



Park County

Multi-Jurisdictional Hazard Mitigation Plan





Executive Summary

The 2025 Multi-Jurisdictional Hazard Mitigation Plan (HMP) for Park County is designed to address and mitigate the long-term risks posed by various hazards specific to the area. This comprehensive plan aims to make Park County and its residents less vulnerable to future hazard events by focusing on the unique needs and circumstances within the jurisdiction.

The update of this HMP reflects Park County's commitment to mitigating risks from hazards and serves as a strategic tool to guide decision-makers in directing mitigation activities and resources effectively. The plan engages stakeholders to include residents, businesses, non-governmental organizations (NGOs), as well as local and state government officials. These stakeholders ensure that the mitigation actions reflect the community's priorities and capabilities.

This HMP has been meticulously crafted to meet the requirements set forth by the Federal Emergency Management Agency (FEMA) and the State of Colorado (the State), ensuring compliance with the Disaster Mitigation Act of 2000 and other relevant guidelines and regulations. By doing so, the plan ensures that Park County remains eligible for specific federal disaster assistance programs, such as the FEMA Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA).

Each year, natural disasters claim the lives of hundreds of people in the United States and injure thousands more. Nationwide, taxpayers spend billions of dollars annually to help communities, organizations, businesses, and individuals recover from these events. These expenditures only partially reflect the true cost of disasters, as additional expenses incurred by insurance companies and NGOs are not covered by tax dollars. Many natural disasters are predictable, and much of the damage they cause can be mitigated or even prevented. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from such hazards.

The HMP outlines specific mitigation strategies and actions tailored to reduce the impact of hazards on Park County, thereby improving resilience and safety for the community. The plan must be adopted by the governing body, Park County Office of Emergency Management and reviewed by the Colorado Division of Homeland Security and Emergency Management (DHSEM) before being submitted to FEMA for final approval. Having a FEMA-approved HMP makes the County eligible for various federal and state grants aimed at hazard mitigation, which can help fund the implementation of the identified actions.

The 2025 HMP for Park County aligns with the characteristics and requirements of a Multi-jurisdictional Hazard Mitigation Action Plan (HMP). It focuses on hazards, engages the community, complies with regulatory standards, and outlines specific mitigation strategies, demonstrating the County's dedication to safeguarding its residents, properties, and resources from potential future disasters, ensuring a safer and more resilient community.



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Chapter One: Introduction

Authority

The federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) required state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Prior to 2000, federal disaster funding focused on disaster relief and recovery, with limited funding for hazard mitigation planning. The DMA increased the emphasis on planning for disasters before they occur. The DMA encourages state and local authorities to work together on pre-disaster planning promoting sustainability for disaster resistance. Sustainable hazard mitigation includes the sound management of natural resources and the recognition that hazards, and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

Purpose

The purpose of this HMP is to reduce or eliminate the long-term risk to human life and property from hazards. The plan aims to identify and assess risks and implement strategies to protect people and property from future hazard events. It addresses a variety of hazards, including natural, technological, and human-caused incidents that could potentially impact Park County, Colorado. In addition to enhancing community resilience, this HMP ensures that Park County is eligible for certain federal disaster assistance programs, including the FEMA Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), and the Flood Mitigation Assistance Program (FMA). By aligning with federal requirements and leveraging available resources, Park County strives to create a safer, more prepared, and resilient community capable of withstanding and recovering from future hazard events.

This HMP identifies resources, information, and strategies for reducing risk from natural hazards. Elements and strategies in the plan were selected because they meet program requirements and best meet the needs of Park County and its citizens. This plan will help guide and coordinate mitigation activities throughout Park County.

The Park County HMP was developed to meet the following objectives:

- Meet or exceed the requirements of the DMA.
- Enable Park County to use federal grant funding to reduce risk through mitigation.
- Meet the needs of Park County as well as state and federal requirements.
- Create a risk assessment that focuses on hazards of concern specific to Park County.
- Create a single planning document that integrates all planning efforts within Park County, supporting partnerships and future updates.
- Meet the planning requirements of FEMA's Community Rating System (CRS), allowing Park County to participate in the CRS program and enhance its CRS classifications.



- Coordinate existing plans and programs so that high-priority initiatives and projects to mitigate possible disaster impacts are funded and implemented.

All citizens, businesses, government agencies and non-profit organizations are the ultimate beneficiaries of this HMP. The plan reduces risk for those who live in, work in, and visit the County. It provides a viable planning framework for all foreseeable natural hazards that may impact Park County. Participation in the development of the plan by key stakeholders in the County helped ensure that outcomes will be mutually beneficial. The resources and background information in the plan are applicable countywide, and the plan's goals and recommendations can lay the groundwork for the development and implementation of mitigation activities and partnerships.

Background and Scope

Each year in the United States, natural disasters claim the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These funds only partially reflect the true cost of disasters, as additional expenses incurred by insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be reduced or even eliminated.

Hazard mitigation is defined by FEMA as “any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event.” The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provide evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$6 in avoided future losses, in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2019 Report).

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This plan documents Park County's hazard mitigation planning process, identifying relevant hazards and vulnerabilities, and outlining strategies that the County will use to decrease vulnerability and increase resiliency and sustainability throughout the community.

This HMP was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6) and finalized on October 31, 2007. Hereafter, these requirements and regulations will be collectively referred to as the Disaster Mitigation Act (DMA) or DMA 2000. While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that hazard mitigation plans must meet for the jurisdictions to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288). This planning effort also follows FEMA's most recent planning guidance.

This plan update includes the integration of other comprehensive planning documents that are in effect within Park County. These are included in the following table.



Park County Hazard Mitigation Plan 2025

Table 1. Integrated Plans

Plan Title	Jurisdiction/Area	Original/Last Update	Summary
Park County Strategic Master Plan	Park County	2001	Long-term framework for growth and development in the county.
Park County Land Use Regulations	Park County	Updated through 2015	Provides zoning, permitting, and land use standards.
Park County Land Use and Building Codes	Park County	Updated through 2015	Includes construction and safety standards for buildings and structures.
Park County Multi-Hazard Emergency Operations Plan	Park County	2015	Outlines emergency response structure for all hazards.
Town of Fairplay Comprehensive Plan	Town of Fairplay	2005	Guides land use, infrastructure, and community development in Fairplay.
Town of Fairplay Land Use and Development Code	Town of Fairplay	2013	Provides regulatory guidance for land development and zoning.
Park County Community Wildfire Protection Plan (CWPP)	Park County (Countywide)	2007	Identifies wildfire risks and mitigation priorities across Park County.
Platte Canyon Community Wildfire Protection Plan (CWPP)	Platte Canyon FPD Area	2007	Targeted wildfire mitigation strategy for the Platte Canyon area.
Lake George Community Wildfire Protection Plan (CWPP)	Lake George FPD Area	2007	Identifies wildfire risks and recommends fuels treatments.
North Fork South Platte Community Wildfire Protection Plan	North Fork South Platte Area	2010	Includes community engagement and hazard reduction in the watershed area.

Park County has adopted actions that promote the integration of the HMP and the comprehensive plans in effect within the planning area. This integration ensures that high-priority initiatives and projects to mitigate possible disaster impacts are funded and implemented, creating a safer and more resilient community.

Park County is subject to various hazards, making access to FEMA grant programs vital. The information in this HMP will guide and coordinate mitigation activities and decisions for future land use policy.



Park County Hazard Mitigation Plan 2025

Proactive mitigation planning will help reduce the cost of disaster response and recovery for communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The HMP aims to create a safer, more resilient Park County by systematically identifying hazards, assessing vulnerabilities, and developing strategies to reduce risks and enhance community preparedness.

This plan is a Multi-Jurisdictional Hazard Mitigation Plan (HMP) that geographically covers the entire area within Park County's jurisdictional boundaries (hereinafter referred to as the planning area). The following jurisdictions known as the planning area, participated in the planning process and are seeking approval of this HMP plan update:

- Park County (unincorporated)
- Town of Alma
- Town of Fairplay
- Lake George Fire Protection District
- North-West Fire Protection District
- Platte Canyon Fire Protection District
- Hartsel Fire Protection District
- Jefferson-Como Fire Protection District
- Southern Park County (Guffey) Fire Protection District

Plan Layout

The 2025 Park County Multi-Jurisdictional Hazard Mitigation Plan (HMP) has been structured and designed to assess risks, identify mitigation strategies, and ensure that Park County and its participating jurisdictions can effectively reduce hazard vulnerabilities and enhance community resilience.

