within the APZ (higher risk)
<b>Mass Casualty Incident</b>	1. Yes. Mass casualty is the primary concern for aircraft accidents.
<b>Property Losses</b>	1. Properties within the Accident Potential Zone.
<b>Environmental</b>	1. An aircraft accident could involve the Missouri River, Hay Creek, or Apple Creek. Environmental impact would be primarily fuel and debris entering the waterways.
<b>COG/COOP</b>	Critical Facilities within the APZ: 1. City County Building 2. Bismarck Police Department 3. Bismarck Burleigh Public Health 4. State Capitol 5. Burleigh County Courthouse 6. United Tribes Technical College, although in close proximity, is NOT within the flight path.
<b>Critical Facilities</b>	1. See COG/COOP above. 2. Bismarck Event Center 3. CHI St. Alexius Health 4. Sanford Health
<b>Critical Infrastructure</b>	1. Railroad (BNSF) is within APZ 2. DMVW Railroad within APZ

	Aircraft Accident– Commercial Airline
<b>Schools</b>	Schools within the APZ: <ol style="list-style-type: none"> <li>1. Jeanette Myhre Elementary School</li> <li>2. Bismarck High School</li> <li>3. St. Mary’s Central Middle School</li> <li>4. Willmore Elementary</li> <li>5. BECEP</li> <li>6. St. Anne’s Grade School</li> <li>7. Pioneer Elementary</li> <li>8. Saxvik Elementary</li> <li>9. Simle Middle School</li> <li>10. South Central Middle School</li> <li>11. Roosevelt Elementary</li> <li>12. Cathedral Elementary</li> </ol>
<b>High Risk Facilities (chemical)</b>	<ol style="list-style-type: none"> <li>1. Airport Fuel Farm</li> </ol>
<b>Specific Populations:</b> Public Assembly, Vulnerable / Special Populations	<ol style="list-style-type: none"> <li>1. Crescent Manor</li> <li>2. Mobile Home Parks: Holiday Park, Airport Village, Skyway Park Village, Stardust Terrace, Colonial Estates</li> </ol>
<b>Economy</b> (community wide)	Catastrophic (THIRA Rating)
<b>OTHER:</b>	The potential for inappropriate (illegal) use of drones within proximity, either intentionally or unintentionally provides for additional vulnerability (interaction between drones and aircraft).

<b>Changes in Vulnerability</b>	
Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
The potential for inappropriate (illegal) use of drones within proximity, either intentionally or unintentionally, provides for additional vulnerability (interaction between drones and aircraft).	Note: Airport Response Plans have been updated to address the potential for the illegal use of drones within the area.

**Risk**

See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan.

**Relationship to other Hazards:** Extreme weather events may influence the risk and potential impact or severity of an aircraft accident. Aircraft, if used as a weapon, would be considered a Terrorism or Nation-State Attack event. If a significant aircraft accident occurred, the aircraft accident may initiate other hazards such as Fire, Wildland Fire, and may involve Hazardous Materials. Space Weather can impact HF Frequencies used by commercial airline industry.

**Future Conditions**

- **Location:** No change.
- **Extent/Intensity:** See “Anticipated Future Climate Impact” below.
- **Frequency:** No change.
- **Duration:** No change.

**Anticipated Future Climate Impact – Aircraft Accident Hazard**

Impact would be indirect. Projected increases in frequency or intensity of storms may impact likelihood.

## Previous Occurrences

As of 2025, there have been no large commercial line aircraft accidents at the Bismarck Airport or within Burleigh County. However, there have been accidents and even fatalities involving smaller aircraft. The largest number of fatalities for any one incident within Burleigh County is one fatality. Most aircraft accidents involve smaller aircraft.

Bismarck Airport may also be the receiver of redirected flights for aircraft requiring emergency landing. In these cases, the aircraft is not landing at its destination location. Airline incidents and incident related information can be found at the National Transportation Safety Board website: <http://www.nts.gov/>

### Airplane Accident Statistics

Aircraft accidents predominantly occur during phases of flight where the aircraft is close to the ground. According to the Federal Aviation Administration (2022), over 25% of general aviation fatal accidents take place during the maneuvering phase—typically involving low-altitude turning, climbing, or descending. Similarly, the National Transportation Safety Board (2014) found that the landing phase is the most frequent point of occurrence for personal flying accidents.

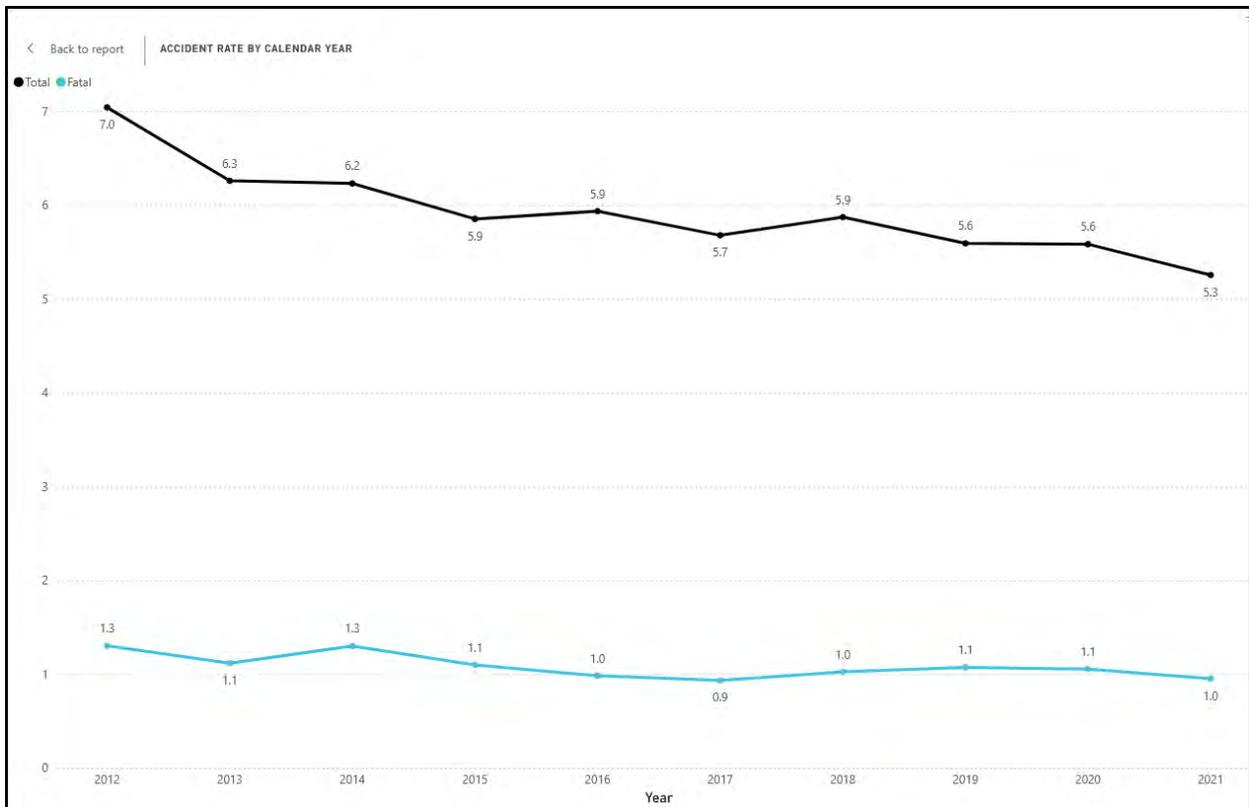
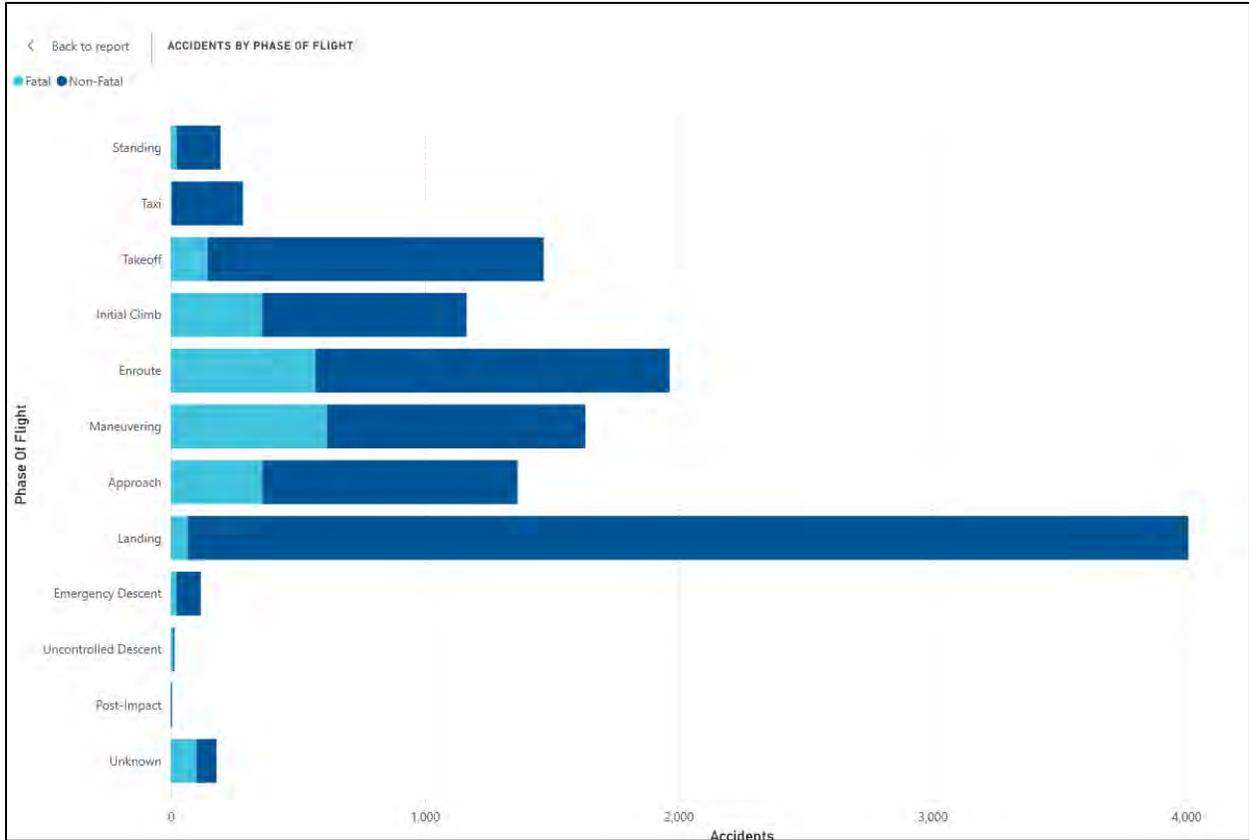
Fatal accidents are more likely during the takeoff and initial climb phases, when aircraft engines are under maximum load and any mechanical issues are more likely to become apparent. In these cases, pilots may attempt an emergency return to the airport—commonly referred to as a “turnback.” However, executing a turnback is both technically and operationally challenging, as it typically occurs after a failure has already impaired aircraft performance and often at a low altitude with limited maneuvering options.

### References

Federal Aviation Administration. (2022, February 4). Maneuvering flight. <https://www.faa.gov/newsroom/safety-briefing/maneuvering-flight>

National Transportation Safety Board. (2014). Review of U.S. civil aviation accidents, calendar year 2011 (NTSB/ARA-14/01). <https://www.nts.gov/safety/data/Documents/ARA1401.pdf>

National Transportation Safety Board. (2024). General Aviation Accident Dashboard. <https://www.nts.gov/safety/data/Pages/GeneralAviationDashboard.aspx>



# Civil Disturbance – Hazard Profile

## Description

Civil disturbance is a term that is typically used by law enforcement to describe forms of disturbance caused by groups of people. Civil disturbance is typically a symptom of socio-political problems in the form of a protest or riot. The severity of these actions typically coincide with the level of public outrage.

Civil disturbances can also arise out of labors disputes, correction center uprisings, or a public gathering or event that becomes disorderly. Civil disturbance can range from a group of people impeding access to a building, blocking a street, or disrupting normal activity through noise or intimidation. Civil disturbance can manifest in many different levels of disruption. These vary from a peaceful demonstration, such as a sit-in to a mob that burns or destroys property and terrorizes and assaults citizens. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order. Often protests intended to be a peaceful demonstration to the public and the government can escalate into general chaos. There are two types of large gatherings typically associated with civil disturbances: a crowd and a mob. A crowd may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified in to the following four categories (Blumer 1946):

- **Casual Crowd:** A casual crowd is a group of people who happen to be in the same place at the same time. Violent conduct does not occur.
- **Cohesive Crowd:** A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshipping, dancing, or watching a sporting event. Members of these crowds may have intense internal discipline, and require substantial provocation to arouse to action.
- **Expressive Crowd:** An expressive crowd is one held together by a common commitment or purpose. They may not be formally organized, and are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest.
- **Aggressive Crowd:** An aggressive crowd is composed of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They may be more impulsive and emotional and require only minimal stimulation to arouse violence. Examples of this type of civil unrest crowd could include demonstrators and strikers, though not all demonstrators and strikers are aggressive.

Civil unrest and disturbances affect the following factions of society:

- **The Public:** The general population could serve as participants or targets in actions of civil unrest. Widespread unrest could cause fear amongst the populace and cause them to be absent from school or work activities. During an event, bystanders may be harmed because of the activities of participants.
- **Responders:** Responses to civil unrest events are generally handled at the local level. In a large event, the resources of a local jurisdiction may be exceeded. In this instance, State resources would be activated to fill the need. During an event, responders may become targets, which could hamper their effectiveness.
- **Continuity of Operations:** The outbreak of widespread rioting or looting could have potential impact on the City's ability to provide services and conduct its normal operations. Protesters could occupy government buildings and interrupt the normal functions of government, or targeted attacks on government facilities could interrupt operations entirely.
- **Property:** Private property often serves as a target in instances of civil unrest. Businesses can be targeted for looting or vandalism. If an event is particularly large, damage could reach millions of dollars and recovery could take years.
- **Facilities:** Often in acts of civil unrest government facilities become the focal point of protests or targets for vandalism. Damage suffered during an event or the inability of a worker to enter a facility may greatly reduce a facility's effective capacity or close it completely.
- **Infrastructure:** Similar to government facilities, public and private infrastructure can become targets of civil unrest. Damage to transportation, communications, or utilities infrastructure could further exacerbate the situation.
- **Environment:** Normally, instance of civil unrest will have a minimal impact on the environment. However, if petroleum or other chemical facilities were a target for vandalism or large-scale fires occurred, the impact on the environment could be significant.

Various media and social media platforms make the distribution of misinformation, disinformation, or mal-information potentially more effective in promoting lack of trust in government and officials who are traditionally considered subject matter experts, and civil disturbance incidents may occur, partially as a result of inaccurate information or propaganda.

**Definitions from the Princeton Library** <https://princetonlibrary.org/guides/misinformation-disinformation-malinformation-a-guide/>

- **Misinformation** is defined as false, incomplete, inaccurate/misleading information or content which is generally shared by people who do not realize that it is false or misleading. This term is often used as a catch-all for all types of false or inaccurate information, regardless of whether referring to or sharing it was intentionally misleading.
- **Disinformation** is false or inaccurate information that is intentionally spread to mislead and manipulate people, often to make money, cause trouble or gain influence.
- **Malinformation** refers to information that is based on truth (though it may be exaggerated or presented out of context) but is shared with the intent to attack an idea, individual, organization, group, country or other entity. [Mediadefence.org](http://mediadefence.org)

## Mitigation

The City of Bismarck bears the first and primary responsibility to control the disturbance within the city limit of Bismarck. Civil unrest that remains uncontrolled warrants local mutual aid from neighboring municipalities and/or county resources. If the civil unrest remains beyond the capabilities of local law enforcement agencies alone, the North Dakota Highway Patrol assistance may be requested. If the restoration of law and order is beyond local, county and state abilities, the Governor may declare a State of Emergency calling on federal support such as the North Dakota National Guard to assist in restoring order.

It is a continuing goal of the Bismarck Police Department to train officers to respond to civil disturbance situations in a professional and tactical manner. Officers are trained in Field Force Operations and Field Force Extrication Tactics from the Center of Domestic Preparedness in Anniston, Al.

# Vulnerability Assessment

Vulnerability: Characteristics of community assets that make them susceptible to damage from a given hazard.