Introduction provides an overview of the plan, outlining its authority, purpose, background, and scope, as well as details regarding the plan layout and adoption process to ensure compliance with FEMA requirements. The Overview of the HMP explains how proactive risk reduction efforts contribute to minimizing disaster impacts on people, property, infrastructure, and the environment.

Planning Process section describes the approach used to develop the plan, highlighting the formation of the Emergency Services (ES) Council, interagency coordination, public engagement, and review of existing hazard planning documents. It also outlines stakeholder involvement, chronological development, and formal plan adoption. Public input played a crucial role, with community members contributing through meetings, surveys, and workshops.

Community Profile section provides a historical overview of Park County, covering its geography, climate, population demographics, economy, land use, and infrastructure. It also assesses future development trends and employment sectors, ensuring that mitigation strategies consider projected growth and economic shifts. Additionally, a review of federally and state-declared disasters in Park County highlights past wildfires, floods, earthquakes, and extreme weather events, which have shaped the county's risk landscape.



Risk Assessment and Methodology section details the process used to evaluate Park County's hazard exposure, vulnerabilities, and potential losses. It includes hazard identification, assessment, and an evaluation of impacts. The plan profiles specific hazards such as severe winter weather, flooding, dam/levee failure, drought, wildfires, air quality, earthquakes, seismic activity, landslides, public health incidents, agricultural hazards, and man-made hazards. The Vulnerability Assessment Process further analyzes critical infrastructure, facilities, and economic assets at risk while estimating potential financial losses through GIS modeling and hazard simulation tools.

Capability Assessment evaluates Park County's ability to implement mitigation actions by examining administrative, technical, and fiscal resources, as well as public education, outreach programs, and interagency partnerships. The Mitigation Strategy section outlines the county's goals and objectives for hazard reduction, identifies potential mitigation actions and projects, and ranks them through a prioritization process. The Mitigation Action Plan provides a roadmap for implementation, ensuring alignment with existing county and state planning mechanisms.

Plan Implementation and Maintenance section establishes procedures for monitoring, updating, and integrating mitigation strategies into other planning efforts, such as zoning laws, building codes, and emergency response plans. This section also details the maintenance schedule, progress tracking, and ongoing public involvement to keep the community engaged in hazard mitigation efforts.

Documentation of Planning Participation ensures that all jurisdictions involved in the planning process are recognized for their contributions, reinforcing a collaborative approach to hazard mitigation.

The 2025 Park County Multi-Jurisdictional Hazard Mitigation Plan serves as a comprehensive framework for reducing hazard risks and enhancing resilience. Through interagency collaboration, community engagement, and data-driven mitigation strategies, the plan provides a proactive approach to disaster preparedness, ensuring the safety and sustainability of the planning area.

Plan Adoption

44 CFR Section 201.6(c)(5) requires documentation that a HMP has been formally adopted by the governing body of the jurisdiction requesting federal approval of the plan. This plan will be submitted for a pre-adoption review to the DHSEM and FEMA prior to adoption. Once pre-adoption approval has been provided, all planning partners will formally adopt the plan. All partners understand that DMA compliance and its benefits cannot be achieved until the plan is adopted. FEMA Region VIII granted final approval of Park County, 2025 HMP and its planning partners in XXXXXXXXXX. Digital Copies of the FEMA approval letter can be found in the appendix.



Overview of Hazard Mitigation Planning

The planning area followed a planning process prescribed by FEMA as detailed in the table below:

Table 2. DMA and CRS Process for Developing the HMP

Step	DMA 2000 Process	CRS Process	Description
1	201.6(c)(1) & 201.6(b)(1)	Organize the Planning Effort (CRS Step 1)	Organize resources, assemble a planning team (Emergency Services (ES) Council), secure funding, and define the scope and objectives of the plan. Ensure alignment with existing community plans and policies.
2	201.6(b)(2) & 201.6(b)(3)	Involve the Public (CRS Step 2)	Conduct public meetings, surveys, and workshops to ensure community input in the planning process. Provide education on hazard risks and mitigation strategies.
3	201.6(b)(1) & 201.6(c)(1)	Coordinate with Other Agencies (CRS Step 3)	Engage various departments and agencies to integrate their expertise and resources, ensuring alignment with land-use planning, floodplain management, and emergency response plans.
4	201.6(c)(2)(i)	Assess Hazard Exposure (CRS Step 4)	Identify natural and human-made hazards affecting the community using historical data, and hazard maps.
5	201.6(c)(2)(ii)	Conduct Risk Assessment (CRS Step 5)	Assess vulnerabilities by analyzing the probability, extent, and impact of each hazard on people, property, infrastructure, and the economy. Use FEMA's Hazus-MH or GIS modeling for detailed risk assessment.
6	201.6(c)(3)(i) & 201.6(c)(3)(ii)	Set Goals and Develop the Mitigation Strategy (CRS Step 6)	Define risk reduction goals and objectives. Develop and prioritize mitigation actions to reduce risks, considering cost-benefit analysis and feasibility.
7	201.6(c)(3)(ii) & 201.6(c)(3)(iii)	Review Possible Mitigation Actions (CRS Step 7)	Evaluate various mitigation activities, including infrastructure improvements, land-use policies, and emergency preparedness strategies. Incorporate nature-based solutions where applicable.



Park County Hazard Mitigation Plan 2025

Step	DMA 2000 Process	CRS Process	Description
8	201.6(c)(3)(iii)	Draft an Action Plan (CRS Step 8)	Create a detailed implementation plan that outlines specific mitigation actions, responsible agencies, timelines, and potential funding sources. Integrate the plan with floodplain management and land-use policies.
9	201.6(c)(5) & 201.6(c)(4)	Adopt the Plan and Implement Actions (CRS Step 9)	Formally adopt the mitigation plan through local government approval. Ensure integration with other local, regional, and state planning mechanisms. Implement prioritized actions and seek funding sources.
10	201.6(c)(4) & 201.6(d)(3)	Monitor, Evaluate, and Update the Plan (CRS Step 10)	Establish a monitoring framework to track progress, update the plan every five years (per FEMA), and conduct annual CRS recertifications. Adjust mitigation actions based on new data, community feedback, and lessons learned from recent disasters.

The Planning Process

To develop the Park County HMP, the planning area followed a process that had the following primary objectives:

- Secure grant funding for the hazard mitigation planning process, ensuring financial resources for plan development and implementation.
- Issue a Request for Proposal (RFP) to hire a qualified consultant to assist in updating the Park County HMP in compliance with FEMA's 2022 Local Mitigation Planning Guide.
- Select a vendor (Chloeta) that meets all RFP requirements at the lowest cost to facilitate plan coordination, stakeholder engagement, and technical updates.
- Establish the Core Planning Team by utilizing the Park County Disaster Council as the lead planning group.
- Form a planning partnership by identifying and engaging local, state, tribal, and federal stakeholders, including emergency management, public works, utilities, businesses, and community organizations.
- Define the planning area to ensure all relevant jurisdictions and unincorporated areas are included in the mitigation strategy.
- Conduct multi-agency coordination by engaging local government departments, regional planning bodies, neighboring counties, and tribal nations to integrate hazard mitigation efforts.
- Review and integrate existing programs, plans, and studies, such as land use plans, floodplain management plans, wildfire protection plans, capital improvement programs, and emergency response strategies.



Park County Hazard Mitigation Plan 2025

- Conduct a comprehensive risk assessment by identifying hazards, assessing vulnerabilities, and evaluating potential losses using FEMA's Hazus-MH modeling and GIS tools.
- Ensure compliance with FEMA's Whole Community Approach by incorporating equity considerations, vulnerable population assessments and resilience strategies into mitigation planning.
- Develop a public engagement strategy that includes community surveys, stakeholder meetings, social media outreach, dedicated websites, and public workshops to gather input and educate residents on hazard risks and mitigation efforts.
- Document all planning activities and stakeholder participation to ensure transparency and meet FEMA's plan adoption and documentation requirements.

These objectives are discussed in the following sections.

Planning Overview

The planning process for the Park County HMP involved coordination with various government departments, non-governmental agencies, neighboring jurisdictions, Park County officials, the Colorado Division of Homeland Security and Emergency Management (DHSEM) and FEMA. Public involvement was actively solicited through public meetings, surveys, and community workshops, with the feedback collected playing an integral role in shaping the plan.

The process began with an initial planning meeting aimed at introducing the HMP process and identifying key stakeholders. This was followed by a hazard identification workshop in which community members and stakeholders participated, helping identify hazards and assess their potential impacts. The development of the mitigation strategy involved collaborative sessions where stakeholders worked together to establish goals, objectives, and actions to enhance the county's resilience to hazards.

Throughout the planning process, public participation was highly encouraged through community meetings, surveys, and public comment periods. Information was disseminated via the County's website, local newspapers, and social media platforms to ensure outreach to a broad audience. Special efforts were made to include vulnerable populations in the planning process to ensure their concerns and needs were addressed.

The Emergency Services (ES) Council included representatives from various sectors of Park County, including government officials, emergency services, public health, education, businesses, and community organizations. These individuals collaborated closely to ensure the plan was comprehensive and addressed the needs of the entire county.



Formation Of Planning Team

The development of the 2025 Park County Multi-Jurisdictional HMP was led by the Park County Office of Emergency Management in coordination with FEMA Region VIII and the Colorado Division of Homeland Security and Emergency Management (DHSEM). The Emergency Services (ES) Council was formed to ensure a multi-jurisdictional, collaborative approach that integrates local expertise, operational knowledge, and community priorities.

The ES Council was supported by a contracted technical consultant to facilitate data analysis, risk assessment, and plan documentation. Public engagement was prioritized through surveys, virtual meetings, and stakeholder workshops. This inclusive approach ensured that the 2025 HMP reflects the needs, capacities, and mitigation priorities of all jurisdictions within Park County.

Planning Partnership

The 2025 Park County Multi-Jurisdictional HMP was developed through a collaborative partnership between various organizations and stakeholders, forming the foundation of the Planning Partnership. This partnership included Park County, the Town of Fairplay, Lake George Fire Protection District, North-West Fire Protection District, Platte Canyon Fire Protection District, and South Park Ambulance District.

These diverse stakeholders, working in tandem with the Park County Office of Emergency Management and other county departments such as Planning and Zoning, Public Health, and Public Works formed a cohesive and integrated Emergency Services (ES) Council. This team guided the development of the HMP to ensure it addressed the full spectrum of potential hazards and community needs across all jurisdictions in Park County.

Table 3. HMP Planning Committee Members

Organization	Name	Contact Information
Park County Sheriff's Department	Tom McGraw, Sheriff	Tom.mcgraw@parkcountyco.gov
Town of Alma	Bob Kassel, Mayor	bob.kassel@townofalma.com
Town of Fairplay	Frank Just, Mayor	admin@fairplayco.us
Unincorporated Park County	Tim Ellis, Deputy Emergency Manager	tim.ellis@parkcountyco.gov
Jefferson-Como Fire Protection District (FPD)	Trent Smith, Fire Chief	chief@jcfpd.org
Platte Canyon FPD	Ben Mulligan, Fire Chief	Ben.mulligan@plattecanyonfire.com



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Organization	Name	Contact Information
North-West FPD	Kristy Olme, Fire Chief	chief@nwfpd.org
Hartsel FPD	Brian Cook, Fire Chief	chief@hartsselfire.org
Southern Park County FPD (Guffey FD)	Aric Stahley, Fire Chief	Chief@Guffeyfire.net
Lake George Fire Protection District	Susan Bernstetter, Fire Chief	Susan@lakegeorgefire.com
Park County Communications-911 Dispatch	Maria Mitchell, Director	Maria.mitchell@parkcountyco.gov
Park County Office of Emergency Management	Tim Ellis, Deputy	Tim.ellis@parkcountyco.gov
Park County GIS/Mapping	Samuel Hasselbusch, GIS Administrator	Samuel.hasselbusch@parkcountyco.gov
Park County Public Relations/PIO	Jo Keats	Joannah.keats@parkcountyco.gov

Coordination Among Agencies

Title 44 of the Code of Federal Regulations (44 CFR) requires that opportunities for involvement in the planning process be provided to neighboring communities, the public and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other private and nonprofit interests (Section 201.6.b.2). Involvement by various agencies and stakeholders is identified in the table below, which includes hazard input information, invitation to serve on the Emergency Services (ES) Council, review of data, information and the draft and pre-adopted plan. Those identified were provided an opportunity to provide input, review and/or comment on this plan throughout the effort as they elected to do so, with information provided via multiple websites, at various public outreach efforts, or via email. It should be noted that this is an overview and is not all-encompassing.

Involvement by various agencies and stakeholders is identified in the table below; it includes hazard input information, invitation to serve on the ES Council review of data, information, and the draft and pre-adopted plan. Those identified were provided an opportunity to provide input, review and/or comment on this plan throughout the effort as they elected to do so. The information provided via Park County.



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Table 4. Stakeholder Engagement

Agency or Organization	POC	Kick Off Mtg	Completed Risk Ranking	Completed Annex Templates	Draft Plan Review	Final Plan Review
Sheriff's Department	Tom McGraw, Sheriff	X				
Jefferson-Como Fire Protection District (FPD)	Trent Smith, Fire Chief	X	X		X	
Platte Canyon FPD	Ben Mulligan, Fire Chief	X	X		X	
North-West FPD	Kristy Olme, Fire Chief		X		X	
Hartsel FPD	Brian Cook, Fire Chief		X		X	
South Park County FPD (Guffey FD)	Aric Stahley, Fire Chief		X		X	
Lake George FPD	Susan Bernstetter, Fire Chief	X	X		X	
Communications-911 Dispatch	Maria Mitchell, Director					
Office of Emergency Management	Tim Ellis, Deputy	X	X	X	X	
GIS/Mapping	Samuel Hasselbusch, GIS Administrator	X				
Public Relations/PIO	Emmy Glancy-West Jo Keats				X	
State CO Mitigation	Jason Humble	X			X	
State CO Mitigation	Matt West	X			X	
Director of OEM	Brad Golden	X			X	
	Dakota Kell	X				



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Agency or Organization	POC	Kick Off Mtg	Completed Risk Ranking	Completed Annex Templates	Draft Plan Review	Final Plan Review
Budget & Finance Director	April Chabot	X				
Mayor of Fairplay	Frank Just	X	X			
Mayor of Alma						
Chloeta	Bobbie Jackson	X	X	X	X	

Review of Existing Programs, Plans and Studies

As part of the hazard mitigation planning process, the Emergency Services (ES) Council conducted a comprehensive review of existing programs, plans, ordinances, and studies currently in place throughout Park County and its participating jurisdictions. These documents provide critical context for understanding how hazard mitigation is already being addressed across various sectors, and they serve as a foundation for integrating mitigation strategies into broader community planning efforts. By identifying opportunities for coordination and alignment, the team ensures that the HMP complements and supports ongoing initiatives in land use planning, emergency management, environmental protection, infrastructure development, and public safety. The following table summarizes the key local and state-level documents reviewed during the planning process and their relevance to hazard mitigation goals.

Table 5. Review of Existing Plans, and Studies – Park County

Plan or Study	Responsible Agency / Jurisdiction	Application to Hazard Mitigation
Park County Emergency Operations Plan (EOP)	Park County Office of Emergency Management	Outlines all-hazards emergency response procedures; integrates mitigation, preparedness, response, and recovery.
Community Wildfire Protection Plan (2015)	Park County Fire Districts; Colorado State Forest Service	Identifies wildfire risks, prioritizes fuel treatments, and guides community wildfire risk reduction efforts.
Debris Management Plan	Park County OEM; Public Works	Supports wildfire and flood recovery by organizing safe debris removal; facilitates FEMA reimbursement.
Strategic Master Plan (2016)	Park County BOCC; Planning Department	Directs growth and land use with resilience considerations; supports long-term wildfire and water infrastructure goals.