	<b>Civil Disturbance</b>
<b>Probability</b>	Low
<b>Speed of Onset</b>	Limited or No Notice
<b>Geographic Area</b>	City-Wide, Statewide, Regional, or Nationwide
<b>Death / Injury</b> 1. Primary Causes  A. Highest vulnerability	1. Active Attack. (see Active Threat Hazard Profile)  A. Targeted groups such as government entities/employees, religions, and LGBTQIA population. B. First Responders (ie: law enforcement personnel) C. Densely populated areas (buildings or events)
<b>Mass Casualty Incident</b>	Possible
<b>Property Losses</b> (points of vulnerability – high priority)	Government Buildings Property owned by or catering to groups targeted for hate crimes.  Nearly all the past civil disturbances in North Dakota have resulted in property damage in the form of vandalism and trash.
<b>Environmental</b> (points of vulnerability – high priority)	Clean-up after a civil disturbance is often costly, and for events occurring in natural areas, like the Dakota Access Pipeline project, there may be environmental impacts from trash, human waste, and from humans degrading the land. For environmental protests, the primary grievance may be about the importance of the natural or cultural resource at risk
<b>COG/COOP</b> (points of vulnerability – high priority)	Law Enforcement All Government Entities
<b>Critical Facilities</b> (points of vulnerability – high priority)	Airport Hospitals/Clinics
<b>Critical Infrastructure</b> (points of vulnerability – high priority)	Damage to transportation, communications, or utilities infrastructure could further exacerbate the situation.
<b>Schools</b> (points of vulnerability – high priority)	Events may cause absenteeism from work/school based on concerns for safety
<b>High Risk Facilities (chemical)</b> (points of vulnerability – high priority)	Specific facilities, pipelines, or methods of transporting chemicals may be a target of protest or civil disturbance actions.
<b>Specific Populations:</b> Public Assembly, Vulnerable / Special Populations (points of vulnerability – high priority)	Places of Worship Government Buildings & Staff Protest sites
<b>Economy</b> (community-wide)	Events may cause absenteeism from work/school based on concerns for safety  During civil disturbances, businesses near the location of the disturbance usually cannot operate as they would in normal conditions, leading to loss of business locally. These businesses may face damages that require insurance claims and can alter business for short periods as they recover from the damage.
<b>OTHER:</b> (points of vulnerability – high priority)	

<b>Changes in Vulnerability</b> Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
No changes.	No changes. See Civil Disturbance Hazard Mitigation Capabilities listed in Section 3.

**Risk**

See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan.

**Relationship to other Hazards:** Active Threat and Civil Disturbance are closely related. One hazard may initiate the other. The occurrence of other hazards may contribute to the likelihood of Civil Disturbance event due to compounding stress and frustrations.

**Future Conditions**

- **Location:** The locations of potential Civil Disturbance events will remain the same, with the exception of additional location possibilities based on annexations into the city.
- **Extent/Intensity:** No change.
- **Frequency:** No expected change.
- **Duration:** No change.

**Anticipated Future Climate Impact – Active Threat Hazard**

Any number of things may cause a civil disturbance, whether it is a single cause or a combination of causes; however, most result from societal reasons such as economic hardship, social injustices, ethnic differences with long-standing oppression by a group of people towards another, objections to world organizations or certain governments, political grievances, and terrorist acts (USAR, 2005). Future climate projections through the end of the century do indicate the potential for increased societal insecurities and instabilities (Hoegh-Guldberg, 2018), including places like the Northern Great Plains region as exemplified by recent Dakota Access Pipeline (DAPL) civil disturbance (Powys-Whyte, 2016; Levin, 2016; EELP, 2023). In most such cases, climate conditions are not the direct cause of disturbance but may exacerbate underlying instabilities. *Source: 2024-29 ND Enhanced Mitigation Plan.*

## Previous Occurrences

Although Bismarck has not had significant Civil Disturbance incidents, protest events are common (as a protected first amendment right) and there is always some potential that actions of individuals or groups on either side of an issue can cause a protest event to escalate, resulting in civil disturbance.

Civil Disturbance Incidents within North Dakota illustrate the potential for Civil Disturbance events to occur in Bismarck. The following event descriptions are derived from the 2024-29 ND Enhanced Mitigation Plan.

- In 2016, North Dakota's most nationally recognized civil disturbance event involved controversy over the Dakota Access Pipeline (DAPL) (Johnson, 2016). While the pipeline was intended to connect the Bakken Oil Fields to Gulf Coast refineries (Hersher, 2017), protesters sought to protect sacred burial grounds and the Standing Rock Reservation's water supply.
- On May 30, 2020, peaceful demonstrations in Fargo in response to the George Floyd case in Minnesota turned violent with sunset. Individuals began to taunt police by throwing water bottles, smashing windows of local businesses, damaging vehicles, and setting a bonfire downtown. In response to the criminal actions, police deployed tear gas, and the mayor and governor declared emergencies (Associated Press, 2020). The City of Fargo estimated that the civil disturbance resulted in about \$842,000 in damages (Olson, 2020). At this time there were also protests and marches on the NDSU campus that impacted the university and students at the time.

## Building Security Risk Mitigation Recommendations

### Procedures:

- Conduct a realistic security assessment to determine the facility's vulnerability to an active assailant attack.
- Identify multiple evacuation routes and practice evacuations under varying conditions; post evacuation routes in conspicuous locations throughout the facility; ensure that evacuation routes account for individuals with special needs and disabilities.
- Designate shelter locations with thick walls, solid doors with locks, minimal interior windows, first-aid emergency kits, communication devices, and duress alarms.
- Designate a point-of-contact with knowledge of the facility's security procedures and floor plan to liaise with police and other emergency agencies in the event of an attack.
- Incorporate an active assailant/threat drill into the organization's emergency preparedness procedures.
- Vary security guards' patrols and patterns of operation.
- Limit access to blueprints, floor plans, and other documents containing sensitive security information, but make sure these documents are available to law enforcement responding to an incident.
- Establish a central command station for building security.

### Systems:

- Put in place credential-based access control systems that provide accurate attendance reporting, limit unauthorized entry, and do not impede emergency egress.
- Put in place closed-circuit television systems that provide domain awareness of the entire facility and its perimeter; ensure that video feeds are viewable from a central command station.
- Put in place communications infrastructure that allows for facility-wide, real-time messaging.
- Put in place elevator systems that may be controlled or locked down from a central command station.

### Training:

- Train building occupants (city-owned buildings and broader community) on response options outlined by ALERRT. <http://alerrt.org/>

**Avoid, Deny, Defend** These core concepts incorporate the response options of "Run, Hide, Fight," while providing for a more thorough explanation of additional response options within "Avoid, Deny, Defend."

# Cyberattack – Hazard Profile

## *Use of AI Tools Disclosure*

*This Cyberattack Hazard Profile has been written with the assistance of a Large Language Model (LLM). The resultant content has been reviewed for accuracy and necessary edits made prior to publication.*

## Description

A cyberattack is any offensive maneuver that targets computer information systems, infrastructures, networks, or personal computer devices, attempting to steal, alter, or destroy data or systems. These attacks can come in various forms, including malware, ransomware, phishing, denial of service (DoS), and advanced persistent threats (APTs). Attacks are often orchestrated by hackers, cybercriminals, or state-sponsored groups, who exploit vulnerabilities in digital systems to achieve their malicious objectives.

## General Types of Cyberattacks

- **Malware:** Malicious software designed to disrupt, damage, or gain unauthorized access to computer systems.
- **Ransomware:** A type of malware that encrypts a victim's data, demanding a ransom to restore access.
- **Unauthorized Access:** Fraudulent attempts to obtain sensitive information by disguising as trustworthy entities, stealing credentials, or otherwise accessing a secure system via unapproved or illegal methods.
- **Insider Attacks:** An individual with authorized access to an organization's systems or data intentionally or unintentionally uses that access to cause harm, such as stealing, altering, or destroying information.
- **Denial of Service (DoS):** Attacks that aim to make a machine or network resource unavailable to its intended users by temporarily or indefinitely disrupting services.

# Effects of Cyberattack on Local Government

Cyberattacks can have profound and far-reaching effects on local governments, disrupting essential services and undermining public trust. The impacts can be categorized into several areas:

## **Operational Disruption**

Cyberattacks can paralyze local government operations, including essential services such as emergency response, public safety, clean water, and waste management. This disruption can lead to delays in service delivery, compromised safety, and significant inconvenience to the community.

The following are some of the more impactful operational disruptions that could occur due to a cyber event:

## **Loss of clean water and wastewater systems**

Many modern water treatment and industrial systems use SCADA (Supervisory Control And Data Acquisition) to manage infrastructure. SCADA is often a target for attackers aiming to disrupt public services.

Examples of significant SCADA cyberattacks include the Stuxnet worm on Iran's nuclear program, the 2024 Russian attack on a water tower in Muleshoe, TX, and the 2021 Colonial Pipeline ransomware incident.

In a city like Bismarck, losing access to potable water could require a rapid government response and bottled water distribution. Similarly, compromised wastewater treatment could result in unsanitary conditions and the potential spread of disease.

## **Delayed 911 response times**

Public safety dispatchers and first responders use Computer Aided Dispatch (CAD) software for efficient and quick responses to 911 calls. The loss of CAD systems can delay emergency responses and create a backlog of administrative tasks, making emergency services less effective and potentially causing avoidable harm.

In July 2024, the ransomware incident in Cleveland, OH, necessitated that 911 dispatchers and field personnel operate using only paper and radio communication for weeks afterward. Although such procedures are routinely practiced in most agencies to prepare for system outages, maintaining this method over an extended period would require additional personnel to manage the same workload, potentially leading to employee burnout.

## **Administrative backlog**

When a cyberattack renders normal systems like asset tracking, documentation, financial processing, and email communications unusable, the resulting administrative backlog can severely hinder local government functions.

Essential tasks that depend on accurate and up-to-date records, such as budgeting, payroll, and resource allocation, become chaotic and error-prone. This breakdown in organization can delay critical decision-making processes, impede the delivery of public services, and magnify the impact of the initial attack.

Unable to rely on automated systems, staff must revert to manual methods, which are time-consuming and prone to mistakes, exacerbating the strain on already stretched resources. The cumulative effect of these disruptions can erode public trust and confidence in the government's ability to manage and respond effectively to crises.

### **Financial Impact**

The financial repercussions of a cyberattack can be substantial. Costs may include ransom payments, system restoration, data recovery, legal fees, identity theft protection, and increased cybersecurity measures. Additionally, there is often a loss of revenue due to interrupted services and diminished economic activity within the affected locality.

### **Data Breach and Privacy Concerns**

Local governments store vast amounts of sensitive data, including personal information of residents and employees, financial records, and official documents. A cyberattack can result in data breaches, exposing this information to unauthorized entities. This breach can lead to identity theft, financial fraud, and erosion of public confidence in the government's ability to protect its constituents' privacy.

### **Reputational Damage**

The reputational damage following a cyberattack can be significant. Public trust in the local government's ability to secure its digital infrastructure and protect citizens' information may decline, leading to long-term damage to the government's reputation and credibility.

## **Probability of Cyberattack on Local Government**

The probability of a cyberattack on local governments has been increasing steadily over the years due to several factors:

### **Increasing Digitalization**

As local governments continue to adopt digital technologies to improve efficiency and service delivery, the attack surface for cyber threats expands. More connected systems, online services, and digital records provide more entry points for cybercriminals.

### **Resource Constraints**

Many local governments operate with limited budgets and resources, often resulting in insufficient investment in cybersecurity. This lack of robust cybersecurity measures makes them attractive targets for attackers looking for easy prey.

### **Targeted Nature of Attacks**

Attackers often specifically target local governments due to the critical nature of the services they provide and the potentially high returns from successful attacks. The use of ransomware, for example, can yield substantial payouts, making local governments appealing targets.

### **Lack of Awareness and Training**

Cybersecurity awareness and training among local government employees are often inadequate. This lack of knowledge and preparedness increases the likelihood of successful phishing attacks and other social engineering tactics used by cybercriminals.

# Vulnerability Assessment and Applicable Mitigation Actions for Local Government IT Systems

A vulnerability refers to a flaw or weakness in a system that can be “exploited” to gain unauthorized access or cause harm.

Vulnerabilities are synonymous with “threat vectors”, which more specifically refer to the path in which a bad actor takes to accomplish their goal.

Below is a general list of the types of vulnerabilities/threat vectors that exist in an IT environment like the City of Bismarck. Accompanying each will be general best practices for *mitigating* (“dealing with”) that type of vulnerability.

The focus of the below mitigation actions is twofold:

1. Actions that **lessen the probability** of a successful cyberattack occurring
2. Actions that **reduce the potential impact** of a successful cyberattack

## Malware

Malware, short for malicious software, encompasses a variety of harmful programs designed to damage, disrupt, or gain unauthorized access to computer systems. This includes viruses, worms, trojans, ransomware, and spyware, each with its own method of infecting and compromising systems.

Here are some general **mitigation strategies** for malware threats:

- Do not allow users to install their own software (wherever possible).
- Implement a new software procurement/approval/vetting process.
  - Use a “sandbox” environment when testing new software.
  - Analyze online reviews, articles, and malware submission tools.
- Maintain a software inventory and review regularly for unwanted software
- Use reputable antivirus/antimalware software.
- Use intrusion detection (IDS/IPS) software to monitor systems and networks for unusual activity.

## Ransomware

Ransomware is a type of malicious software designed to encrypt a victim's files or lock them out of their system, demanding a ransom payment, typically in cryptocurrency, to restore access. Ransomware can cause significant disruption and data loss, as well as financial damage.

In addition to making files inaccessible, many ransomware gangs will “exfiltrate” (transfer outside of the secure environment) sensitive data and threaten to release or sell the data unless a ransomware payment is given. This extra step helps guarantee a payout from organizations that would otherwise just restore from known-good system backups.

The above list for mitigating malware risk is the best starting point for ransomware, but there are a few additional **mitigation actions** to add that are specific to this type of threat:

- Maintain a robust, 3-2-1 backup solution that provides protection against deleting or manipulating backups
  - Keep backup solutions physically and logically separate from production systems wherever possible
  - Regularly test restoring systems from backup
- Establish a working relationship with crucial third parties BEFORE a ransomware incident occurs, including:
  - Managed Security Service Providers (MSSPs)
  - Law enforcement/FBI
  - Cybersecurity insurance
  - Digital forensics professionals (often dictated by cyber insurance)
  - Governing bodies that must be reported to in case of breach (DOH, DOJ, TSA, CISA)

## Software Vulnerability

This is where malicious actors take advantage of flaws in software to gain access to a system.

In software, there are known vulnerabilities, often classified using the CVE (Common Vulnerabilities and Exposures) program, and there are unknown vulnerabilities, also referred to as “zero-day” vulnerabilities.

Some strategies for **mitigating known** software vulnerabilities include:

- Install software updates regularly as provided by the manufacturer (“patching”)
- Utilize scanning software to find and fix vulnerabilities
- Maintain a software inventory and patch management program
- Proactively plan for software and hardware lifecycles to prevent usage of unsupported or out-of-date software
- Stay up-to-date with the latest cybersecurity news and trends

Zero-day vulnerabilities are not yet known to the manufacturer, so all systems are vulnerable until it is found and reported, and a workaround or fix is deployed.

Some strategies for **mitigating zero-day** vulnerabilities are:

- Reduce the variety of software being used
- Reduce the amount of public-internet-facing services
- Only use actively supported software from reputable sources
- Use modern and secure coding practices when developing in-house software
- Adhere to the principal of least privilege wherever possible
- Use antivirus and intrusion detection (IDS/IPS) software to monitor systems and networks for unusual activity

## Physical Security

Computing assets must be protected from physical threats, not only human but also environmental, such as natural disasters, fire, or loss of HVAC or electrical power.

While humans can much more easily deploy malware or steal data when they have physical access to the computer, environmental effects most often cause Denial-of-Service (DoS) conditions.

Taking this one step further, bad actors can target dependencies like electricity or HVAC to bring down computer systems for the simple purpose of those services not being available to use.

Here are some **methods of protecting against physical security threats** to computing assets:

- Keep as much hardware and network behind lock-and-key as possible
- Implement a hardware inventory system.
- Establish device controls to track and wipe data on stolen or lost devices.
- Implement physical security systems like cameras, electronic locks, and perimeter fences.
- Provide redundant sources of electricity and HVAC to critical computing resources.
- Establish visitor/vendor escort procedures.

## Social Engineering

Social engineering is a manipulation technique that exploits human error to gain private information, access, or valuables. In the context of cybersecurity, it involves tricking individuals into breaking normal security procedures, often through deceptive means such as phishing emails, pretexting, tailgating, or shoulder-surfing.

## Phishing

Phishing involves fraudulent attempts to obtain sensitive information such as usernames, passwords, and credit card details by disguising as a trustworthy entity over email. These are made to appear legitimate but trick individuals into providing confidential information, install malware, or other malicious acts.

Similar terms were were coined for *smishing* and *vishing*, which refer to SMS (text) and voice solicitation, respectively.

## Spear Phishing

Officials in local government are especially targeted by what is called “spear phishing”. These are phishing attempts that are targeted at specific people and are far more difficult to identify as fraudulent.

Messages are sent as if from a trusted party, and addressed to the recipient, and made to look as legitimate as possible. Common examples are fake requests from employees to re-route paychecks, or fake emails from internal departments instructing the user to perform a malicious action.

## **Business Email Compromise**

Going one step further in more sophisticated Business Email Compromise (BEC) attacks, bad actors take direct control of a user's email account. The bad actor poses as the user and uses existing email conversations as a basis for compromising more accounts.

For example, if the user was expected to send a quote to their customer, the bad actor would hijack the existing email thread and reply with a fake quote, embedded with a malicious website link or malware. If the customer falls for this trick, the bad actor can then "pivot" into the customer's email box, and continue their path from there.

BEC attacks are very difficult to spot and have wide-ranging consequences from malware delivery to unauthorized disclosure of Personally Identifiable Information (PII).

## **The Role of AI in Phishing**

The use of AI LLMs (Large Language Models) to create phishing content has significantly complicated the detection of fraudulent activities. These advanced models can generate highly convincing and contextually appropriate messages that closely mimic legitimate communications from trusted entities. By leveraging vast amounts of data, AI LLMs can tailor spear-phishing attempts to specific individuals, making them appear more personalized and credible.

As a result, traditional methods of identifying phishing, such as spotting spelling errors or unusual language, are no longer as effective. This increased sophistication of phishing attempts necessitates more advanced detection mechanisms and a heightened awareness among individuals to recognize potential threats.