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Plan or Study	Responsible Agency / Jurisdiction	Application to Hazard Mitigation
Fleet Maintenance and Replacement Plan (2018)	Park County Road & Bridge; Emergency Management	Ensures readiness of response vehicles for emergencies; supports continuity during hazard events.
Road Maintenance and Improvement Plan (2018)	Park County Road & Bridge	Enhances accessibility; can be expanded to prioritize road improvements in high hazard areas.
Town of Fairplay Comprehensive Plan	Town of Fairplay	Guides safe development practices in town; includes hazard exposure and mitigation policies.
Floodplain Ordinances & NFIP Participation	Park County & Town of Fairplay	Regulates development in flood-prone areas; ensures FEMA compliance and access to insurance and funding.
Burn Restrictions & Firewise Programs	Park County Fire Districts; Community Associations	Promotes defensible space and wildfire mitigation at the community level.
School Emergency and Safety Plans	Park County RE-2 School District; Local Charter Schools	Ensures hazard-specific preparedness, including evacuation and lockdown protocols.
Capital Improvement and Economic Plans	Park County Finance Dept.; Municipal Governments	Can prioritize infrastructure upgrades that also reduce vulnerability to hazards.
Local Zoning Ordinances	Park County Planning Dept.; Town of Fairplay	Directs development away from hazard-prone areas and supports long-term resilience.
Drainage / Stormwater Ordinances	Park County Public Works; Town of Fairplay	Manages runoff, controls erosion, and reduces flood risk through infrastructure and regulation.
Colorado State Hazard Mitigation Plan	CO DHSEM	Provides state-level data, guidance, and support for alignment of local mitigation efforts.
LEPC / Tier II Reporting	Park County LEPC (under SARA Title III)	Enhances preparedness and response for hazardous material releases.
Colorado Drought Mitigation & Response Plan	Colorado Water Conservation Board (CWCB)	Guides drought planning and adaptation, with mitigation strategies for water scarcity.
Transportation Master Plans	CDOT; Park County Road & Bridge	Prioritizes upgrades to road networks critical for evacuation, access, and hazard response.



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Table 6. Review of Existing Programs – Park County

Program	Administering Agency	Relation to Hazard Mitigation
National Flood Insurance Program (NFIP)	FEMA; Park County & Town of Fairplay	Regulates floodplain development and provides insurance access. Supports long-term flood risk reduction and compliance.
Firewise USA® Program	National Fire Protection Association (NFPA); CSFS	Encourages communities to take wildfire mitigation actions like defensible space and home hardening.
Community Rating System (CRS)	FEMA (optional under NFIP)	Rewards communities for flood mitigation activities with insurance premium discounts; not currently active in Park County.
Colorado Wildfire Risk Assessment Portal (CO-WRAP)	Colorado State Forest Service	Provides data to assess wildfire risk at parcel and county levels; used for planning and prioritizing treatments.
Pre-Disaster Mitigation (PDM) / Building Resilient Infrastructure and Communities (BRIC)	FEMA / DHSEM	Grant funding to reduce hazard risks before disasters occur. Park County may apply for mitigation project support.
Hazard Mitigation Grant Program (HMGP)	FEMA / DHSEM	Provides post-disaster mitigation funding for projects that reduce future risk (e.g., infrastructure upgrades, defensible space).
State and Local Drought Plans	Colorado Water Conservation Board (CWCB); Park County	Guides response and adaptation to drought. Supports agricultural resilience and water supply planning.
Emergency Management Performance Grant (EMPG)	FEMA / DHSEM	Supports emergency management program development, including planning and mitigation capacity.
State Hazard Mitigation Plan (SHMP)	CO DHSEM	Establishes Colorado's hazard mitigation priorities and supports alignment of local plans, like Park County's HMP.
Ready, Set, Go! Program	International Association of Fire Chiefs (IAFC); Local Fire Agencies	Educates residents on wildfire preparedness and evacuation; complements Firewise efforts.



Related Hazard Planning Documents

Effective hazard mitigation planning requires coordination with existing local, regional, and state-level plans to ensure consistency, reduce redundancy, and strengthen overall resilience. Park County and its participating jurisdictions maintain a variety of planning documents that inform land use decisions, infrastructure investments, emergency response, and environmental management. Integrating hazard mitigation principles into these documents helps institutionalize risk reduction strategies across multiple sectors.

The following table lists key planning documents relevant to hazard mitigation in Park County. These resources support the implementation of mitigation actions and provide important context for assessing community vulnerabilities, prioritizing investments, and guiding future development in a risk-informed manner.

Table 7. Related Hazard Planning Documents – Park County

Plan or Study	Application to Hazard Mitigation
Watershed Management Plans	Identify vulnerabilities related to water quality and quantity; guide post-wildfire erosion control and watershed protection.
Open Space & Trails Plans	Support conservation of floodplains, steep slopes, and wildfire buffers; reduce exposure through preserved undeveloped land.
Public Health Emergency Preparedness Plan	Guides coordinated public health response to pandemics, hazardous materials, and biological events; aligns with mitigation goals.
Emergency Communications Plan	Enhances early warning and risk communication systems; critical for evacuation and hazard awareness.
Parks and Recreation Master Plan	Guides investment in community assets that may serve as shelters, cooling centers, or defensible spaces during hazard events.
Building Code & Fire Code Updates	Adoption of updated codes can improve structural resilience to wildfire, snow loads, wind, and other hazards.
Energy Assurance Plans	Help protect critical infrastructure and ensure energy system reliability during hazard disruptions.

Public Engagement

The public outreach and engagement process for the Park County HMP included various strategies to ensure broad community input and participation. A comprehensive outreach strategy was developed to guide how public feedback would be gathered and how stakeholders would be engaged throughout the planning process. This strategy ensured that communication efforts were tailored to reach all relevant groups in the county.

- Questionnaire: A structured questionnaire was distributed to residents and stakeholders to gather specific information on community perceptions of hazards,



vulnerabilities, and preparedness. The questionnaire served as a key tool to collect insights from a broad segment of the population.

- **Survey Results:** The survey results, compiled from the questionnaire responses, provided critical data to identify priority areas for hazard mitigation. These results informed the Emergency Services (ES) Council about public concerns and areas where community resilience needed improvement.
- **Internet:** Park County Website / Park Sheriff Website: Park County and Park Sheriff websites hosted relevant HMP documents, updates, and public notices. These websites acted as the primary digital platforms for residents to access information about the planning process and participate in online surveys or provide feedback.
- **Social Media:** Social media platforms were utilized to promote awareness of the HMP process, encourage public participation, and share important updates. This outreach tool was particularly useful for reaching a wider audience, including younger demographics.
- **Stakeholder Meetings:** Regular stakeholder meetings were held to gather input from key community members, including government agencies, local businesses, NGOs, and emergency services. These meetings allowed stakeholders to provide direct feedback and collaborate on the development of mitigation strategies.
- **Press Releases:** Press releases were issued to local media outlets to inform the public about key milestones in the HMP process. They served to increase visibility of the plan, highlight the importance of public participation, and announce community engagement events.

The development of the Park County HMP followed a structured and inclusive process that involved comprehensive public engagement, interagency collaboration, and thorough data analysis. From the initial strategy planning to the final approval, each step played a crucial role in shaping the HMP to reflect the unique needs and vulnerabilities of the community. By incorporating stakeholder feedback and utilizing multiple communication platforms, the ES Council ensured broad participation across various sectors. The following chronological development table outlines the key phases of the HMP process, detailing the major milestones, public outreach efforts, and stakeholder involvement that occurred from the plan's inception to its completion.

Chronological Development

The development of the Park County HMP followed a structured and inclusive process that involved comprehensive public engagement, interagency collaboration, and thorough data analysis. From the initial strategy planning to the final approval, each step played a crucial role in shaping the HMP to reflect the unique needs and vulnerabilities of the community. By incorporating stakeholder feedback and utilizing multiple communication platforms, the Emergency Services (ES) Council ensured broad participation across various sectors. The following chronological development table outlines the key phases of the HMP process, detailing the major milestones, public outreach efforts, and stakeholder involvement that occurred from the plan's inception to its completion.



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Table 8. Chronological Development

Date	Event	Description of Activities	Attendance
14 April 2025	HMP Kick-Off Meeting	Initiated the HMP update process; reviewed project scope, schedule, and FEMA/State requirements. Identified HMP Planning Committee members, confirmed stakeholder outreach strategy, discussed goals and objectives framework, and outlined data collection and integration methods.	Park County Planning Committee and Chloeta
5 May 2025	Planning Meeting	Reviewed existing plans, policies, and 2020 mitigation actions; confirmed data sources for hazards and critical facilities; refined the hazard list to reflect current risks and development conditions.	Park County Planning Committee and Chloeta
19 May 2025	Planning Meeting	Conducted hazard identification and risk assessment scoping; reviewed available datasets (HAZUS, NCEI, NFIP, wildfire, drought, flood, etc.); assigned data collection and mapping tasks.	Park County Planning Committee and Chloeta
3 June 2025	Planning Meeting	Reviewed preliminary hazard data and exposure mapping; discussed community assets, critical infrastructure, and applied hazard ranking methodology to prioritize risks.	Park County Planning Committee and Chloeta
16 June 2025	Stakeholder Meeting / Disaster Council	Broadened engagement with local stakeholders, emergency services, utilities, and public agencies. Validated hazard priorities, identified vulnerabilities, and collected input on mitigation progress and needs.	Park County Planning Committee and Chloeta
17 July 2025	Planning Meeting	Developed and refined mitigation goals and objectives consistent with FEMA and State strategies. Aligned plan goals with the County's Comprehensive Plan and land use management policies.	Park County Planning Committee and Chloeta
28 July 2025	Planning Meeting	Reviewed draft risk assessment and hazard ranking results; developed and prioritized mitigation actions; assigned lead agencies and potential funding sources.	Park County Planning Committee