## **Pre-Texting**

Pretexting is a social engineering technique where an attacker fabricates a plausible scenario to manipulate a victim into divulging confidential information or performing specific actions. In the realm of cybersecurity, this often involves the attacker impersonating a trusted individual such as a colleague or IT support staff.

By creating a convincing narrative, the attacker can deceive the victim into revealing sensitive information such as passwords or account numbers. Pretexting is particularly dangerous because it exploits human trust and can bypass technical security measures, making it a highly effective tool for cybercriminals.

## Tailgating

Tailgating, in the context of cybersecurity, is a social engineering technique where an unauthorized individual gains physical access to a secure area by following closely behind a legitimate user without the user's knowledge or consent. This often occurs when an attacker takes advantage of common courtesy, such as holding the door open for the next person, to enter restricted spaces.

Once inside, the attacker can access sensitive areas, steal confidential information, or deploy malicious devices. Tailgating is particularly dangerous because it bypasses electronic security controls and relies on the exploitation of human behavior, making it a significant threat to organizational security.

## Shoulder Surfing

Shoulder surfing is a form of social engineering in cybersecurity where an attacker observes a victim's private information by peering over their shoulder. This method can occur in any public or semi-public space, such as offices, cafes, or airports, where individuals may access sensitive information on their devices.

By visually capturing passwords, PINs, or other confidential data, the attacker can gain unauthorized access to the victim's accounts or secure systems. Shoulder surfing exploits the human tendency to overlook the physical security of their surroundings, making it a persistent threat in protecting personal and organizational data.

## Credential Harvesting

Credential harvesting is a social engineering attack where cybercriminals collect and steal user credentials, such as usernames and passwords, through various deceptive methods. These techniques may include phishing emails, fake websites, or malicious software designed to capture login information. Once obtained, these credentials can be used to gain unauthorized access to systems, leading to data breaches, financial loss, and other security incidents.

### Mitigation Actions:

- Implement multi-factor authentication (MFA) to add an extra layer of security beyond just passwords.
- Educate employees on recognizing phishing attempts and credential harvesting methods.
- Use email filtering and web security solutions to block malicious emails and websites.
- Monitor and review login activities for unusual or suspicious behavior to detect potential credential theft early.

## Social Engineering Mitigations

Protecting against the human aspect of cybersecurity can be most difficult, since machines are (most often) better at interpreting instructions. It also costs more to educate the human populace than to configure technical computer controls.

A successful defense to Social Engineering attacks involves consistent, engaging training content, and strong policy to forward cyber education initiatives and hold people accountable when needed. Executive buy-in is crucial to continuing the effort over a long time period.

Here is a general list of **strategies to mitigate Social Engineering attacks**:

- Regularly conduct Cybersecurity Awareness Training with all employees, with a newfound emphasis on recognizing AI-generated content.
- Conduct regular phishing simulations and track effectiveness to guide education efforts.
- Implement multi-factor authentication (MFA) to add an extra layer of security beyond just passwords.
- Educate employees on recognizing phishing attempts and credential harvesting methods.
- Use email filtering and web security solutions to block malicious emails and websites.
- Monitor and review login activities for unusual or suspicious behavior to detect potential credential theft early.
- Establish clear organizational policy and procedure pertaining to:
  - Training requirements
  - Vetting of vendors, visitors, and unidentified employees
  - Approval workflows for divulging sensitive information
  - Consequences for not adhering to security policies

## Insider Threats

Insider attacks involve individuals within the organization who intentionally or unintentionally compromise security. These insiders can be disgruntled employees, contractors, or partners with access to sensitive information.

**Mitigating insider threats** requires a multi-faceted approach that focuses on preventive and detective measures.

- Implement strict access controls and monitor user activities.
- Conduct thorough background checks during the hiring process.
- Regularly review and update access permissions based on role changes.
- Establish a whistleblower program to report suspicious behavior confidentially.
- Provide continuous training on recognizing and reporting insider threats.
- Utilize behavior analytics to detect deviations from normal user activities.
- Enforce the principle of least privilege, ensuring employees have access only to the information necessary for their role.

## Advanced Persistent Threats (APTs)

Advanced Persistent Threats (APTs) are prolonged and targeted cyberattacks in which an intruder gains access to a network and remains undetected for an extended period. Unlike traditional attacks, APTs are highly sophisticated and often involve significant planning and resources, with the goal of stealing data or surveilling activities over time.

Nation-state APTs are particularly concerning because they are often orchestrated by government-backed groups with substantial resources and expertise. These actors typically target critical infrastructure, government agencies, and large corporations to gather intelligence, disrupt operations, or steal sensitive data for political, economic, or military advantage.

### Mitigation Actions:

- Implement advanced intrusion detection systems to monitor for unusual network activity.
- Regularly update and patch software to fix known vulnerabilities.
- Use multi-factor authentication to add an extra layer of security.
- Conduct regular security audits and vulnerability assessments.
- Educate employees about phishing and other common attack vectors.
- Segment networks to limit the spread of an intrusion.
- Develop and test an incident response plan to quickly address breaches.

<b>Changes in Vulnerability</b> Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
Cyberattack was not included in the previous Multi-Hazard Mitigation Plan.	Cyberattack was not included in the previous Multi-Hazard Mitigation Plan.

**Risk**

See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan.

**Relationship to other Hazards:** Cyberattack is an intentional human-caused hazard, and may relate to other human-caused hazards including Terrorism or Nation-State Attack. Cyberattack also relates to all hazards in that a cyberattack may impede ability to respond effectively, regardless of hazard type.

**Future Conditions**

- **Location:** No change.
- **Extent/Intensity:** The probability and potential impact of cybercrimes continue to expand as dependencies on technology continue.
- **Frequency:** The probability of a cyberattack in the state is increasing over time. Worldwide, ransomware attacks are launched every 11 seconds as of 2021, and that interval is expected to shorten to every two seconds by 2031. The United States is the preferred target of cybercriminals, receiving 46 percent of all attacks in 2021 (Brooks, 2022). It is highly probable that the state will be impacted by a cyberattack.  
*Source: 2024-29 ND Enhanced Mitigation Plan*
- **Duration:** No change.

**Anticipated Future Climate Impact – Cyberattack Hazard**

There is no known direct connection between cyberattacks and future climate conditions, though attackers may take advantage of inclement weather periods and other social, infrastructure, or economic stressors to mask or otherwise facilitate their attacks.

**Conclusion**

The probability of cyberattacks against local government is ever increasing, as local governments often manage critical infrastructure and sensitive data that are attractive targets. The impacts can be severe, ranging from disrupted public services to stolen confidential information, which can undermine public trust and compromise national security. It is imperative that local governments implement robust cybersecurity measures to mitigate these risks and protect their assets from sophisticated threats.

# Dam Failure – Hazard Profile

## Description

A dam is any artificial barrier, including appurtenant works, which impounds or diverts water. Dam failure is defined as a sudden, rapid, and uncontrolled release of impounded water that can create a potentially significant downstream hazard.

The storage capacity of Garrison Dam ranges from the 18-24 million acre-feet (Lake Sakakawea). The purpose of this dam includes storage of water for irrigation, hydroelectric power generation, flood control, water supply, recreation, and wildlife habitat. Should the dam fail, the consequences can be devastating.

Most dams are classified based on the potential hazard to life and property should the dam suddenly fail. Note the hazard rating is not an indicator of the condition of the dam or its probability of failure. The following hazard categories have been established for North Dakota according to the North Dakota Design Handbook (North Dakota State Engineer, June 1985:

**Low Hazard:** These dams are located where there is little possibility of future development such as rural or agricultural areas. Failure of low hazard dams may result in damage to agricultural land, township and county roads, and non-residential farm buildings. No loss of life is expected if failure occurs.

**Medium Hazard:** These dams are located in predominately rural or agricultural areas where failure may damage isolated homes, main highways, railroads, or cause interruption of minor public utilities. The potential for the loss of a few lives exists if the dam fails.

**High Hazard:** These are dams located upstream of developed and urban areas where failure may cause serious damage to homes, industrial and commercial buildings, and major public utilities. There is a potential for the loss of more than a few lives if the dam fails. (North Dakota State Engineer, 1985)

### High Hazard Dams affecting Bismarck

Dam Name	River	Location	Owner
Garrison Dam <i>Maximum storage: 23.8 million acre feet</i>	Missouri River	McLean County	US Army Corps of Engineers
Jackman Coulee Dam #2	Jackman Coulee	Bismarck	Bismarck
The Jackman Coulee Dam structure is required to pass a 0.5 PMP event without overtopping. PMP= Probable Maximum Precipitation. See page 4 and 5.			
Fort Peck Dam <i>Maximum storage: 19.1 million acre feet</i>	Missouri River	McCone County, Montana	USACE
Heart Butte Dam	Heart River to Missouri River	Grant County	Bureau of Reclamation

North Dakota Century Code § 61-03-25 requires and Emergency Action Plan for all high hazard and medium hazard dams. An EAP is developed for the Jackman Coulee Dam #2 , classified as a “high hazard dam.”

There are many potential causes for dam failure including hydrologic inadequacy, seepage related issues, structural problems, mechanical problems, operational errors, earthquakes, and terrorism. The causes behind a dam failure can be interrelated and complex. The most common causes of dam failure are hydrologic inadequacy and seepage related issues.

### **Hydrologic Failures**

Hydrologic failures are typically associated with flood events. A hydrologic failure may occur due to dam overtopping or excessive spillway erosion. A dam can be overtopped during a flood event due to insufficient reservoir storage and insufficient spillway capacity. Earthen dams are particularly susceptible to failure when overtopped since earthen material may erode relatively easily. Some dams have an earthen auxiliary spillway designed to carry excess flows during a flood event. Since these are earthen spillways, some erosion can be expected, but under the right conditions excessive erosion can occur. (North Dakota State Water Commission, 2007)

### **Seepage Failures**

All dams have some seepage occurring through the structure and foundation. Seepage, if uncontrolled, can erode material from the embankment of an earthen dam and lead to complete failure of the dam. Piping is a special seepage problem where erosion starts at the point where seepage is exiting the downstream slope or foundation, then works backwards toward the upstream slope. Internal erosion, another type of seepage failure, occurs when water flowing through the dam causes erosion along a crack in the embankment or foundation, or along some other discontinuity or preferential flow path in the embankment, such as along a spillway conduit. Tree roots and animal burrows can also provide paths for seepage. Seepage failures can occur during the course of normal operations, but can also occur during flood conditions when reservoir levels are abnormally high. (North Dakota State Water Commission, 2007)

## **Garrison Dam Profile**

(Source Data: US Army Corps of Engineers, Omaha District)

Garrison Dam is the fifth largest earthen dam in the world. It was constructed as part of the Pick-Sloan Plan for development of the upper Missouri River Basin. Construction of the \$294 million dam project began in 1947 and closure of the embankment occurred in April 1953.

### **Project Statistics**

The main features of Garrison Dam are the embankment power plant, spillway and outlet works. The embankment is 2-1/2 miles long and stands 210 feet high. The dam is 2,050 feet wide at the base and tapers off to 60 feet wide at the top. It contains 66.5 million cubic yards of earth fill and 1.5 million cubic yards of concrete.

### **Power Plant**

The power plant consists of five generating units with a total capacity of 515,000 kilowatts. These generators produce 1.8 to 2.6 billion kilowatt-hours of electricity a year. Electrical power is transmitted from the project through seven transmission lines to various substations and is marketed by Western Area Power Administration at the Watertown Dispatch Office in South Dakota.

### Intake

The purpose of the Intake Structure is to house the necessary hoisting equipment, gates and auxiliary equipment for the eight water tunnels. Five of the tunnels are for power generation and three are for regulating water releases.

- Height 249 Feet
- Length 540 Feet
- Width 170 Feet

The structure is 7 feet, 8 inches higher than the 18 story N.D. State Capitol building; its base slab is 540 feet long compared to the Capitol's 402 foot length. This structure regulates and directs water flow into the eight water tunnels. The water in the reservoir covers most of the structure, rising nearly to the top of the service bridge piers.

### Spillway

The purpose of the Spillway is to control the water level during an emergency situation. The Spillway has 28 gates. Each gate is 29 feet high by 40 feet wide. The total length of the Spillway is almost 3200 feet and was designed for a maximum discharge capacity of 827,000 cubic feet per second at an elevation of 1858.5 mean sea level (MSL). Water released through the gates can reach a speed of 75 miles per hour en route to the stilling basin. The spillway chute contains 42 acres of concrete 18 inches thick. The stilling basin at the end of the chute contains 20 acres of concrete up to a thickness of 5 feet.

**2011 Flooding:** *During this flood event, the spillway gates at Garrison Dam were opened for the first time since the dam was built in the 1950s. As of June 1, the Spillway was used to release flood waters. The maximum release was 151,000 CFS on June 25, 2011. While the dam was not in any danger of failure, the record water levels were an historic event. Garrison Dam is a high hazard dam on the Missouri River owned by the US Army Corps of Engineers.*

*Video: Garrison Dam Historic Spillway Gate Opening:*

<http://www.dvidshub.net/video/153064/garrison-dam-historic-spillway-gate-opening#.VAhr-fMo6Uk>

*Shortly before 8 a.m. on June 1, 2011, the U.S. Army Corps of Engineers opened the gates to pass flood waters for the first time from the Garrison Dam spillway. Seven gates were opened to the height of one foot each to release some 7,500 cubic feet per second of floodwaters. By Kevin Wingert, U.S. Army Corps of Engineers, Omaha District.*

### The Lake

Lake Sakakawea, formed behind Garrison Dam, is one of the largest man-made lakes in the United States, extending 178 miles from the dam northwest to Williston, N.D.

The lake averages between two and three miles in width and is six miles wide at its widest point. The maximum depth of the lake is 180 feet at the face of the dam. At normal operating pool (1850 feet mean sea level), the lake covers 368,000 acres, has 1,300 miles of shoreline, and can store nearly 23 million acre-feet of water. That amount of water would cover the entire state of North Dakota with about six inches of water. The drainage area of the lake is about 181,400 square miles.

Garrison Project Statistics:

<http://www.nwo.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/2034/Article/487634/garrison-project-statistics.aspx>

## Heart Butte Dam Hazard Profile

Source Data: <https://www.usbr.gov/projects/index.php?id=465>

The Heart Butte Unit of the Pick-Sloan Missouri Basin Program lies in scattered tracts along the Heart River from Heart Butte Dam to the Missouri River.

Heart Butte Dam dam is a homogeneous earthfill type, with a structural height of 142 feet and a crest length of 1,850 feet. It contains 1,140,000 cubic yards of earth materials. The dam is on the Heart River in Grant County approximately 18 miles south of Glen Ullin, North Dakota. The spillway is a morning-glory type, leading to a 14- foot tube with a capacity of 5,700 cubic feet per second. The outlet works consist of a gated tube with a capacity of 700 cubic feet per second. The reservoir has a total capacity of 223,646 acre-feet, of which 147,861 acre-feet are for flood control storage and 206,365 acre-feet are for surcharge. The lake has a surface area of 3,397 acres.

Heart Butte Dam and Reservoir are operated by the Bureau of Reclamation. The Western Heart River Irrigation Project is operated and maintained by the Western Heart River Irrigation District.

To assist in identifying potential impact, the Bureau of Reclamation has developed and mapped two scenarios: 1) Static Internal Erosion Failure and 2) Hydrologic Internal Erosion Failure.

The Static scenario is a “sunny day” failure (unexpected) with a normal reservoir elevation at 2064.5 feet which is the bottom sill elevation of the morning glory inlet. The Hydrologic scenario would be a dam failure during a major flood with the reservoir level at 2096 feet. The record high reservoir is 2086.2 feet set in 1952. More recently, the reservoir reached 2082.7 feet in April 2011 and 2076 feet in 2023.

**Potential Impact & Vulnerability:** Based on the Hydrologic Internal Erosion Failure scenario (worst case), the WasteWater Treatment plant would have concerns for access, but is not likely to experience flood impact to the critical facilities. Other areas impacted within Bismarck would include Pioneer Park, Dakota Zoo, Riverwood Golf Course, Atkinson Park, the drainage ditch up to Washington Street, and access to the Whispering Bay development.

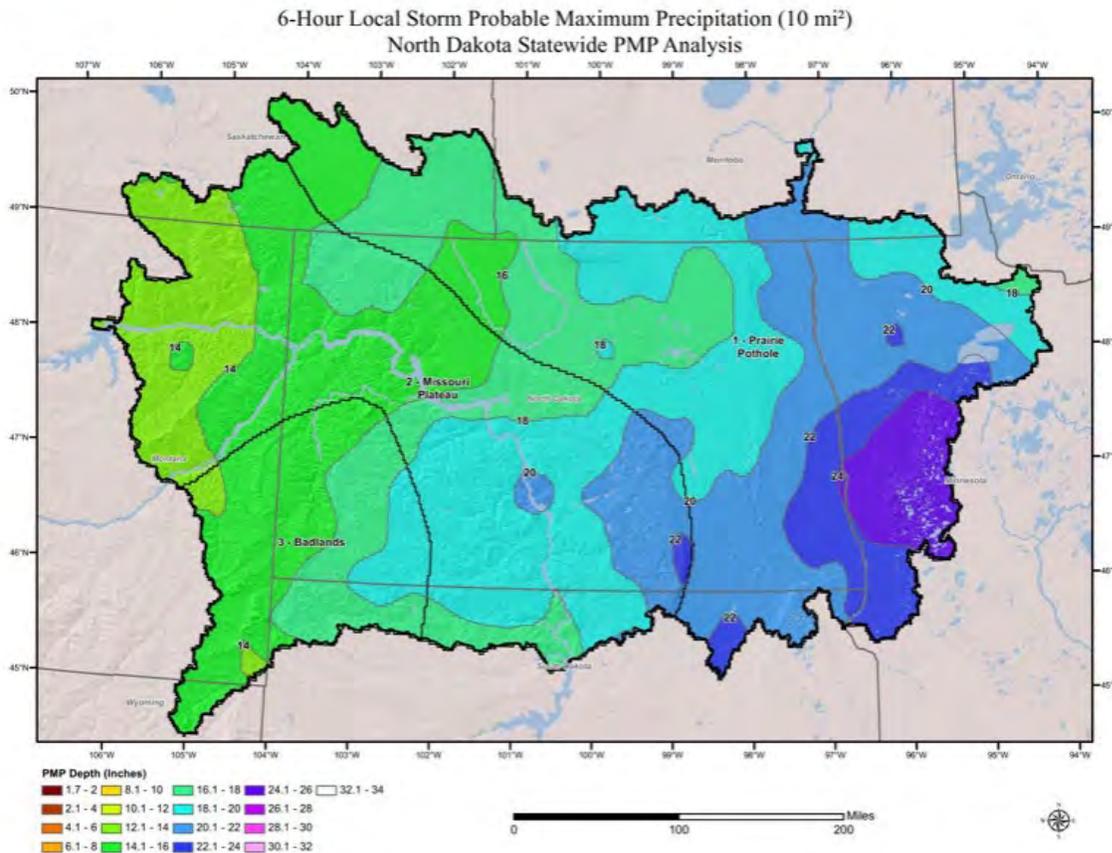
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**Probable Maximum Precipitation (PMP)** is defined by the Federal Emergency Management Agency as theoretically, *“the greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographical location during a certain time of year.”* The 50% PMP for Bismarck is as illustrated on the following page would fall within a range of 9 to 10 inches of rainfall within 6 hours. The 50% PMP is used as a requirement for design standards for dam construction (ex: Jackman Coulee Dam within Bismarck).

In June 2021, the ND Department of Water Resources completed an update of the statewide Probable Maximum Precipitation (PMP) data through a two-year PMP study.

The 2021 study supersedes Hydrometeorological Reports (HMRs) HMR-48, HMR-51, and HMR-52, which were derived in the 1970s and 1980s by the National Ocean and Atmospheric Administration, as best available PMP data in North Dakota. Results of the 2021 PMP study reflect the current standard of practice.

The new standards update the 1985 Dam Design Handbook with state-of-the-practice requirements and processes. They incorporate and replace DWR's 2016 Emergency Action Plan Guidelines and 2022 Probable Maximum Precipitation Guidance. Further, the standards integrate the 2023 Hazard Classification Review process from DWR's Hazard Classification and Legacy Dam Policy. Alongside this effort, the Hazard Classification and Legacy Dam Policy has been updated to remove the previous hazard classification review process and now focuses solely on the legacy dam process. To access the Probable Maximum Precipitation Study, see [https://www.swc.nd.gov/reg\\_approp/dam\\_safety/](https://www.swc.nd.gov/reg_approp/dam_safety/)



Source: Applied Weather Associates, 2021

Based on Table E.1 from the updated study as referenced, the anticipated probable maximum precipitation for the Bismarck area is reduced by approximately 19.8% compared to the previous data presented by the previous reports.

**Table E.1: Percent difference from HMR 51 PMP at 10-square miles. PMP depths are averaged over each transposition zone and represent the largest of all storm types.**

Mean 10 mi <sup>2</sup> PMP (max of all types) Percent Change from HMR 51 by Transposition Zone									
Transposition Zone	HMR 51 6hr	PMP 6hr	% Change 6hr	HMR 51 12hr	PMP 12hr	% Change 12hr	HMR 51 24hr	PMP 24hr	% Change 24hr
1	21.7	19.9	-8.5%	25.9	24.1	-6.8%	27.6	24.2	-12.3%
2	20.8	16.7	-19.8%	24.7	20.3	-17.7%	26.5	20.3	-23.2%
3	20.8	15.9	-23.2%	24.6	19.4	-21.2%	26.5	19.4	-26.6%

Table Source: Applied Weather Associates, 2021 The PMP depths are used in the computation of the Probable Maximum Flood (PMF), generally for the design of high-hazard structures.

# Vulnerability Assessment

Vulnerability: Characteristics of community assets that make them susceptible to damage from a given hazard.

Note: For vulnerability analysis relating to partial failure, see Flood Hazard – refer to 100 and 500 Year flood information.

Scenario	<b>Garrison Dam Catastrophic Failure</b>
<b>Probability</b>	Unlikely (THIRA rating)
<b>Speed of Onset</b>	10-23 Hours See page 13
<b>Duration</b>	7 days. Water may recede within about a week. Many years to recover.
<b>Geographic Area</b>	See maps: pages 14 - 16
<b>Death / Injury</b>	
1. Primary Causes	1. Drowning or “stranded” for a long period of time without necessary supplies and ability to communicate the need for help.
A. Highest vulnerability	A. Those who choose not to evacuate – or do not have the means to evacuate – and do not receive assistance. B. Those who do not receive warnings and other emergency public information in a timely manner. C. Prison Population – ND State Penitentiary
<b>Mass Casualty Incident</b>	Yes, potentially Catastrophic due to special populations requiring evacuation
<b>Property Losses</b> (points of vulnerability – high priority)	1. All Structures within affected area. See Dam Failure maps pages 13-15. See pages 6 -7 for loss estimates.
<b>Environmental</b>	1. All Structures within affected area – all contents and building materials contribute to environmental hazards 2. Debris / hazardous materials, contaminated flood waters

Scenario	<b>Garrison Dam Catastrophic Failure</b>
	<ol style="list-style-type: none"> <li>3. Septic systems</li> <li>4. Hazmat facilities</li> <li>5. Household hazardous materials released</li> </ol>
<b>COG/COOP</b>	<ol style="list-style-type: none"> <li>1. Bismarck PD</li> <li>2. Waste Water Treatment Plant</li> <li>3. Water Treatment Plant</li> <li>4. Public Works</li> <li>5. Public Health</li> <li>6. South Fire Station</li> <li>7. Employee / Family impact – availability of personnel</li> </ol>
<b>Critical Facilities</b>	<ol style="list-style-type: none"> <li>1. See COG/COOP above.</li> <li>2. See pages 8-9 for list of critical facilities.</li> </ol>
<b>Critical Infrastructure</b>	<ol style="list-style-type: none"> <li>1. All Critical Infrastructure within the inundated areas would be destroyed or inaccessible. See pages 10-11 for list of critical infrastructure within dam failure impact area.</li> </ol>
<b>Schools</b>	<ol style="list-style-type: none"> <li>1. All Schools south of Rosser. See page 9 for list of schools within dam failure impact area.</li> <li>2. Schools, if open, may be overwhelmed with additional student population. Many families, however, may have evacuated Bismarck and relocated to other communities.</li> </ol>
<b>High Risk Facilities (chemical)</b>	<ol style="list-style-type: none"> <li>1. There are approximately 145 facilities storing hazardous materials within the dam failure impact area. The majority are NOT Tier II facilities.</li> </ol>
<b>Specific Populations:</b> Public Assembly, Vulnerable / Special Populations	<ol style="list-style-type: none"> <li>1. Dakota Zoo – not likely to be able to relocate.</li> <li>2. Non-ambulatory population requiring evacuation assistance.</li> <li>3. State Penitentiary population.</li> <li>4. Bismarck Transition Center</li> <li>5. Crescent Manor</li> <li>6. Hospital (patient) population</li> </ol>
<b>Economy</b> (community wide)	Catastrophic – years/decades to recover
<b>OTHER:</b>	Estimated Population Displaced as a result of catastrophic dam failure: 25,000

Vulnerability for the Heart Butte Dam is discussed on page 4. Vulnerability relating to the Jackman Coulee Dam #2 is discussed on pages 17-20.

### Garrison Dam Failure - Inundation Map

Current mapping is now made available via the National Inventory of Dams.

<https://nid.sec.usace.army.mil/#/dams/system/ND00145/risk>

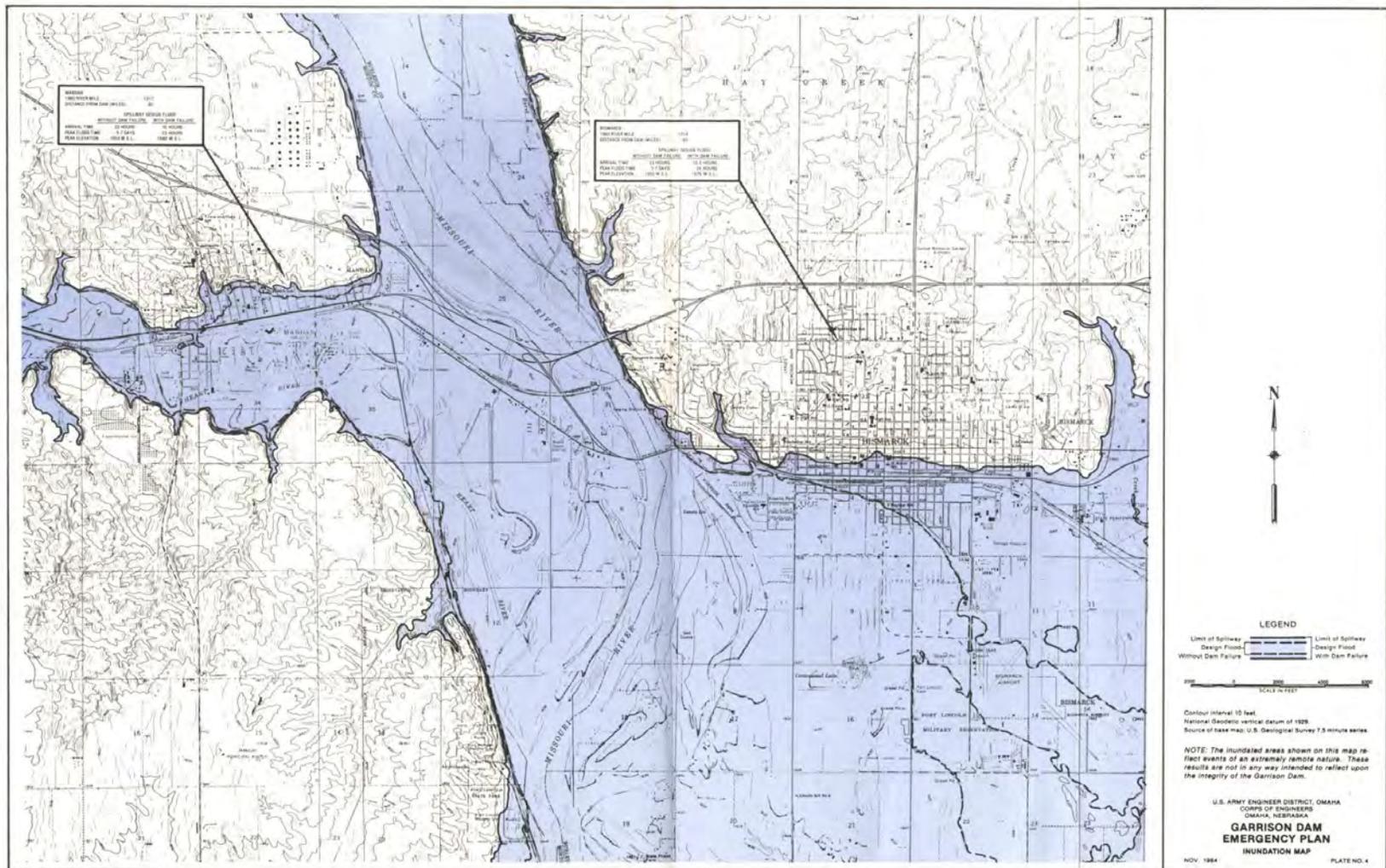
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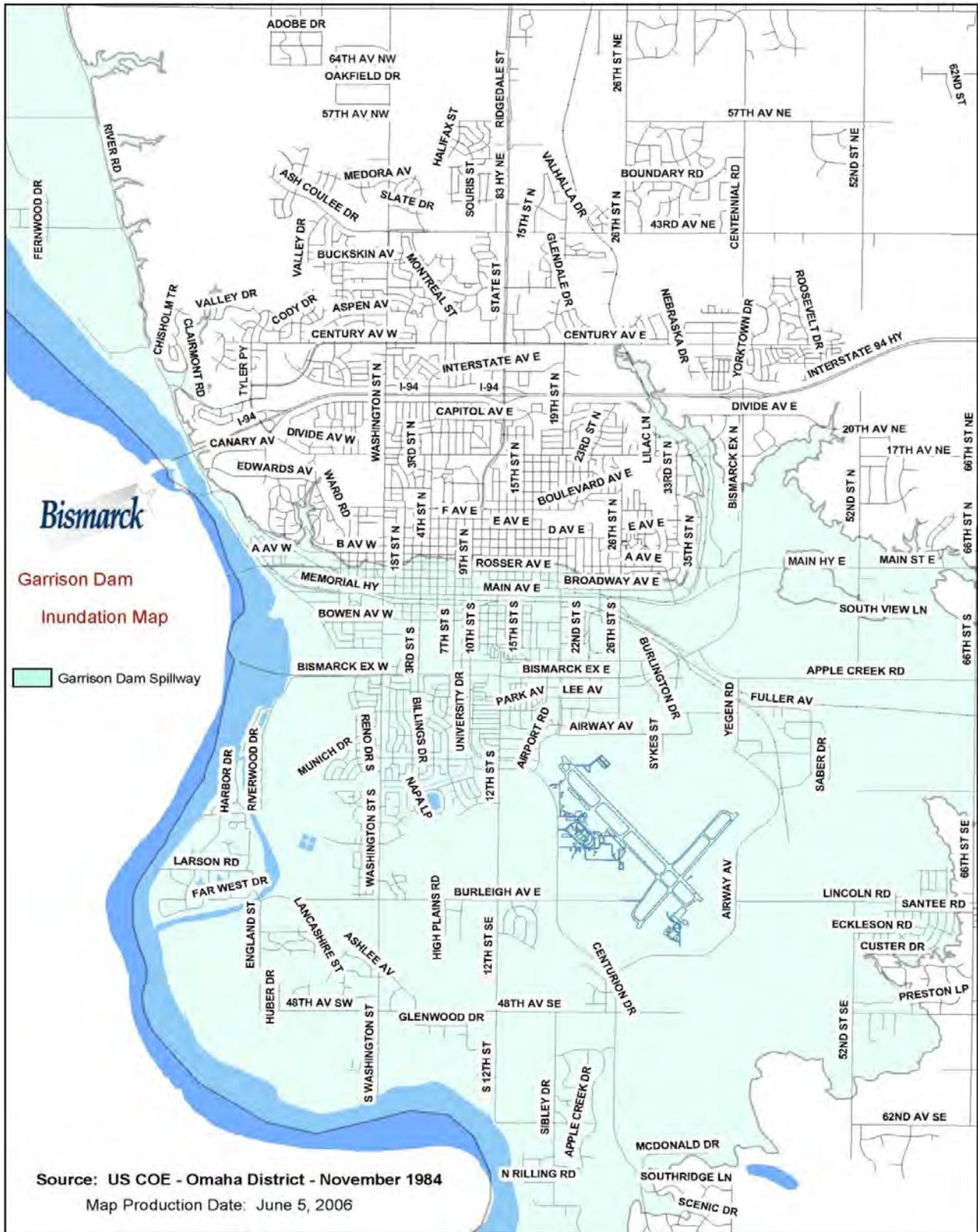
Note: The information below regarding the Garrison Dam Spillway and inundation maps on the following pages are intended to be used as a general guideline. The information and mapping regarding the Garrison Dam Spillway contained in this plan was developed by the US Army Corp of Engineers, Omaha District. The information and related maps were published in November of 1984. Changes in topography, new construction, and other various factors may influence or alter the data and inundation maps.