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Date	Event	Description of Activities	Attendance
			and Chloeta
14 August 2025	Planning Meeting	Continued mitigation strategy development; refined project descriptions, timelines, and evaluation criteria; confirmed implementation partners and monitoring procedures.	Park County Planning Committee and Chloeta
25 August 2025	Planning Meeting	Reviewed the 60% Draft Plan including updated hazard profiles, community profile, and mitigation strategy sections; integrated committee feedback and edits.	Park County Planning Committee and Chloeta
30 September 2025	Hazard Mitigation Workshop	Conducted public workshop to present draft hazard profiles, risk assessment results, and proposed mitigation actions. Gathered public comments and community feedback for incorporation into the final draft.	Park County Planning Committee and Chloeta
20 October 2025	Planning Meeting	Reviewed the 95% Draft Plan; discussed revisions for final submission; verified compliance with FEMA Local Mitigation Planning requirements and confirmed adoption timeline.	Park County Planning Committee and Chloeta
3 November 2025	Planning Meeting	Conducted final review prior to submittal to the Colorado DHSEM and FEMA. Confirmed incorporation of public feedback, finalized adoption documentation, and approved the plan for submission.	Park County Planning Committee and Chloeta
5 November 2025	Stakeholder and Public Review	Posted the final HMP draft for stakeholder and public review and comments.	--
20 November 2025	Planning Meeting		Park County Planning Committee and Chloeta



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Date	Event	Description of Activities	Attendance
December 2025	State Review		--
January 2025	FEMA Review		--

Community Profile

This section of the County's HMP provides a comprehensive overview of the county's geographic, demographic, economic, and environmental characteristics. This section outlines key information such as the county's location, climate, population trends, and land use patterns, offering context for understanding its unique vulnerabilities to hazards. It also includes details on critical infrastructure, community lifelines, and key industries that are essential to the county's functionality and resilience. By establishing a baseline understanding of Essex County's physical and social landscape, the profile section serves as a foundation for identifying risks, assessing vulnerabilities, and developing targeted mitigation strategies.

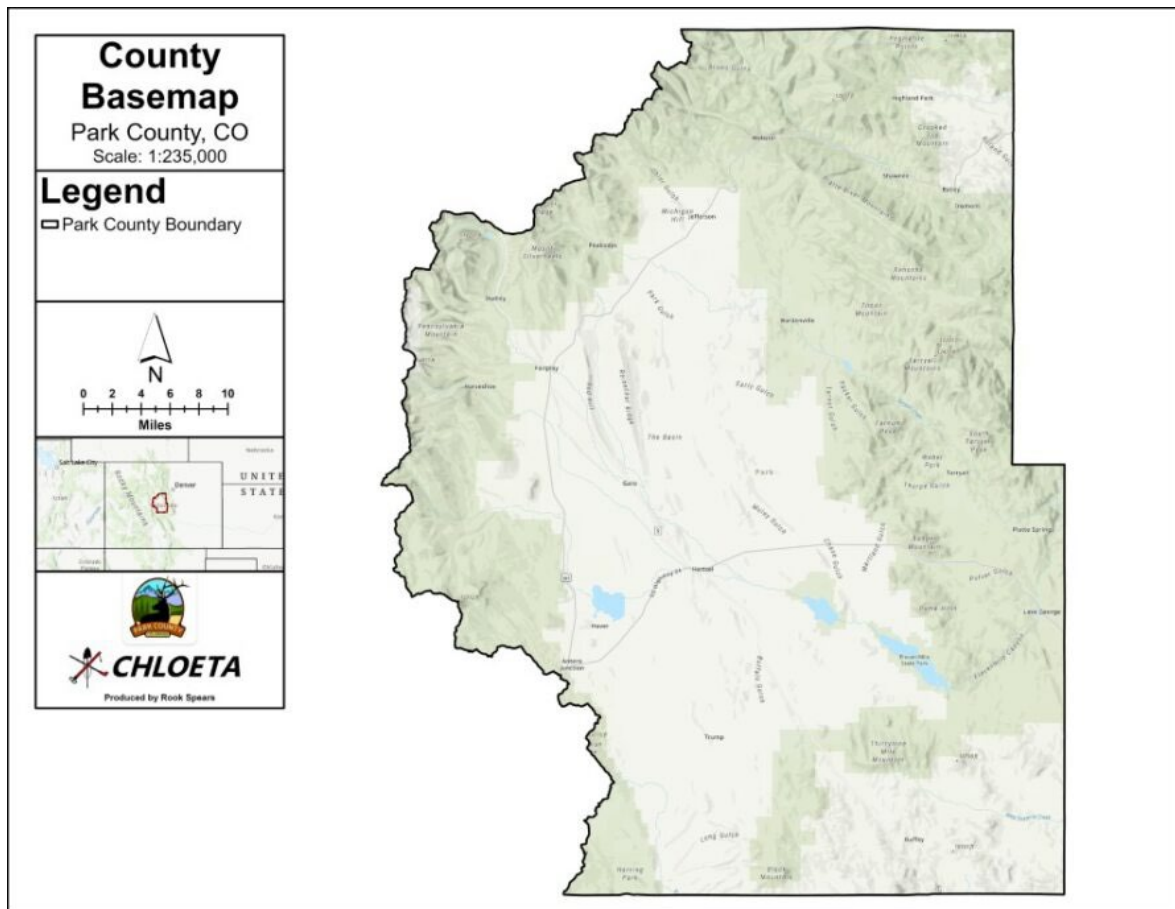


Figure 1. Park County Basemap



History

Park County, Colorado was established on November 1, 1861, as one of the original 17 counties created by the Colorado Territorial Legislature. Located in the geographic center of the state, Park County spans approximately 2,194 square miles of mountainous terrain and high-elevation valleys. It is bordered by Jefferson, Teller, Fremont, Chaffee, Lake, and Summit counties, with the majestic Mosquito and Front Ranges forming natural boundaries. According to the 2020 U.S. Census, Park County had a population of approximately 17,390, making it a sparsely populated yet scenically rich region.

The name “Park” refers to South Park, a high alpine grassland basin once used by Native American tribes, including the Ute people, as a seasonal hunting ground. The area saw an influx of European American settlers during the mid-1800s due to gold discoveries in the region. Mining booms in the towns of Fairplay, Alma, and Guffey fueled early growth, with Fairplay—founded in 1859—becoming the county seat and a hub for commerce and governance.

Today, Park County includes one incorporated municipality, the Town of Fairplay, and several unincorporated communities, including Bailey, Como, Guffey, Hartsel, and Lake George. The county is governed by a three-member Board of County Commissioners, with services provided by county departments and special districts. The economy has transitioned from mining to a mix of tourism, outdoor recreation, ranching, and small business activity, leveraging the area’s natural beauty and access to public lands.

Park County’s rich cultural history, scenic environment, and recreational resources make it a unique blend of frontier heritage and modern resilience. As the county continues to grow, it strives to preserve its rural character while adapting to emerging challenges related to development and disaster preparedness.

Natural and Cultural Resources

Park County is characterized by its expansive natural landscapes and historic cultural features that shape the region’s identity, resilience, and economic vitality. The county encompasses vast portions of the Pike National Forest, high-alpine basins like South Park, and access to significant water bodies including the South Platte River, Eleven Mile Reservoir, and Tarryall Creek. These ecosystems support biodiversity, recreation, agriculture, and natural hazard mitigation by providing buffers against flooding, wildfire, and erosion. Wetlands, meadows, and forested slopes also contribute to water filtration and wildlife corridors.

Culturally, Park County preserves its rich frontier and mining-era heritage through landmarks such as the South Park City Museum in Fairplay, historic mining structures in Alma and Como, and Native American archaeological sites scattered across the region. The county’s inclusion in the federally designated South Park National Heritage Area underscores its historical significance and draws visitors year-round.

Together, these natural and cultural resources are essential to the County’s tourism economy, ecological health, and community identity. Preserving them through hazard mitigation planning helps ensure long-term sustainability, protects irreplaceable heritage assets, and enhances the county’s capacity to withstand and recover from disasters.