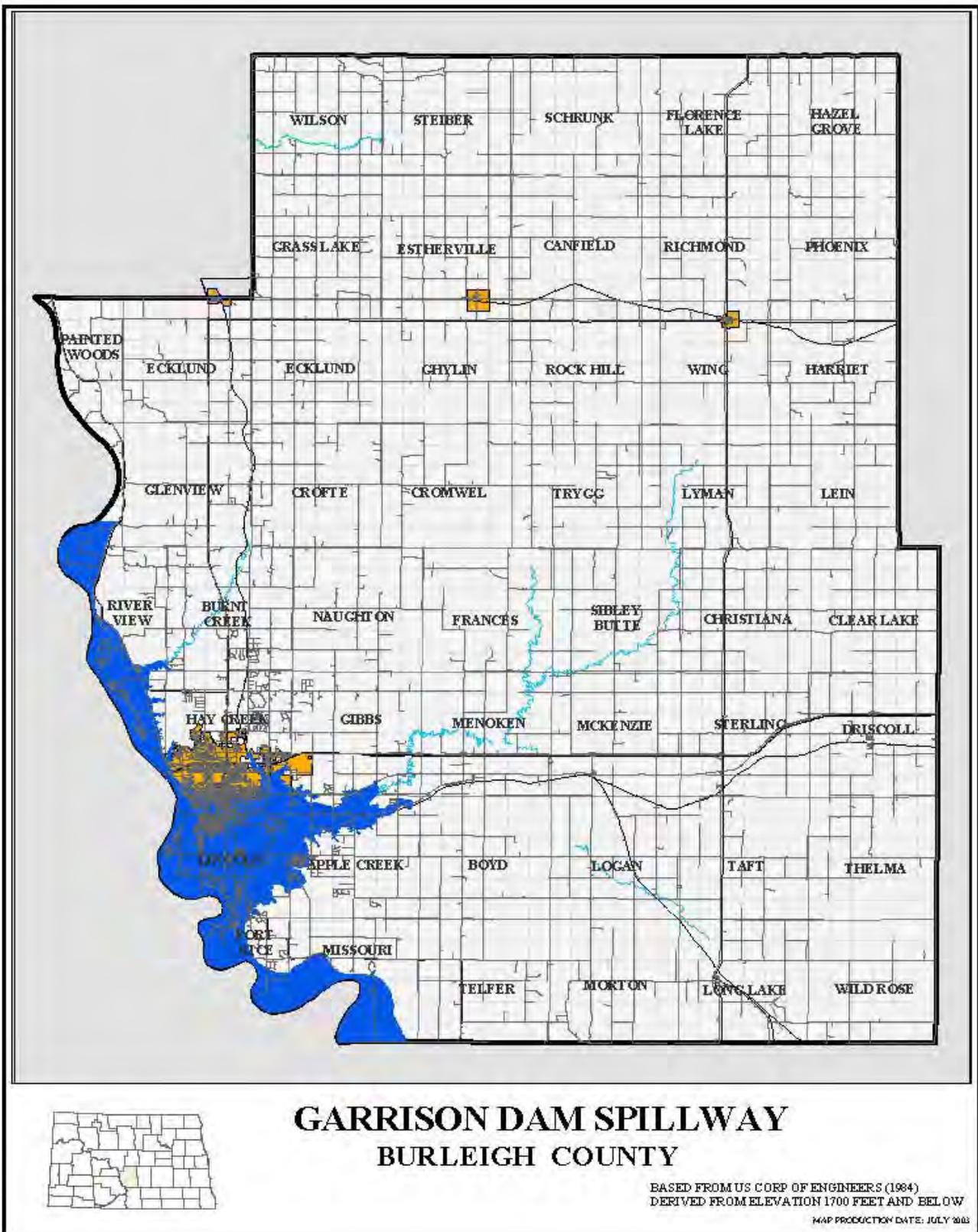
Bismarck  
 1960 River Mile: 1314  
 Distance From Dam: 65

#### Spillway Design Flood

	Without Dam Failure	With Dam Failure
Arrival Time	23 hours	10.3 hours
Peak Flood Time	5.7 days	24 hours
Peak Elevation	1650 MSL	1675 MSL







<b>CRITICAL FACILITIES</b>	
Within the Garrison Dam Failure Impact Area	
City of Bismarck	
Facility	Location
Bismarck Airport	2301 UNIVERSITY DR UNIT 17
Bismarck Event Center	315 S 5TH ST
Bismarck Police Department	700 S 9TH ST
City / County Office Building	221 N 5TH ST
Fire Station 2 - South	835 E BISMARCK
Public Health - Bismarck/Burleigh	407 South 26 <sup>th</sup> Street
Public Works	601 South 26 <sup>th</sup> Street
Burleigh County	
Burleigh County Courthouse	514 E THAYER AV
Burleigh County Social Services	316 N 5TH ST
Regional Jail (future development)	
State and Federal Government	
Air Guard	3410 AIRWAY AV
Federal Aviation Agency	2000 UNIVERSITY DR
Federal Building (old)	304 E BROADWAY AV
National Guard - Fraine Barracks	432 FRAINE BARRACKS RD
National Weather Service	2301 UNIVERSITY DR
ND Health and DEQ Lab	2635 E MAIN AV
ND Department Of Transportation	218 AIRPORT RD
ND Dept of Health Warehouse	1200 INDUSTRIAL DR, 2
ND DES	35 FRAINE BARRACKS RD
ND State Forensics	2637 E MAIN AV
ND State Lab	2641 E MAIN AV
Post Office	220 E ROSSER AV
State Penitentiary	3303 E MAIN AV
US Postal Processing & Distribution	2220 E BISMARCK EX
Medical and Emergency Services	
Family Practice Center UND	701 E ROSSER AV
Medical Arts Building	810 E ROSSER AV
Metro Area Ambulance South	1139 MEMORIAL HY
Mid Dakota Clinic	401 N 9TH ST
MRI Center	720 E ROSSER AV
Sanford Clinic	222 N 7TH ST
Salvation Army	601 S WASHINGTON ST
Sanford Clinic - South	1040 TACOMA AV
Sanford Health Center	300 N 7TH ST
Sanford Health Powerhouse	310 N 8TH ST
Sanford Health Warehouse	1112 S 12TH ST
CHI Hospital	900 E BROADWAY AV
CHI Purchasing / Warehouse	1300 INDUSTRIAL DR
Communications and Utility Facilities	
Century Link	220 N 5TH ST
MDU	909 AIRPORT RD
Public/Private Critical Facilities	
Bismarck Lumber	2200 E MAIN AV
Bismarck Public School Facilities & Transportation	705 S 9TH ST
Bismarck Transition Center	2001 LEE AV
Bismarck Tribune	707 E FRONT AV
Cash Wise Foods	1144 E BISMARCK
Community Access TV	307 N 4TH ST
Dan's Supermarket - South	835 S WASHINGTON ST
United Way (Shelter location) formerly Open Door	1140 South 12 <sup>th</sup> Street
Vitalent (formerly United Blood Services)	517 S 7 <sup>th</sup> St

<b>CRITICAL FACILITIES</b> Within the Garrison Dam Failure Impact Area	
Railroad Transportation Facility	
DMVW RR	3501 E ROSSER AV
Schools	
Victor Solheim Elementary South Central High School Dorothy Moses Elementary Jeanette Myhre Elementary Wachter Middle School St. Mary's Elementary United Tribes – Daycare United Tribes – Elementary School (2 buildings) United Tribes Technical College Prairie Rose Elementary Ascension Church School First Presbyterian Church – Daycare Noah's Ark Daycare Emmanuel Christian School ECLC Sanford College of Nursing Shepherd of the Valley School Super Kids Jr. Academy Shepherd of the Valley Preschool Hair Academy Angel Academy Discovery Daycare Preschool Program - House of Prayer	

<b>CRITICAL INFRASTRUCTURE</b> Within the Garrison Dam Failure Impact Area	
City of Bismarck	
Facility	Location
Wastewater Treatment Plant	601 W LONDON AV
Water Treatment Plant	615 RIVER RD
Sanitary Sewer Pump Station	100 E INDIANA AV
Sanitary Sewer Pump Station	2516 RIVER RD
Sanitary Sewer Pump Station	850 E WACHTER AV
Sanitary Sewer Pump Station	810 S 26TH ST
Sanitary Sewer Pump Station	3701 E BISMARCK EX
Sewer Lift Station	511 South Washington
Sewer Lift Station	1203 Memorial Highway
Sewer Lift Station	2200 South Washington
Sewer Lift Station	125 East Reno
Sewer Lift Station	525 West Reno
Sewer Lift Station	1740 South Reno
Sewer Lift Station	3108 Manchester Street
Sewer Lift Station	1700 River Road
Sewer Lift Station	3701 Morrison Avenue
Sewer Lift Station	300 Santa Fe
Sewer Lift Station	4053 Downing Street
Sewer Lift Station	3200 Rutland Drive
Lift Station	Boston Drive – South Bismarck
Transportation	
Bis-Man Transit	3750 E ROSSER AV
Communications	
Clear Channel Radio - KFYZ/Y93	3500 E ROSSER AV
CellularTower	2301 UNIVERSITY DR
CellularTower	WEST OF 2301 UNIVERSITY DR
Cell Tower	South 12 <sup>th</sup> Street
Utility	
MDU Operations	400 N 4TH ST
Montana-Dakota Utilities Bismarck Service Center	909 Airport Rd
Western Area Power Administration - Bismarck Substation	
Substation – South Washington Street	South of Burleigh Ave, North of Glenwood Dr.
4th and Front Substation	Front Avenue
Kirkwood Substation	South 7th Street and Arbor Avenue
Sweet Avenue Junction Substation	402 East Sweet Avenue
26th & Expressway Substation	26th Street and Expressway
Pipeline at Missouri River	WEST OF 4051 SANDY RIVER RD
Power Line at Missouri River	WEST OF 6948 BURNT CREEK LP
Power Line at Missouri River	WEST OF 5716 MISTY WATERS DR
Boat Ramps	
Fox Island Boat Ramp	NORTH OF 2650 MILLS AV
Grant Marsh Bridge Boat Ramp	NORTH OF 1103 RIVER RD
Bridge Locations	
Bridge: 3rd St over drainage ditch	SOUTHEAST OF 1922 S 3RD ST
Bridge: Bismarck Ex over Missouri River	BISMARCK EXPRESSWAY BRIDGE OVER MISSOURI RIVER
Bridge: Bismarck Ex over Railroad	WEST OF 3310 E BISMARCK EX
Bridge: east bound I-94 over Railroad	I-94 OVER RAILROAD
Bridge: Lincoln Rd over Apple Creek	WEST OF 5151 LINCOLN RD
Bridge: Main Av over Missouri River	WEST OF 100 RIVERSIDE PARK RD

<b>CRITICAL INFRASTRUCTURE</b>	
Within the Garrison Dam Failure Impact Area	
Bridge: Main Av over Washington St	WEST OF 311 W MAIN AV
Bridge: Railroad over 7th St	SOUTHWEST OF 705 E MAIN AV
Bridge: Railroad over 9th St	SOUTHWEST OF 901 E MAIN AV
Bridge: Railroad over Apple Creek	SOUTH OF 7301 APPLE CREEK RD
Bridge: Railroad over Main Av	SOUTH OF 906 MISSOURI AV
Bridge: Railroad over River Rd and Missouri River	NORTH OF 1103 RIVER RD
Bridge: Railroad over Washington St	NORTHWEST OF 260 W FRONT AV
Bridge: Riverwood Dr	2300 RIVERWOOD DR
Bridge: Rosser Av Over Hay Creek	NORTH OF 3605 E ROSSER AV
Bridge: Southport Lp	1500 SOUTHPORT LP
Bridge: Tavis Rd	3300 TAVIS RD
Bridge: University Dr Apple Creek	WEST OF 5701 APPLE CREEK DR
Bridge: Wachter over Drainage Ditch	800 WACHTER AV E
Bridge: Washington over Drainage Ditch	2201 WASHINGTON ST
Bridge: West Bound I-94 over Railroad	I-94 OVER RAILROAD
Railroad / Railroad Crossing Locations	
Railroad Crossing at 12th St	SOUTHEAST OF 1131 E MAIN AV
Railroad Crossing at 24th St	WEST OF 2407 RAILROAD AV
Railroad Crossing at 24th St	NW OF 2400 E FRONT AV
Railroad Crossing at 24th St N	SE OF 2321 E BROADWAY AV
Railroad Crossing at 26th St	SOUTHWEST OF 207 S 26TH ST
Railroad Crossing at 26th St	SE OF 210 S 26TH ST
Railroad Crossing at 26th St	EAST OF 114 N 26TH ST
Railroad Crossing at 3rd St	SOUTHWEST OF 1003 S 3RD ST
Railroad Crossing at 5th St	SOUTHWEST OF 113 S 5TH ST
Railroad Crossing at 66th St	NORTHEAST OF 1580 66TH ST SE
Railroad Crossing at 93rd St	NORTH OF 1800 93RD ST SE
Railroad Crossing at Airport Rd	SOUTHEAST OF 1833 E MAIN AV
Railroad Crossing at Divide Av	SE OF 3500 DIVIDE AV E
Railroad Crossing at Eastdale Dr	SW OF 109 EASTDALE DR
Railroad Crossing at Fraine Barracks	EAST OF 600 RIVER RD
Railroad Crossing at Front Av	EAST OF 2201 E FRONT AV
Railroad Crossing at Main Av	NORTH OF 2409 E MAIN AV
Railroad Crossing at Morrison Av	3810 MORRISON AV
Railroad Crossing at Railroad Av	SE OF 2516 RAILROAD AV
Railroad Crossing at Rosser Av	EAST OF 3422 E ROSSER AV
Railroad Crossing at Vermont Av	NW OF 2220 VERMONT AV
Railroad Crossing at Yegen Rd	EAST OF 1200 YEGEN RD
Railroad Crossing at Yegen Rd	SE OF 910 YEGEN RD
Railroad Over Hay Creek	EAST OF 3120 E CAPITOL AV
Railroad Over Hay Creek	SE OF 2920 E CAPITOL AV

<b>Bismarck Critical Facilities and Infrastructure Values</b>			
Note: Values identified in the table below are additional impacts beyond those identified within the previous table entitled "Impact Analysis – Catastrophic Dam Failure." Properties within this table are limited to those within the inundation area as mapped.			
<b>Group</b>	<b>Building Property</b>	<b>Personal Property</b>	<b>Outdoor Property</b>
Airport	\$31,374,921.00	\$1,247,496.00	\$70,186.00
Bis-Man Transit	\$6,115,317.00	\$152,965.00	\$0.00
Bismarck Public Health Center	\$6,137,221.00	\$749,215.00	\$0.00
Event Center	\$96,225,286.00	\$2,651,686.00	\$307,961.00
Emergency Management – EOC/CenCom	Relocated in 2020	Relocated in 2020	Relocated in 2020
Fire Department - South	\$2,992,131.00	\$802,723.00	\$0.00
Multi-Tenant Retail Building	\$1,657,072.00	\$0.00	\$0.00
Northern Plains Commerce Centre	\$561,762.00	\$13,147.00	\$0.00
Parking Authority	\$23,223,256.00	\$17,806.00	\$0.00
Police Department	\$9,421,669.00	\$1,161,392.00	\$924,004.00
Public Works	\$15,190,932.00	\$655,839.00	\$23,281.00
Wastewater Treatment Plant	\$7,909,929.00	\$4,838,887.00	\$436,457.00
Water & Sewer	\$4,402,943.00	\$0.00	\$0.00
Water Treatment Plant	\$47,112,487.00	\$316,050.00	\$233,100.00
<b>Totals</b>	<b>\$252,324,926.00</b>	<b>\$12,607,206.00</b>	<b>\$1,994,989.00</b>
<b>GRAND TOTAL</b>			<b>\$254,319,915.00</b>

Source: 2014-2015 State Fire and Tornado Insurance Data. Values reflect only properties within Dam Failure Spillway.

<b>Impact Analysis – Catastrophic Dam Failure</b>	
<i>Values within this table reflect 6,506 parcels of 7,376. The remaining 870 parcels are tax exempt properties and are not reflected in the totals within this table.</i>	
Land Value	\$447,683,000
Building Value Impact	\$1,628,219,000
<b>Total Property Impact</b>	<b>\$2,075,902,000</b>

Source: Bismarck GIS, 2014

Tax Exempt Property Values NOT included in the total above include parcels with the following designations: 5-year remodeling, blind, charitable, county, disabled person, disabled veteran, Federal, fire levy, graveyard, hospital or homes, lodges, municipal, municipal parks, new business, non-profit, paraplegic wheelchair, religious, school district, state assessed, state owned, homestead credit, payment in lieu of taxes, and renaissance zone project.

# Vulnerability Assessment

## Jackson Coulee Dam #2 (Tom O'Leary Golf Course)

The letter from Houston Engineering regarding Jackman Coulee Storm Water Facility Improvements and Tom O'Leary Storm Water Detention Applications dated September 4, 2002 describes the low probability: "...It seems appropriate to note the breach failures and methods requested are reflective of a catastrophic, or instantaneous, failure of both embankments simultaneously. Such failures would require these embankments to be fully saturated or have significant structural defects. The probability of a multiple breach is extremely remote since embankment saturation during events lasting six hours and a complete erosive failure event associated with spillway flows of three hours is unreasonable, though it is worst case. We understand these embankments are being held to a very high standard and in our opinion the proposed designs now comply with the required criteria. It is important to understand, however, that if all future and/or existing embankments, including roadways, are held to this level of jurisdictional authority or design criteria some may be impractical to construct and the cost to evaluate the potential failure impacts extensive..."

The inserted map on the following page identifies five residential properties at potential risk for flooding on either a 0.5 PMP (probable maximum precipitation) flood event or a 0.5 PMP flood event with a multiple breach. The 6 hour precipitation event for the 0.5 PMP is 10.7 inches.

The first residence is located on the west side of Jackman Coulee just to the west of Ward Road. The potential risks to this residence were determined using a selected channel section and a conveyance capacity rating based on downstream backwater conditions. This rating indicates the maximum elevation on a 0.5 PMP event, using a peak flow of 3,400 cfs, is approximately 1698.5 msl. The upstream elevation at Ward Road on this event is 1706.6 and would transition from the overflow back into the channel at this location. Using the City of Bismarck's 2-foot aerial topography was determined the ground level at this residence is at or above elevation 1704. While a finished floor elevation could not be determined this is a slab on grade structure. Based on a projected multiple breach peak flow of 5,355 cfs the water surface elevation in the channel increases to 1700.5 with the elevation over Ward Road at 1707.4. Again the projected water surface elevation in the channel at the residence is below the estimated floor elevation. The unknown, however, is the actual boundary of the transition from overflows on Ward Road into the channel. Reviewing the topography it appears there is a moderate risk for shallow water flooding to reach the north side of this residence on a multiple breach 0.5 PMP event.