Park County Hazard Mitigation Plan 2025

Table 9. Natural Resources Inventory

Resource Name	Type	Location	Function / Benefit
Pike National Forest	National Forest	Throughout central and eastern Park County	Wildfire buffer, wildlife habitat, recreation, erosion control
South Park Basin	Alpine Grassland / Valley	Central Park County (high basin)	Natural floodplain, grazing, habitat corridor, scenic and ecological value
Eleven Mile Reservoir	Reservoir / Lake	Southeast Park County	Flood control, recreation, water supply, fishing and boating
South Platte River	River	Originates in Park County, flows northeast	Water supply, floodplain function, recreation, aquatic habitat
Tarryall Creek	Stream / Tributary	North-central Park County	Riparian habitat, groundwater recharge, flood mitigation
Forested Upland Areas	Forest	County-wide (especially west and south)	Wildfire fuel buffer, slope stability, carbon sequestration
Wetlands and Riparian Zones	Wetland Ecosystems	Scattered throughout county	Biodiversity, water purification, floodwater storage
South Park National Heritage Area	Cultural/Natural Area	County-wide, centered in Fairplay	Historic preservation, tourism, education, cultural resource protection
Historic Rail and Mining Sites (e.g., Como Roundhouse)	Historic Landmark	Como and surrounding areas	Cultural identity, tourism, economic development, historical significance

Table 10. Cultural Resources Inventory

Resource Name	Type	Location	Historical / Cultural Significance
South Park City Museum	Open-Air Museum	Town of Fairplay	Preserves 19th-century mining town structures and artifacts listed on the National Register.
Como Roundhouse, Railroad Depot & Hotel	Historic Railroad Site	Town of Como	Key component of Colorado's early narrow-gauge railroad system; vital to state's rail history.



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Resource Name	Type	Location	Historical / Cultural Significance
Tarryall School	Historic Schoolhouse	Tarryall (rural Park Co.)	One of Colorado's earliest rural school buildings; a symbol of pioneer education.
Fairplay Courthouse Square	Government / Historic Core	Town of Fairplay	Historic seat of county government; focal point for civic life and historical architecture.
Alma Town Hall and Mining Artifacts	Historic Building / Display	Town of Alma	Reflects community heritage as Colorado's highest incorporated town and mining roots.
South Park National Heritage Area	Cultural/Natural Region	Central Park County	Recognized by Congress for its nationally significant cultural, scenic, and historical values.
Buckskin Joe Cemetery	Historic Cemetery	Near Alma	Final resting place of early settlers and miners; important local genealogy and history site.

Geography

Park County is located in central Colorado and spans approximately 2,194 square miles, making it one of the largest counties in the state by area. The county lies entirely within the Southern Rocky Mountains and is defined by its striking topography, including high-elevation valleys, expansive meadows, and rugged mountain ranges. The Mosquito Range forms the western boundary, with peaks exceeding 14,000 feet, while the Front Range defines the eastern edge. The county's geographic centerpiece is the South Park Basin, a high-altitude grassland valley averaging over 9,000 feet in elevation, which supports unique ecosystems and agricultural activity. Numerous rivers and creeks, including the South Platte River and Tarryall Creek, originate in the county, contributing to regional water supply and natural floodplain functions. Park County's diverse terrain influences weather patterns, transportation access, and hazard exposure, particularly in relation to wildfire, flooding, and severe winter conditions. The majority of the land is publicly owned, with large portions managed by the U.S. Forest Service and Bureau of Land Management, offering significant recreational and ecological value.

Insert Map

Figure 2. Park County Geography

Climate

Park County's climate is classified as high-altitude alpine and semi-arid, characterized by cold winters, mild summers, and low annual precipitation. Due to its elevation—ranging from approximately 7,000 to over 14,000 feet—weather conditions vary significantly across the county. Winters are long and can be harsh, with heavy snowfall common in the mountainous areas and high valleys, contributing to seasonal snowpack that supports regional water systems.



Average annual snowfall in higher elevations can exceed 150 inches, while lower areas like Fairplay receive 60–100 inches annually. Summers are typically cool and dry, with average high temperatures ranging from the mid-60s to low 80s °F.

Thunderstorms are frequent in late summer, often accompanied by lightning, hail, and localized flash flooding. The county is also vulnerable to prolonged droughts and high wind events, especially in exposed areas of the South Park Basin.

Climate change has the potential to alter seasonal precipitation patterns, reduce snowpack, and increase the frequency and intensity of wildfires and extreme weather events. These changes may further stress local ecosystems, infrastructure, and water resources, underscoring the importance of adaptive mitigation strategies in Park County.

Population and Demographics

As of the 2020 U.S. Census, Park County had a population of 17,390, reflecting modest growth over the past decade. The county's population density remains low, about 8 people per square mile, with most residents concentrated in unincorporated communities such as Bailey, Fairplay, and Alma. The population tends to skew older, with a median age of 49.4, significantly above the national average, indicating a growing population of retirees and long-term homeowners.

Approximately 94% of the population identifies as White, with smaller percentages of Hispanic or Latino (5.7%), Native American, and other racial or ethnic groups. Roughly 6% of residents report a disability, and 3% speak a language other than English at home, which is relevant for inclusive emergency communications. Seasonal population increases are also significant due to part-time residents, recreation, and tourism activity.

These demographic patterns have direct implications for hazard mitigation and emergency planning. An aging population may have greater mobility and medical access needs during disasters, while rural isolation poses challenges for warning systems and evacuation logistics. Understanding population distribution, vulnerabilities, and access limitations helps ensure that hazard mitigation actions are equitably planned and effectively implemented.

Table 11. Demographic Profile

Demographic Indicator	Value
Total Population	~17,390
Land Area (sq. miles)	2,194
Population Density	~8 people per sq. mile
Median Age	~49.4 years
Population Under 18	~16%
Population 65 and Over	~26%
White (Non-Hispanic)	~94%
Hispanic or Latino	~5.7%
Black or African American	<1%



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Demographic Indicator	Value
Two or More Races / Other	~4%
Persons with a Disability	~13%
Households Below Poverty Line	~7.5%
Median Household Income	~\$76,000
Households Without Vehicle Access	~3%
Limited English Proficiency	~1%

The population density map of Park County, Colorado, indicates that the majority of the county is very sparsely populated, with less than five people per square mile across most of the landscape. Population clusters are primarily concentrated in the northeastern part of the county, particularly near the Jefferson and Teller County borders, where densities reach up to 600 people per square mile. This distribution has important implications for hazard mitigation planning. The predominance of low-density areas suggests that hazard events such as wildfires, flooding, and severe winter storms may impact small, dispersed populations, which can complicate evacuation and emergency response efforts. These remote areas often have limited infrastructure and access, making resilience-building and emergency services delivery more challenging. Conversely, the higher-density communities, such as those along the US 285 corridor and near Bailey, should be prioritized for risk reduction measures, public outreach, and the development of sheltering and continuity-of-service plans. The growth pressure along transportation routes further underscores the need to monitor and manage development in hazard-prone areas, especially within the Wildland-Urban Interface. Overall, Park County's population distribution highlights the need for a dual approach to mitigation: one that strengthens emergency capacity in remote areas while enhancing protective measures in the more densely settled northeastern communities.

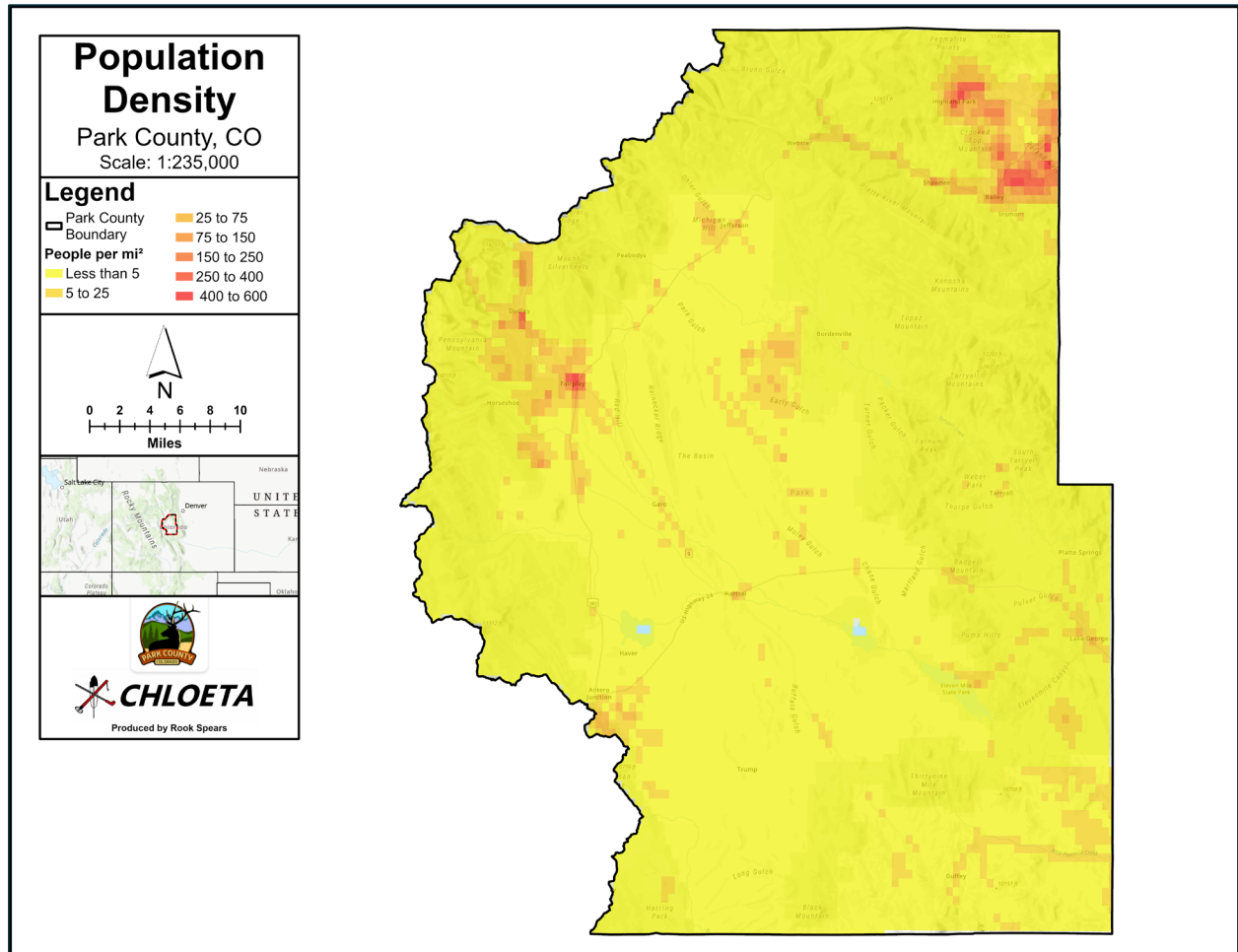


Figure 3. Population Density

Vulnerable Populations

Park County is home to several population groups that may face heightened risks during emergencies and disasters due to age, health status, economic barriers, or geographic isolation. As of the latest census estimates, approximately 26% of the population is over age 65, and about 13% of residents have a disability, indicating significant needs for accessible communications, mobility assistance, and medical support during hazard events. The county's rural nature and low population density mean that many residents live far from emergency services, with limited access to healthcare, transportation, or broadband.

While the proportion of individuals with limited English proficiency is low (about 1%), inclusive planning remains essential to ensure all populations receive timely warnings and preparedness resources. Additionally, around 7.5% of households live below the poverty line, and an estimated 3% of households lack vehicle access, further compounding vulnerability during evacuation or recovery phases.



These demographic characteristics reinforce the need for tailored outreach, accessible shelters, and continuity planning that prioritizes equitable response and recovery for all community members. Mitigation strategies should incorporate the needs of these populations to build a more resilient and inclusive Park County.

[Add Map](#)

Figure 4. Vulnerable Population Density

Economy and Tax Base

Park County's economy is driven by a mix of residential property values, tourism, outdoor recreation, small businesses, and limited natural resource industries. Unlike more urbanized counties, Park County does not rely heavily on large-scale commercial or industrial sectors.

Instead, its economic activity is anchored in property taxes from second homes and retirees, service-sector employment, and tourism-related revenue linked to hiking, camping, hunting, and fishing in the Pike National Forest and South Park Basin.

The residential and vacation home market forms the largest portion of the county's tax base, making property values and seasonal fluctuations a key economic vulnerability. Local retail, construction, real estate, and hospitality businesses are sensitive to both natural disasters and broader economic trends. Agriculture and small-scale ranching remain active in the South Park Valley but represent a small share of the overall tax base.

Major employers include county government, school districts, and small local businesses. The county's reliance on transportation corridors like U.S. Highway 285 for economic access makes it vulnerable to weather disruptions, wildfire closures, or infrastructure damage. Maintaining economic resilience requires hazard mitigation strategies that protect critical access routes, sustain tourism, and ensure continuity of government services and housing stability.

Table 12. Economic Statistics

Statistic	Number
Median Household Income	~\$76,000
Mean Household Income	~\$92,000 (estimate)
Poverty Rate – All Families	~7.5% (estimate)
Poverty Rate – All People	~9.2% (estimate)

Land Use

Park County's land use is primarily characterized by vast open spaces, public lands, and low-density rural development. Approximately 80% of the county's land area is publicly owned, with large portions managed by the U.S. Forest Service and Bureau of Land Management. These public lands include national forests, wilderness areas, and recreational lands that limit development and provide ecological buffers against natural hazards. The remaining 20% of land consists mostly of residential properties, agricultural uses, and small community centers.



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Residential development is concentrated in unincorporated subdivisions such as Bailey, Indian Mountain, and Jefferson, as well as in the incorporated Town of Fairplay. Many of these areas are located in the wildland-urban interface (WUI), making them particularly vulnerable to wildfire. Agricultural lands, primarily located in the South Park Basin, support grazing and hay production, and serve as important floodplain and habitat corridors.

Future land use in Park County is guided by the Park County Strategic Master Plan and zoning regulations, which aim to preserve the county's rural character while allowing for responsible growth. Hazard mitigation planning plays a key role in shaping land use decisions to reduce vulnerability to wildfire, flooding, erosion, and other natural hazards.

Table 13. Distribution of Value by Property Use

Property Use	2025 Value (\$)	% of Current Roll
Residential	\$338,500,000	16.7 %
Commercial	\$11,300,000	0.6 %
Industrial	\$150,000	< 0.1 %
Agricultural	\$10,200,000	0.5 %
Public / Institutional (Exempt)	\$714,000,000	35.3 %
Other (Vacant land, mixed use, mobile home, mining, etc.)	\$947,200,000	46.9 %
Total Assessed Value	\$2,021,374,457	100 %

Notes:

- Public/Institutional” corresponds to “Exempt” parcels (government, schools, utilities, etc.).
- Other aggregates Vacant Land, Mixed-Use, Mobile Home, and Mining categories, which collectively represent nearly half of the total assessed value.
- 2025 values are carried forward at nominal value (rounded to nearest \$100,000) for plan consistency.