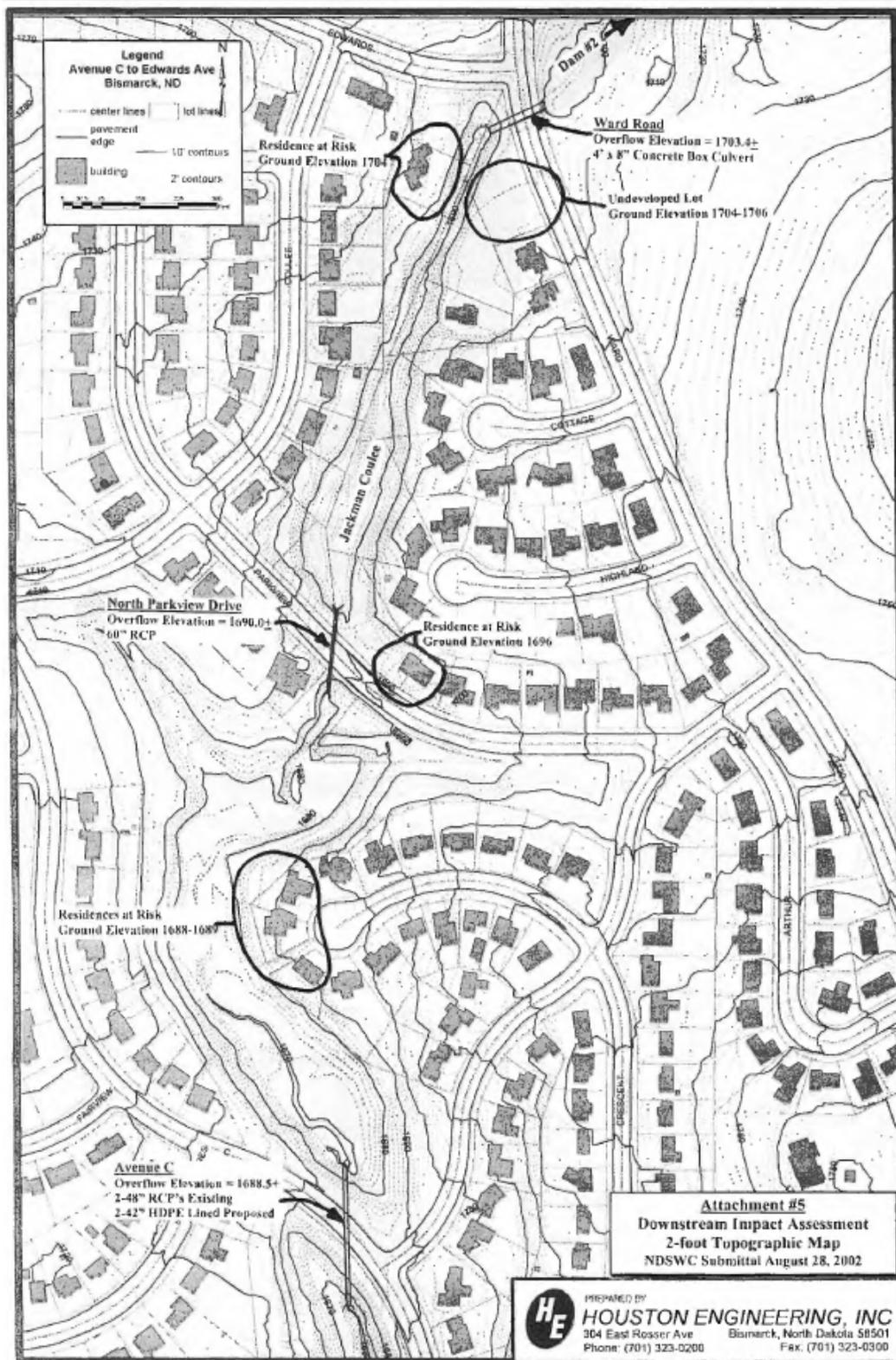
The second impact site is an undeveloped lot located on the west side of Ward Road south of the channel. This lot is not at risk for flooding on a 100-year event and has been removed from the current FIRM. This lot and any future residence are, however, at potential risk for flooding on events greater than the 100-year event, especially a 0.5 PMP or multiple breach event. While this lot and any future residence could be raised this action would restrict the overflows on Ward Road and flows around the structure into the channel would not be desirable. The City has been informed about this situation and will need to carefully consider the associated risks when reviewing any building permit request for this lot. The option to purchase this lot is should also be reviewed.

The third impact site is a residence located on the east side of Jackman Coulee just north of North Parkview Drive. The 0.5 PMP flood event and 0.5 PMP multiple breach flood event yielded elevations of 1693.7 and 1694.1 respectively at this crossing. Using the City of Bismarck's 2-foot aerial topography the ground level around this is residence was determined to be at or above elevation 1696. Therefore, this residence is not deemed at risk for flooding on these events.

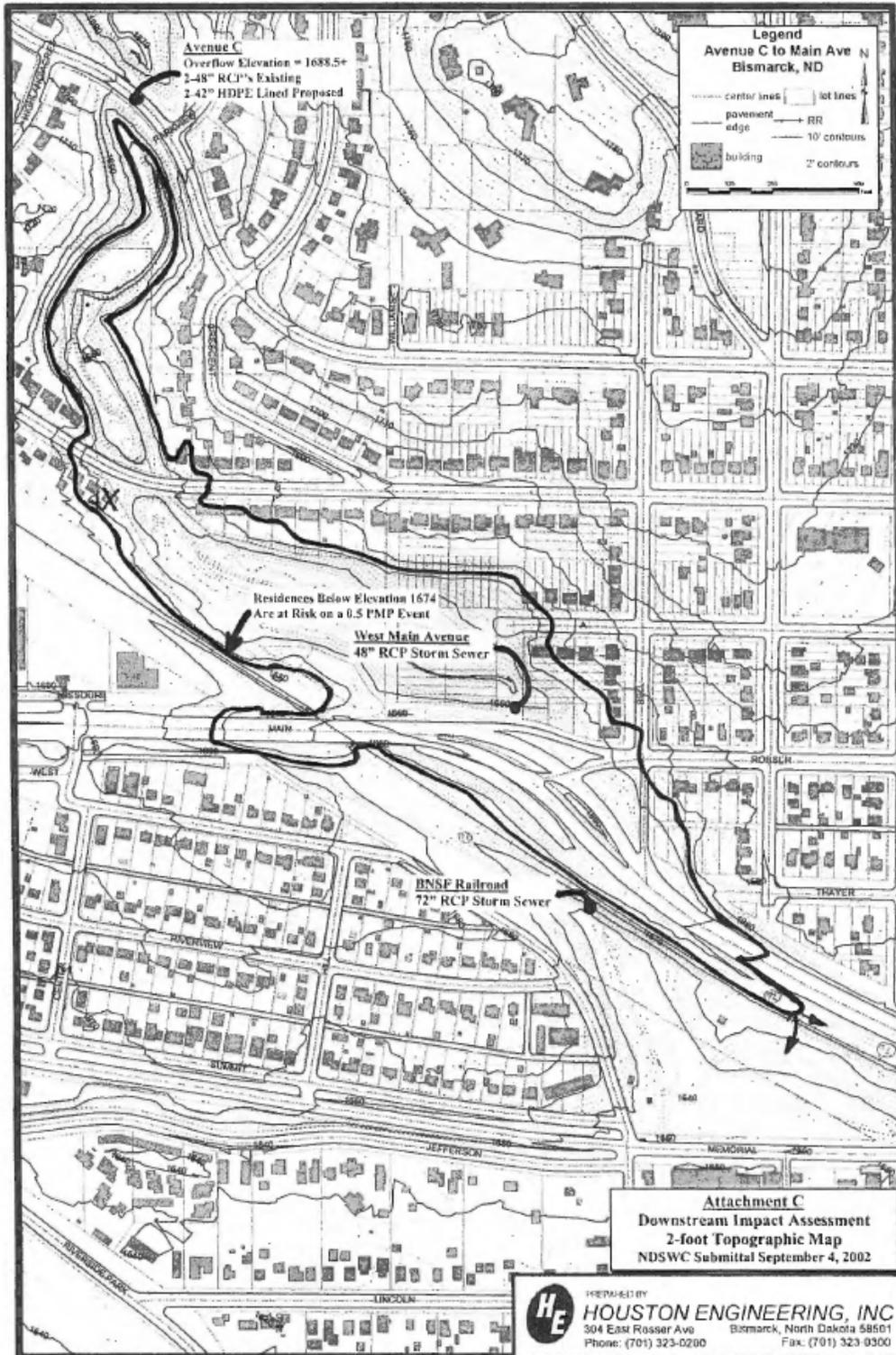
The fourth impact site contains three residences located on the east side of Jackman Coulee at the west end of Crescent Lane. Using the City of Bismarck's 2-foot aerial topography the ground level around these residences was determined to be between elevation 1688 and 1690. This potentially places the finished floor elevations of these walkout basements below the overflow elevation on Avenue C, which are approximately 1688.5. Based on the tables in Attachment #3 these residences are potentially first affected by shallow flooding on about a 500-year event under existing conditions, flood elevation 1688.3. They would however be provided additional protection under projected conditions, which lowers the 500-year flood elevation to 1685.8. In all cases these residences will be affected by floodwaters on events larger than a 500-year event. Since the 0.5 PMP flood event and 0.5 PMP multiple breach event yielded the same flood elevation at Avenue C the incremental impacts are deemed to be minimal. It should be noted that the most likely change would be a slight increase in the potential for shallow water flooding.

The next impact area is between Avenue C and West Main Avenue as illustrated within the inserted map labeled as "Attachment C." This is a confined storage area with a discharge capability limited to 350-450 cfs. Therefore, no matter when the floodwaters arrive from the 0.5 PMP event, breach overflows or not, the maximum flood elevation will not change appreciably as the total inflow volume is too significant to be discharged in a timely manner. Based on the City of Bismarck's aerial topography, the estimated overflow elevation at the BNSF railroad tracks or east along the south side of West Main Avenue is around 1672.5+. Using an estimated maximum water surface elevation of 1674, approximately twelve residences surrounding this area could be affected, most with shallow flooding with the exception basement impacts. Reviewing the path for overflows from Avenue C no residences will be impacted along the reach from Avenue C and Avenue B. The principal impact of all overflows will be from increased floodwater elevations from Avenue B south to West Main Avenue.

Jackman Coulee – Houston Engineering Attachment #5



Jackman Coulee Map Attachment C.



<b>Changes in Vulnerability</b> Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
<p>Both the Garrison Dam and the Heart Butte Dam have significant reconstruction, repair, and maintenance activities planned. Garrison Dam Reconstruction is planned to initiate in 2029 and will take several years to complete. Heart Butte Dam will initiate projects in 2027 and is anticipated to take two or three seasons to complete.</p> <p>Additional residential, commercial, and other properties have been constructed in south Bismarck within the inundation area of a Garrison Dam Failure.</p>	<p>CenCom (911 center) and the Emergency Operations Center have been relocated to north Bismarck, out of the inundation area.</p> <p>Future: The primary location of the Bismarck Police Department will be out of the inundation area prior to the next plan update.</p>

**Risk**

See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan.

**Relationship to other Hazards:** Flood, Terrorism or Nation State Attack, Severe Summer Weather and Winter Weather (heavy precipitation and snowmelt runoff). These hazards can contribute to the cause of a dam failure. Also, a failure of Fort Peck Dam (upstream of Garrison Dam) would have impact on the Garrison Dam.

A catastrophic dam failure would influence the potential for other hazards to occur include: Geologic Hazard, Hazardous Materials Release, Civil Disturbance, and Fire. Power outages are likely to occur even outside of the inundation area. Power normally generated by the dam would likely discontinue for a long period of time. Traffic over each of the bridges (including train bridge) would be discontinued for a lengthy period of time depending on impact, assessments, and repairs.

**Future Conditions**

- **Location:** The locations of potential impact will likely remain the same. Inundation mapping for both the Garrison Dam and Heart Butte Dam is not likely to change in the next five years.
- **Extent/Intensity:** See anticipated future climate impact below.
- **Frequency:** See anticipated future climate impact below.
- **Duration:** The duration of geologic hazards is not projected to change.

**Anticipated Future Climate Impact – Dam Failure Hazard**

The expected increase in size, intensity, and frequency of both drought and heavy precipitation episodes, or an increased frequency in change between drought and flood intervals may put more dams at risk of scenarios that exceed the original design criteria of each respective dam. Aging dams are most at risk for this expected impact.

## Previous Occurrences – Dam Failure

North Dakota does not have a history of significant dam failures within the state.

Dams that may impact Bismarck have no previous occurrences of failure.

The dam failure probability is somewhat low based on a minimal history of significant events and the regular inspection and upkeep of the high-hazard dams. Should a high or significant hazard dam fail, that event would be considered a high magnitude event. The loss of property, services, and even life could result.

# Drought – Hazard Profile

## Description

Drought is a condition of climatic dryness severe enough to reduce soil moisture below the minimum necessary for sustaining plant, animal, and human life systems. Drought characteristics usually include precipitation levels well below normal and temperatures higher than normal. Under these conditions, topsoil crumbles and is lost due to wind erosion. Streams, ponds, and wells often dry up and water levels in lakes and rivers drastically fall, creating severe strain on vegetation, wildlife, and livestock. Although the agricultural economy may be more negatively impacted, urban economies are also constrained when the amount of domestic and industrial water is in short supply. Prolonged droughts have caused severe economic hardships in North Dakota.

Scientifically, drought can mean many things to many people, depending on the discipline and perspective of the individual. Operational definitions are used to help quantify the beginning, end, and degree of severity of a drought. The following definitions were provided by the National Drought Mitigation Center.

**Meteorological drought** is usually an expression of precipitation's departure from normal over some period of time. These definitions are usually region-specific, and presumably based on a thorough understanding of regional climatology.

**Agricultural drought** occurs when there isn't enough soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought happens after meteorological drought but before hydrological drought. Agriculture is usually the first economic sector to be affected by drought.

**Hydrological drought** refers to deficiencies in surface and subsurface water supplies. It is measured as streamflow and as lake, reservoir, and groundwater levels. There is a time lag between lack of rain and less water in streams, rivers, lakes, and reservoirs, so hydrological measurements are not the earliest indicators of drought. When precipitation is reduced or deficient over an extended period of time, this shortage will be reflected in declining surface and subsurface water levels.

**Socioeconomic drought** occurs when physical water shortage starts to affect people, individually and collectively. Or, in more abstract terms, most socioeconomic definitions of drought associate it with the supply and demand of an economic good.

Drought effects regarding agriculture depend on time of year, timing of precipitation, amount of stored soil moisture, type of crop, stage of growth, and meteorological variables such as temperature, humidity, and wind. Precipitation deficits as little as four to six inches can cause severe agricultural drought conditions.

A wide range of possible social and economic consequences normally occurs during a prolonged drought. The effects of drought first strike individual farmers and ranchers, who suffer loss of income, increased indebtedness, possible bankruptcy, and dislocation. Regionally, drought can cause increased unemployment, economic disruption, migration intensity, and regional instability. A nation may be affected by increased government payments to the

agricultural sector, foreign trade losses, rising prices, food shortages, and health problems. Worldwide effects include severe health problems, disruption of world social systems, international conflict, starvation, and famine.

Hydrological droughts affecting tourism/recreation, energy development, food processing, and other industries are usually related to surface water levels in area lakes and rivers that serve as water sources. Reduced water levels can lower production and threaten the ability to produce energy at an acceptable rate, thus, having significant economic ramifications. Water-related recreation can become less desirable or even impossible with the effects of such extending into the economic well-being of tourism and recreation businesses.

A number of secondary hazards are generally associated with drought. Rural grassland fires increase due to dry vegetation. Reduction in vegetation will expose the soil to wind erosion. Reduced flow characteristics adversely affect chemical quality of lakes and rivers. Sediment transport regimes in streams and rivers are altered. Deterioration of water quality results in injury and death to plants and animals. Stagnant pools along rivers provide favorable habitat for insects, particularly mosquitoes. When normal rain patterns develop, the dry, unstable topsoil becomes vulnerable to gullies and flooding.

Effects of drought accumulate slowly but tend to persist over long periods. Determining whether conditions warrant drought status versus an extended dry spell is difficult and experts often disagree. However, a typical drought in North Dakota would most likely begin with limited winter snowfall, deficient spring precipitation accompanied by warmer than normal temperatures and windy conditions. At this point, normal spring greening does not occur causing a shortage of natural livestock feed. Spring planting plans most likely change. Fire danger to grasslands begins to increase. Growth and production of cash crops and feed grains become questionable. Continued drought negatively affects farm income, ultimately affecting agriculture-related businesses. Besides crop loss, recreational opportunities are reduced and hydroelectric power production is affected. Drought causes serious economic problems for the entire State of North Dakota.

## Extent (drought indices)

Drought is usually a regional hazard and any part of the state could be impacted in any given year. Mapping of the current drought status is published by the US Drought Monitor each Thursday at <https://droughtmonitor.unl.edu/>. North Dakota also has an extensive network of ground monitoring wells and surface water gauges. Ground water information, including hydrographs, recent water levels and chemistry conditions, can be found at <http://mapservice.swc.state.nd.us/> Daily streamflow conditions are maintained by the US Geological Survey and can be found at <http://waterdata.usgs.gov/nd/nwis/rt>.

Several drought indices are used to measure a drought’s severity and any combination of these indices and others may be used to trigger a wide variety of response activities by governments, individuals, and organizations.

The table below lists the more common indices and their use.

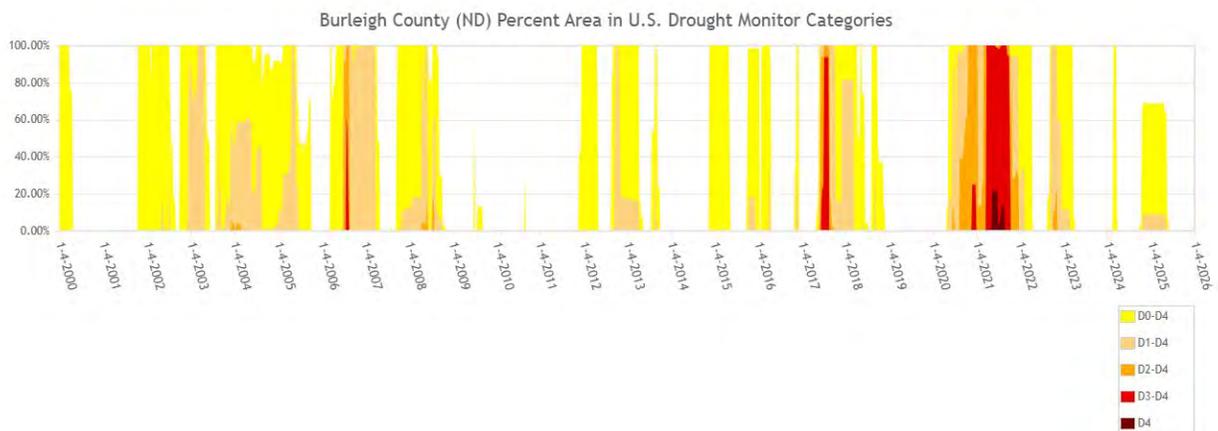
Drought Index	Description
<b>Keetch Byram Drought Index (KBDI)</b>	Used for wildfire risk potential, based on daily water balance including soil moisture
<b>Percent of Normal Precipitation</b>	Simple calculation to describe precipitation anomalies
<b>Standardized Precipitation Index (SPI)</b>	Used by the National Drought Mitigation Center and the Western Regional Climate Center; more complex calculation of a deviation from normal
<b>Weighted Anomaly Standardized Precipitation (WASP)</b>	A NOAA measure best applied to tropical areas
<b>Crop Moisture Index (CMI)</b>	A NOAA measure that measures week-to-week impact on seasonal crop and field activities
<b>Drought Reconnaissance Index (DRI)</b>	A measure common in United Nations data based on monthly comparisons
<b>Palmer Drought Severity Index (PDSI)</b>	Used by NOAA to measure long-term drought conditions in the past.
<b>United States Drought Monitor (USDM)</b>	The most widely referenced NOAA index, measures the persistence as well as severity of drought
<b>Quick Drought Response Index (QDRI)</b>	A NOAA measurement of short-term dryness over a 2-week period to identify the onset or expiration of drought
<b>Soil Moisture Anomaly (SMA)</b>	A NOAA measurement that evaluates total soil moisture conditions
<b>Normalized Difference Vegetation Index (NDVI)/Temperature Condition Index (TCI)/ Vegetation Condition Index (VCI)</b>	NOAA Satellite imagery used to evaluate

Table Source: ND Department of Emergency Services 2024-2029 Enhanced Mitigation Plan

### Standard Precipitation Index

Category	Description	Example Percentile Range for Most Indicators	Values for Standard Precipitation Index and Standardized Precipitation-Evapotranspiration Index
None	Normal or wet conditions	30.01 or Above	-0.49 or above
D0	Abnormally Dry	20.01 to 30.00	-0.5 to -0.79
D1	Moderate Drought	10.01 to 20.00	-0.8 to -1.29
D2	Severe Drought	5.01 to 10.00	-1.3 to -1.59
D3	Extreme Drought	2.01 to 5.00	-1.6 to -1.99
D4	Exceptional Drought	0.00 to 2.00	-2.0 or less

The following chart illustrates location (percentage of area within Burleigh County), probability (frequency/likelihood), and magnitude (scale) of drought conditions.



Based on the updated Drought **Impact Reporter Dashboard** (National Drought Mitigation Center, University of Nebraska), there have been no additional drought impacts for Bismarck/Burleigh since the 2020 plan update.

<https://unldroughtcenter.maps.arcgis.com/apps/dashboards/46afe627bb60422f85944d70069c09cf>

The National Drought Mitigation Center dashboard being phased out provided only one impact from the timeframe of January 2020 to June 2025:

#### Prayers for rain in Bismarck, North Dakota

Dates of Impact: 2021-04-11 to unknown

**Summary:**

Leaders at a Bismarck church organized a communitywide prayer effort to pray for rain to end the drought in North Dakota. The Bismarck Tribune (N.D.), April 17, 2021

**Affected Area(s):** Bismarck, ND

**Categories:**

- ◆ Relief, Response & Restrictions
- ◆ Society & Public Health

**Sources:** Media

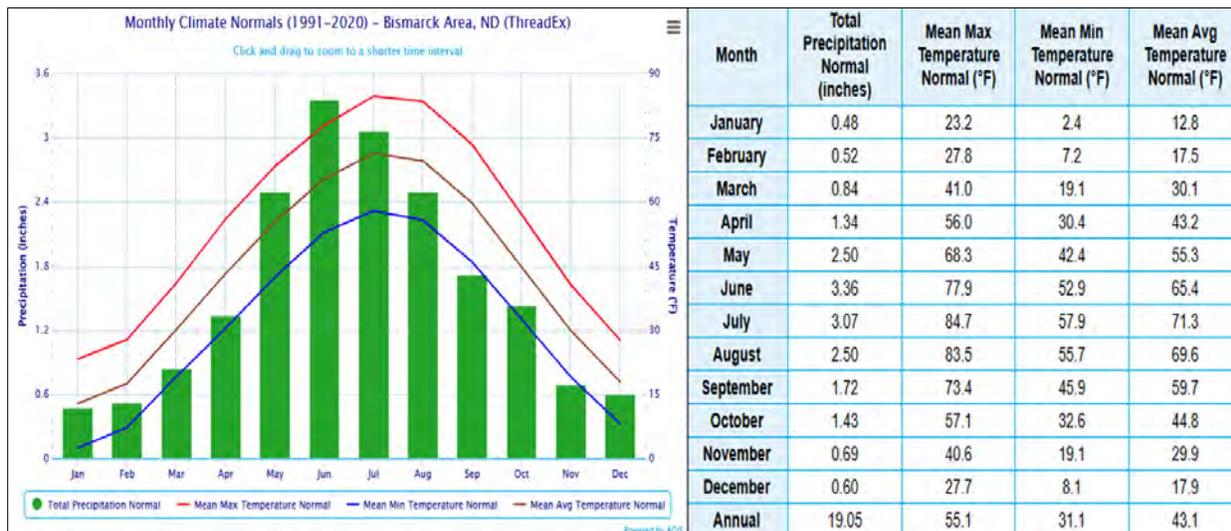
Source: <https://droughtreporter.unl.edu/advancedsearch/impacts.aspx>

### Bismarck Water Supply – Voluntary Water Restrictions Implemented

Bismarck has had voluntary lawn watering restrictions in the last 20 years. These restrictions have been based on reduced capacity due to construction and repair of infrastructure, or higher demands for lawn watering. In the drought conditions of 2019, there were no issues with water supply. Voluntary water restrictions were put in place on the following dates:

- July 26, 2018
- June 5, 2017
- June 18, 2014
- June 1, 2010
- July 22, 2008
- August 7, 2006

The diagram below shows the average monthly precipitation and the range of monthly average high and low temperatures for the Bismarck area during the most recent 30-year climate normal period, 1991-2020 ([XM-ACIS](#), 2025; [Climate Toolbox](#), 2024).



# Vulnerability Assessment

Vulnerability: Characteristics of community assets that make them susceptible to damage from a given hazard.

	<b>Drought</b>	<b>Extreme Drought</b>
<b>Probability</b>	Likely	Possible
<i>Drought is a recurring feature of nearly every climate on the planet. In many parts of the world, including North America, we have very little ability to predict exactly when drought will happen next. But if we look at history and climate data, we can be sure that drought will happen again at some point. Source: National Drought Mitigation Center</i>		
<b>Speed of Onset</b>	Slow. Warning time is up to a year	Slow. Warning time is up to a year
<b>Duration</b>	Weeks, Months, Years	Months, Years, Decades
<b>Geographic Area</b>	Multiple counties or States	Multiple counties or states
<b>Death / Injury</b>		
1. Primary Causes	1. Heat Wave	1. Heat Wave 2. Dust 3. Stress / Depression /Suicide/violence 4. Lack of Food / Nutrition
A. Highest vulnerability	A. Elderly and young – based on lack of cooling (HVAC) indoors or excessive outdoor activity	A. Elderly and young B. Those with lung / health issues C. Farmers, agricultural workers, others impacted greatly by economic impact D. Economically disadvantaged E. Increased risk to first responders due to heat stress F. Outdoor workers (construction, etc.)
<b>Mass Casualty Incident</b>	Unlikely	Possible, but not likely to require mass casualty response
<i>In the United States, a well-developed economy and agricultural system generally protect citizens from the most critical effects of drought such as shortages of food and water. However, drought still causes extreme hardship for farm and ranch families, and individual wells may run dry. Source: National Drought Mitigation Center</i>		
<b>Property Losses</b> (points of vulnerability – high priority)	Not likely	1. Abandoned property due to economic issues faced by individual families 2. Properties at Wildland/Urban Interface (due to increase in fire)
<b>Environmental</b>	1. Soil Erosion 2. Lower Lake & River levels	1. Soil Erosion 2. Lower Lake/river levels 3. Increase in turbidity and salinity levels 4. Air Quality (dust / pollutants increase) – decreased visibility 5. Loss of wetlands 6. Loss of vegetation 7. Loss of fish and game habitat 8. Stressed vegetation and wildlife more vulnerable to disease 9. Insect infestations 10. Plant infestations

	Drought	Extreme Drought
<b>COG/COOP</b>		
<b>Critical Facilities</b>		
<b>Critical Infrastructure</b>	<ol style="list-style-type: none"> <li>1. Water Restrictions may be necessary</li> </ol>	<ol style="list-style-type: none"> <li>1. Diminished food supply and increase in food prices</li> <li>2. Strain on financial institutions</li> <li>3. Commercial Food Service Operations</li> </ol>
<b>Schools</b>		
<b>High Risk Facilities (chemical)</b>		
<b>Specific Populations:</b> Public Assembly, Vulnerable / Special Populations		<ol style="list-style-type: none"> <li>1. Farm Families</li> <li>2. Elderly/Young</li> <li>3. Increase in Respiratory Ailments</li> <li>4. Economically disadvantaged (higher food prices)</li> <li>5. Agribusiness employees</li> </ol>
<b>Economy</b> (community wide)	<ol style="list-style-type: none"> <li>1. Agricultural businesses Impacted</li> <li>2. Tourism – loss of revenue</li> <li>3. Recreational facilities / businesses impacted</li> </ol>	<ol style="list-style-type: none"> <li>1. Agricultural businesses impacted</li> <li>2. Tourism – loss of revenue</li> <li>3. Recreational facilities / businesses impacted</li> <li>4. Industrial Users               <ol style="list-style-type: none"> <li>a. Energy production (i.e.: use of water for cooling or hydro-electric power)</li> <li>b. Those that draw directly from the river</li> </ol> </li> <li>5. Financial Institutions</li> <li>6. Transportation</li> <li>7. Unemployment</li> <li>8. Loss of Property Tax revenues</li> <li>9. Out-migration of affected residents</li> </ol>
<b>OTHER:</b>	<ol style="list-style-type: none"> <li>1. Increased risk of fire</li> <li>2. Migration of wildlife animals to urban areas seeking food/water (and potential for disease)</li> </ol>	<b>Public Safety Concerns:</b> <ol style="list-style-type: none"> <li>1. Conflicts over water / water use / water rights</li> <li>2. Increased risk of fire</li> <li>3. Firefighting and issues related to requirements for water (quantity / pressure)</li> <li>4. Migration of wildlife animals to urban areas seeking food/water (and potential for disease)</li> </ol>

<b>Changes in Vulnerability</b> Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
New development and increase in population create additional demand for water.	See Drought Hazard Mitigation Capabilities listed in Section 3.

<b>Risk</b>
<p>See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan. The Risk Assessment for this hazard (in Section 10) is based on D4 Exceptional Drought conditions.</p> <p><i>D4 Exceptional Drought Exceptional and widespread crop or pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.</i></p> <ul style="list-style-type: none"> <li>• <i>Palmer Drought Index -5.5 or less</i></li> <li>• <i>Standard Precipitation Index -2.0 or less</i></li> <li>• <i>CPC Soil Moisture Model 0-2 percentile</i></li> <li>• <i>USGS Weekly Streamflow 0-2 percentile</i></li> <li>• <i>Objective Short and Long-term Drought Indicator Blends 0-2 percentile</i></li> </ul>

The FEMA **National Risk Index** <https://hazards.fema.gov/nri/map> places Burleigh County (including Bismarck) as

- Drought Risk Index: Very Low
- Estimated Annual Loss: Very Low
- Social Vulnerability: Relatively Low
- Community Resilience: Very High

**Relationship to other Hazards:** Drought increases risk for Wildland Fire (Wildland Urban Interface). Drought conditions can impact soil ability to absorb precipitation, ultimately contributing the potential for geologic hazards. Flooding, flash flooding and high wind events *following a drought event* can increase the level of impact of those hazards. Drought can also affect likelihood or impact of Pest Infestation hazard.

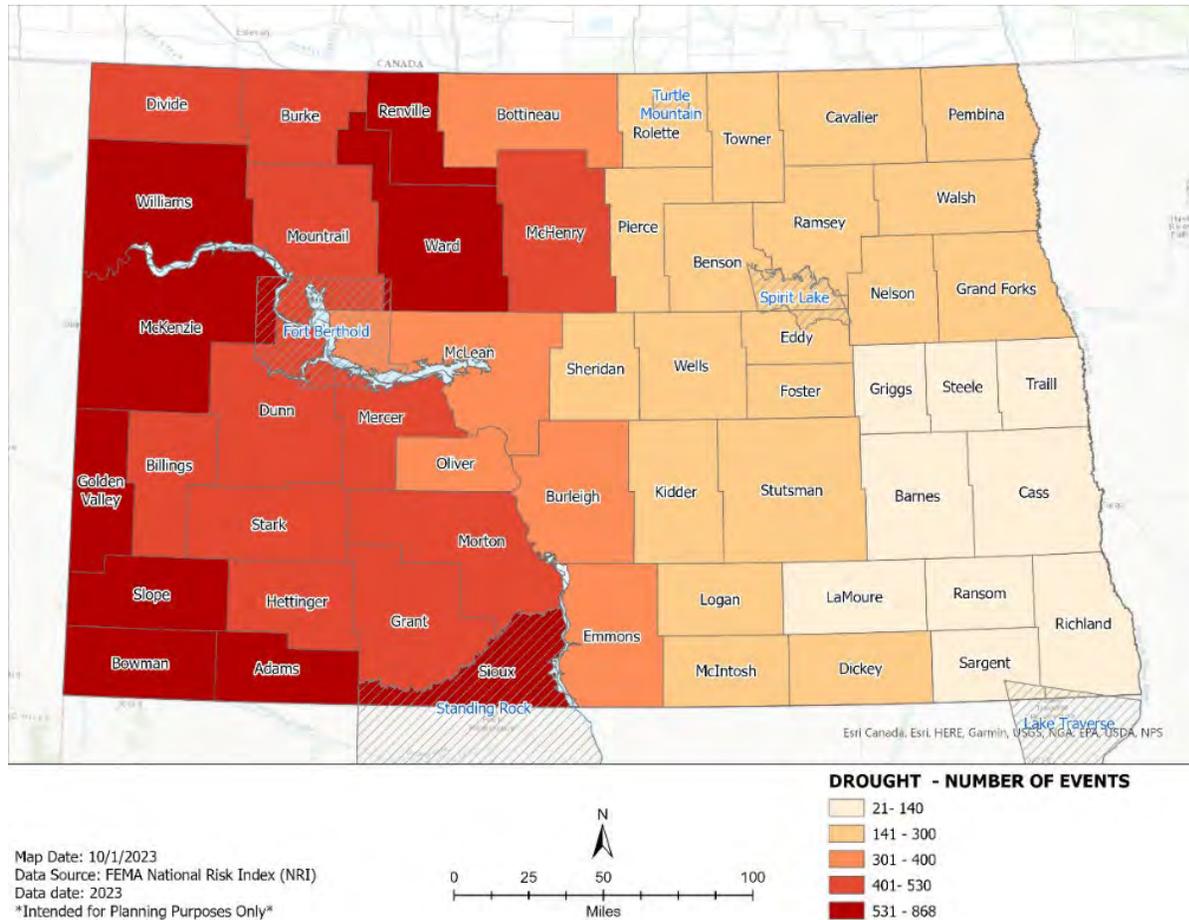
**Future Conditions**

- **Location:** The locations of this hazard will remain the same, with the exception of additional areas as annexed into the city.
- **Extent/Intensity:** See Anticipated Future Climate Impact below.
- **Frequency:** See Anticipated Future Climate Impact below.
- **Duration:** See Anticipated Future Climate Impact below.

<p><b>Anticipated Future Climate Impact – Drought Hazard</b></p> <p>Through the end of this century, expect larger and more intense droughts, with increasing frequency and/or longer duration of drought periods in North Dakota. Potential impacts include more episodes of extreme heat/heat index with increased human, animal, and crop stress; more rapid onset of drought conditions or flash drought; more drought related (both wind and rapid rainfall runoff) erosion, riverbank destabilization, etc.; reductions in overall agricultural economy. Drought impacts on vulnerable water users, such as the agriculture industry and municipal systems, will likely be exacerbated.</p>
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# Previous Occurrences – Drought

The diagram below illustrates the number of drought related events from 2000 through 2022.



Given the lengthy history of frequent, severe, and prolonged drought incidents in the state’s history, North Dakotans have a high probability of experiencing drought hazards in varying degrees. Drought is a hazard that should be routinely prepared for and proactively planned for. Source: ND 2024-202929 Enhanced Mitigation Plan

**1930’s Dust Bowl:** June 1929 was one of the driest on record in North Dakota, followed by continuing drought conditions throughout the 1930s. In 1936, North Dakota recorded its highest temperature of 121°F at Steele, ND on July 6. (State Historical Society of North Dakota, 2007)

The “Dust Bowl”, as it is called, resulted in widespread drought conditions, soil erosion, and grasshopper infestations. This drought was exacerbated by poor farming practices, low market prices, and a depressed economy. Lessons learned during the 1930s drought stimulated the creation of governmental agencies to promote conservation, increased irrigation, and education stressing more flexible and diverse operations using improved management practices. The

Federal Crop Insurance Program was established and institutions liberalized credit. The United States Department of Agriculture (USDA), the North Dakota State Agricultural Experiment Station System, and agricultural colleges and universities began an intensified research effort. This resulted in technologies for control of soil erosion, soil moisture conservation, higher yielding grain varieties that could better withstand dry conditions, improved fertilizers, and better farm management techniques.

**1950s:** The impact of drought in the early 1950s was less severe than the 1930s. The widespread financial distress, interstate migration, and regional disruption characteristic of the Dust Bowl era were largely absent. Strong emphasis was placed on water conservation and augmentation, weather modification research, weather prediction and control, groundwater recharge, irrigation and river basin development, evaporation control, desalination, phreatophyte control, and irrigation canal lining.

**1970s and 1980s:** 1976 was the driest year in North Dakota since the 1930s. (State Historical Society of In the 1970s and 1980s, response to drought by state and federal governments was characterized by provisions for livestock feed assistance, crop loss financial aid packages (deficiency and disaster payments), commodity stock adjustments, disaster credit and forbearance programs for agriculture producers and related small businesses, and some water-related assistance

**1976:** Presidential Emergency Declaration (DR 3016 declared July 21, 1976) for North Dakota including Burleigh County. Driest year in North Dakota since 1936.

**1988:** The North Dakota Governor declared a statewide emergency because of the drought. Damages were not limited to agricultural losses. Public water systems and individual wells also began to dry up. (North Dakota State Water Commission, 1994) Disaster damage in 1988 was estimated to be \$3.5 billion, not including the cost of indirect impacts. .

**2000-2007:** North Dakota soils were under some degree of drought and ruled for 78 consecutive months from December 2000 until mid-June 2007. The most severe drought occurred during

**July 2006** when 100 percent of the state experienced at least moderate drought status on the drought monitor scale.

**2012:** Governor Jack Dalrymple declared an agricultural emergency for the state due to drought conditions on August 14, 2012. The declaration included 49 counties (including Burleigh) and the five reservations. Most locations across western and central North Dakota this year experienced it as one of the top ten warmest years on record, drier than normal conditions, and a snowfall deficit of over 10 inches. Several locations had their warmest March average temperature on record. The average temperatures in March were 12 to 14 degrees Fahrenheit above normal. The drought conditions deteriorated throughout the summer and fall, with below normal precipitation and abnormally dry conditions. In August and September, there were very high and extreme fire dangers in portions of southwest and south central North Dakota. The west to northwest wind gusts were reported between 45 to 51 mph on several days. The drought conditions improved during November and December as the weather pattern transitioned into wetter than normal conditions.

**May, 2017:** Voluntary water restrictions requested in City of Bismarck and City of Lincoln due to low water reservoirs as a result of a period of increased temperatures.

**July, 2017:** Burleigh County issued a drought emergency declaration on July 26, 2017. On July 27, 2017 Gov. Doug Burgum declared a drought disaster for nearly all of North Dakota. The U.S. Drought Monitor's weekly report (July 27) rated nearly 46 percent of North Dakota in extreme (D3) or exceptional (D4) drought. About 16 percent of the state was in severe drought (D2) and 18 percent is in moderate drought (D1). More than 300 wildfires had been reported to the North Dakota Department of Emergency Services since April 1.

**2021:** Governor Burgum issued a statewide drought disaster declaration on April 8, 2021. The drought coverage area surpassed the 2017 record, and a severe deficit of moisture during September 2020 through February 2021 exceeds the driest six-month period on record since 1895.

### **Data Limitations**

The greatest data limitation with drought is the inability to pinpoint the start and end of drought periods and the associated correlation with economic losses.

# Fire (Urban Fire) – Hazard Profile

## Description

Fire by definition is a rapid, self-sustaining oxidization process accompanied by the evolution of heat and light of varying intensities. (Essentials of Fire Fighting 4 addition) In other words, fire is a form of oxidation. On the slow end of oxidation you have rusting which can take months to occur and on the fast end of oxidation you have an explosion that happens in micro-seconds, with fire at a rate of just seconds. If fire occurs in a structure it can increase in size very rapidly and be out of control within seconds.

Urban fire departments are one of the oldest continuing institutions in the United States. Professional firefighters are well trained in the latest skills for preserving life and applying their abilities to limit property damages. Fire departments conduct regular inspections to identify and help reduce the fire risk that businesses may have. In addition, public education programs have been implemented within the community to educate businesses and the citizens on the importance of fire safety awareness in the prevention and reduction of fires.

The overall picture of fire safety information reveals that, per capita, the United States has one of the highest death rates in the industrialized world. Bismarck, North Dakota averages approximately 124 fires per year. Records show that Bismarck has less than one fire-related death per year and less than 2 fire-related injuries per year on average. Cooking related fires account for approximately 20% of all fires within the community.

Although structure fires are usually individual disasters and not community wide ones, the potential exists for widespread urban fires that can displace several businesses or families and exceed local resources. Urban blocks, commercial structures, and apartment buildings are vulnerable, especially the downtown area which consist of older buildings that have been renovated several times. Fires in the downtown area can have a significant economic impact.

While building and fire code enforcement have contributed to improved fire and life safety in new and existing buildings in recent years, fire prevention and awareness of the owners and occupants of buildings is key. Smoke detectors, automatic fire alarm systems, automatic sprinkler systems, fire doors, and fire extinguishers can all aid in preventing and reducing deaths, injuries, and damage from fire.

<b>Fire Causes – City of Bismarck</b>				
<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<i>101 Total Fires</i>	<i>96 Total Fires</i>	<i>126 Total Fires</i>	<i>96 Total Fires</i>	<i>111 Total Fires</i>
Operating equipment 30%	Cooking 29%	Undetermined ignition source 26%	Cooking 28%	Cooking 44%
Cooking 23 %	Operating Equipment 21%	Cooking 21%	Operating Equipment 25%	Operating Equipment 20%
Undetermined ignition source 17%	Undetermined ignition source 20%	Operating Equipment 20%	Undetermined ignition source 15%	Undetermined ignition source 11%
Ember 8%	Open Flame Source 8%	Cigarettes 7%	Open Flame Source 8%	Open Flame Source 7%
Electrical Arcing 7%	Electrical Arcing 7%	Ember 6%	Ember 8%	Ember 7%
Cigarettes 6%	Cigarettes 5%	Electrical Arcing 3%	Electrical Arcing 6%	Chemical Reaction 5%
Open Flame Source 4%	Ember 5%	Chemical Reaction 3%	Cigarettes 6%	
Other Causes 5%	Other Causes 5%	Other Causes 14%	Other Causes 4%	Other Causes 6%

Summary of Changes in Demand for Service: 2015 thru 2019:

# Demand For Service

## Priority Calls

### Change from 2015 to 2019

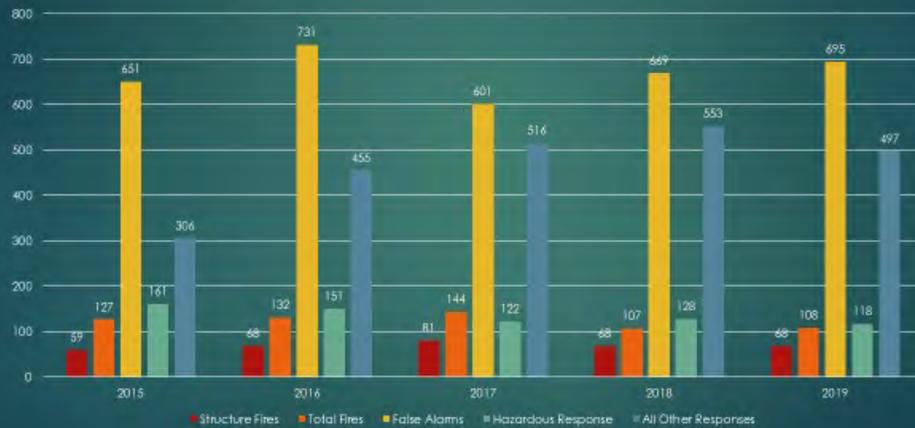
NWB – 50% 50 to 75  
 5E – 138% 39 to 93  
 5D – 58% 24 to 38  
 3C – 51% 204 to 309  
 2G 95% 24 to 47



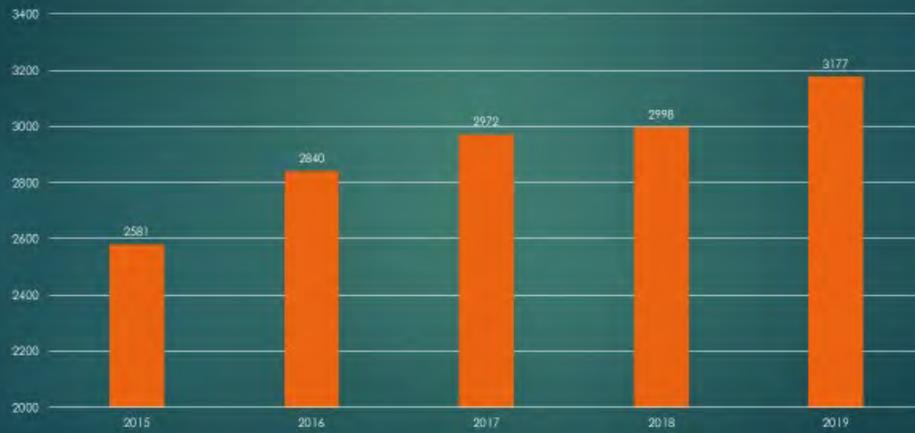
NA – 63% 43 to 70  
 5F – 89% 44 to 83  
 4C – 44% 107 to 155  
 4D – 224 % 25 to 81  
 SE2A – 633% 3 to 22

Overall change from 2015 to 2019 = 26%

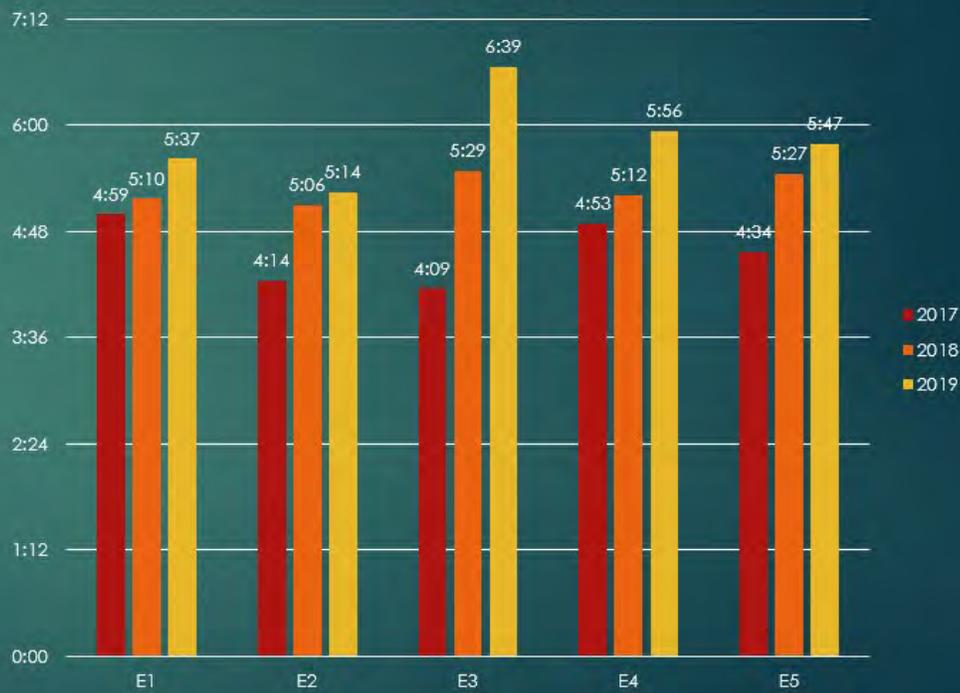
## Fire/Hazardous Response



# Emergency Medical and Rescue Response



## Comparison Average 2nd Engine on Scene 2017 to 2019



# Vulnerability Assessment

Vulnerability: Characteristics of community assets that make them susceptible to damage from a given hazard.

Scenario	Residential Fire	Commercial	Conflagration
<b>Probability</b>	Very Likely	Very Likely	Unlikely
<b>Speed of Onset</b>	No Notice Event	No Notice Event	Possible escalation event
<b>Duration</b>	Minutes to Hours	Hours	Hours to beyond 24 hours
<b>Geographic Area</b>	Localized Event – may impact any area	Localized Event – may impact any area	May spread to city blocks
<b>Death / Injury</b> 1. Primary Causes  A. Highest vulnerability	1. Smoke inhalation or direct flame contact  A. Residents in older apartment bldgs. The elderly and very young.	1. Smoke inhalation or direct flame contact  A. The elderly and very young.	1. Smoke inhalation or direct flame contact if evacuation is not completed in a timely manner  A. The elderly and very young.
<b>Mass Casualty Incident</b>	Low probability	Low to Moderate probability	Low probability Explosion / collapse may cause mass casualty
<b>Property Losses</b> (points of vulnerability – high priority)	1. Room and contents to the entire structure. 2. Mobile homes	1. Room and contents to the entire structure	1. Multiple Structures
<b>Environmental</b>	1. Toxic smoke and other gases released 2. Water run-off	1. Toxic smoke and other gases released possibly hazardous materials depending on the business. 2. Run-off from water used to suppress fire.	1. Toxic smoke and other gases. 2. Water run-off. 3. Possible hazmat releases. 4. Possible gas main issues.

Scenario	Residential Fire	Commercial	Conflagration
<b>COG/COOP</b>			1. FD personnel – first responders.
<b>Critical Facilities</b>		See Section 8 for listing of Critical Facilities.	See Section 8 for listing of Critical Facilities.
<b>Critical Infrastructure</b>		See Section 8 for listing of Critical Infrastructure.	See Section 8 for listing of Critical Infrastructure.
<b>Schools</b>		1. Unsprinklered schools and portable classrooms.	1. Unsprinklered schools and portable classrooms.
<b>High Risk Facilities (chemical)</b>		See Section 8 for listing of Hazmat Sites as of December 31, 2024.	See Section 8 for listing of Hazmat Sites as of December 31, 2024.
<b>Specific Populations:</b> Public Assembly, Vulnerable / Special Populations	1. Nursing homes, Assisted Living, Group Homes, and those living in Mobile Homes	1. Belle Mehus 2. Dakota Stage 3. Churches Bars and Restaurants with occupant loads of less than 300	1. Properties and populations in closer proximity to each other are more vulnerable. 2. Otherwise, all sections of the city are of equal vulnerability.
<b>Economy</b> (community wide)	Minor impact	Moderate impact  Downtown Business District	Catastrophic Impact
<b>OTHER:</b>			FD personnel due to response.

<b>Changes in Vulnerability</b> Since the previous plan update in 2020.	
Increase in Vulnerability	Decrease in Vulnerability
No changes aside from additional property as annexed into the city. See Community Profile Section 7.	See Pest Infestation Hazard Mitigation Capabilities listed in Section 3.

<b>Risk</b>
See Section 10 of this plan document for risk assessment and hazard ranking of all hazards addressed in this plan.

**Relationship to other Hazards:** The Fire hazard is closely associated with Hazardous Materials Release hazard in that fires may involve or create hazardous materials and a release of hazardous materials may result in fire. Also, natural hazards such as lightning (severe summer weather) may cause fires and fires may be intentional as an attack, through Civil Disturbance or as an act of Terrorism. Also see Wildland Fire (wildland urban interface).

### Future Conditions

- **Location:** Additional properties within the current jurisdiction as well as new properties and geographic locations as annexed into the city.
- **Extent/Intensity:** No change.
- **Frequency:** No change. Although additional properties and development create a potential for an increase in frequency, mitigation efforts including public education and code requirements are anticipated to minimize changes in frequency. See Section 3 for mitigation capabilities specific to the Fire Hazard.
- **Duration:** The duration of fire hazards is not projected to change.