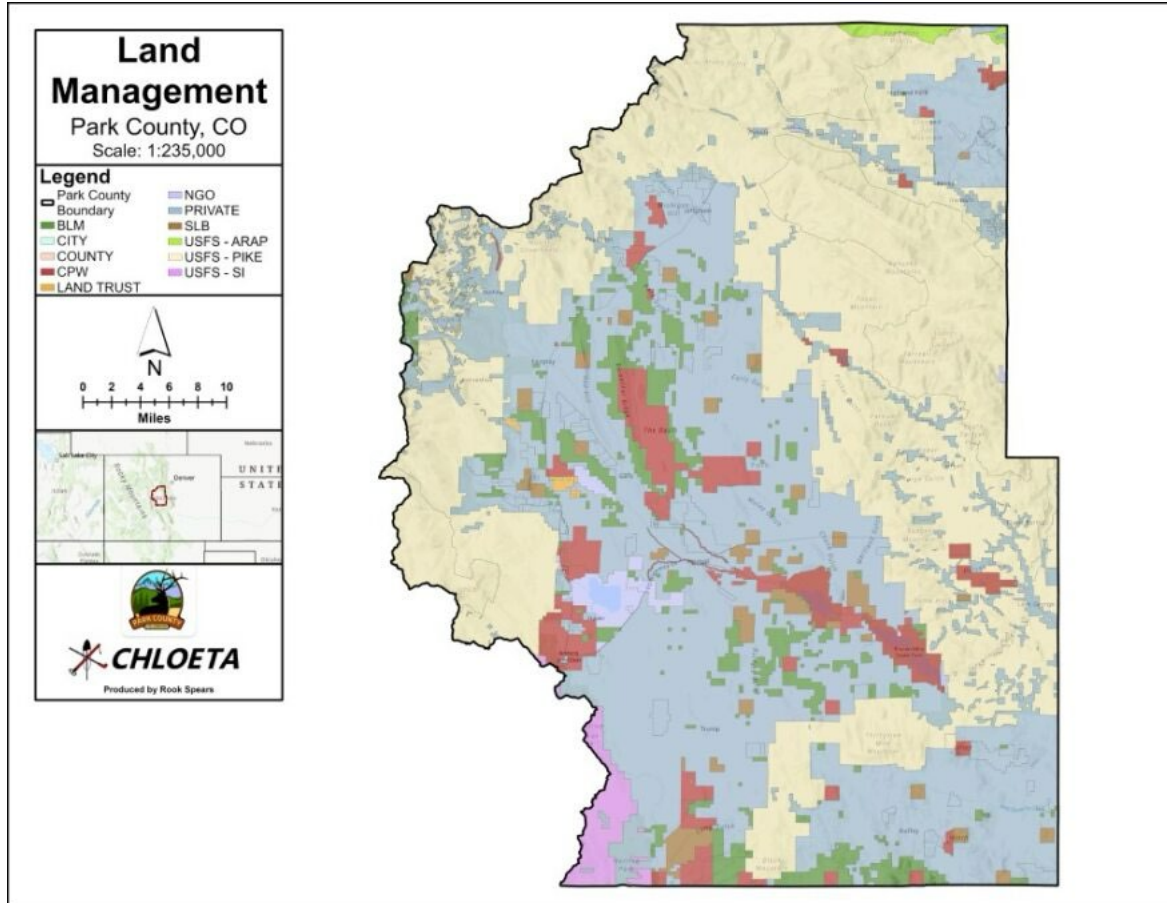


Figure 5. Park County Land Management

The land management map (Figure 4) of Park County, Colorado, illustrates a diverse mosaic of public and private land ownership, which significantly influences hazard mitigation planning and emergency response strategies. A substantial portion of the county is federally managed, with large tracts administered by the U.S. Forest Service (including the Pike, Arapaho, and San Isabel National Forests) and the Bureau of Land Management (BLM). These federal lands, depicted in various shades of green, blue, and red, dominate the central and western portions of the county and are primarily forested and mountainous, making them particularly vulnerable to wildfires, erosion, and limited access during hazard events.

State-managed lands, including those overseen by Colorado Parks and Wildlife (CPW) and the State Land Board (SLB), are interspersed throughout the county, along with smaller areas managed by county or city authorities, nonprofit land trusts, and private landowners. Private land, shown in beige, is most prevalent in the northeastern and southeastern corners of the county often overlapping with the more densely populated areas, which may face a higher risk of development in hazard-prone zones, especially within the Wildland-Urban Interface.



This complex land ownership pattern presents both opportunities and challenges for hazard mitigation. Coordination among federal, state, local, and private stakeholders is essential for implementing effective wildfire fuel management, maintaining evacuation routes, and aligning land use policies with risk reduction goals. In particular, fire mitigation and access improvements on interspersed parcels require collaborative planning to ensure continuity of protection across jurisdictional boundaries. Additionally, understanding land ownership helps prioritize infrastructure investments and public education campaigns, especially in transition zones between public wildlands and private residential areas. Overall, the county's land management structure underscores the need for integrated, multi-jurisdictional mitigation strategies tailored to the unique ownership and stewardship responsibilities within Park County.

Infrastructure

Park County's infrastructure network is shaped by its rural, mountainous terrain and dispersed population centers. The county is primarily accessed via U.S. Highways 285 and 24, the main transportation corridors that supports daily commuting, tourism, commercial activity, and emergency evacuation. Secondary routes include State Highway 9, County Road 77, and multiple mountain passes, which are vulnerable to closures due to snow, rockslides, or wildfire. The Town of Fairplay also maintains a small municipal airport, which supports general aviation and emergency operations.

Unlike urban counties, Park County lacks major rail lines or public transit infrastructure. Broadband and cellular coverage are limited in many areas, creating challenges for emergency communication, especially in remote or forested regions. Utilities are provided through a mix of cooperatives and special districts. Mountain View Electric Association supplies electricity to much of the county, while natural gas is limited, with many residents relying on propane. Water infrastructure varies incorporated areas like Fairplay and Alma are served by municipal systems, but most unincorporated communities depend on private wells and septic systems.

Solid waste disposal is coordinated through regional transfer stations, and emergency services—including fire protection and EMS, are provided by special districts. Many critical infrastructure assets, such as roads, power lines, and water systems, are susceptible to disruption from wildfire, winter storms, flooding, and aging conditions. Ensuring the resilience and continuity of these systems is essential to the county's safety and sustainability. Hazard mitigation strategies must prioritize protection of lifelines, expansion of communications access, and maintenance of evacuation routes.

Hazardous Materials

Park County contains multiple facilities, roadways, and operational sites where hazardous materials are used, stored, or transported, posing potential threats to human health, infrastructure, and natural ecosystems. These substances include fuels, industrial chemicals, mining byproducts, agricultural pesticides, and household hazardous waste. The most common transport routes for hazardous materials include U.S. Highway 285 and State Highway 9, both of which traverse populated and environmentally sensitive areas.



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Fixed-site facilities such as propane distribution centers, fuel storage tanks, transfer stations, and wastewater treatment plants present additional risks in the event of mechanical failure, fire, or natural hazard disruption. While Park County lacks major rail corridors, it is still indirectly exposed to hazardous materials incidents due to the proximity of freight lines and material transport through neighboring counties.

Park County's Planning Committee works in coordination with local fire protection districts, EMS agencies, and the Colorado Department of Public Health and Environment (CDPHE) to ensure compliance with Tier II hazardous materials reporting requirements under the Emergency Planning and Community Right-to-Know Act (EPCRA). Ongoing interagency coordination, responder training, and community outreach are vital to minimizing risks and preparing for potential spills or releases that could impact residents, water systems, or critical infrastructure.

Future Trends in Development

Park County is expected to experience gradual but sustained growth in residential development, particularly in unincorporated communities such as Bailey, Fairplay, and Hartsel, due to their proximity to the Denver metropolitan area and appeal as mountain retreats or retirement destinations. The county continues to see increased interest in vacation homes, remote work properties, and seasonal cabins, often located in wildland-urban interface (WUI) zones, which raises concerns about wildfire risk and infrastructure strain.

Infrastructure expansion including broadband access, energy delivery systems, and transportation improvements is anticipated to support both year-round and seasonal populations. However, much of the projected development will occur in areas with limited emergency access, aging road networks, or environmental sensitivity, such as high-elevation forests or flood-prone valleys.

As weather change and economic trends influence housing markets and land use, Park County is likely to face increased pressure on water resources, emergency services, and transportation corridors. These trends underscore the importance of integrating hazard mitigation strategies into zoning, permitting, and land use planning to ensure future development reduces, not increases, exposure to natural hazards.

Employment and Industry

Park County's employment landscape is shaped by its rural character, natural amenities, and proximity to the Denver metropolitan region. The largest employment sectors in the county include government services, education, construction, retail trade, healthcare, and accommodation and food services, many of which are closely tied to seasonal tourism and outdoor recreation. A significant number of residents are also self-employed or work remotely, particularly in professional and technical services, due to improved broadband access in select areas.

Government, including county departments, school districts, and emergency services, accounts for a substantial portion of local jobs and provides critical continuity functions during disasters. Additionally, the construction and real estate industries have seen growth in response to rising demand for housing, especially in unincorporated areas like Bailey and Indian Mountain.



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Agriculture and ranching, while historically central to Park County's identity, now represent a small share of employment but remain important to the local economy and land stewardship. Mining has largely declined, with only limited operations still active.

The county's reliance on a limited and dispersed employment base creates economic vulnerabilities, especially during disruptive events such as wildfires, floods, or prolonged road closures. Supporting business continuity, protecting workforce centers, and ensuring access to lifeline sectors are critical for building economic resilience in Park County.

Table 14. Major Employers

Industry	Estimated Employment	Percentage of Total Employment
Government / Public Administration	~1,000	~17%
Educational Services	~600	~10%
Health Care & Social Assistance	~500	~8%
Retail Trade	~400	~7%
Construction	~350	~6%
Accommodation & Food Services	~300	~5%
Professional, Scientific & Technical Services	~250	~4%
Agriculture, Forestry, Fishing & Hunting	~200	~3%
Administrative & Support / Waste Management Services	~180	~3%
Real Estate & Rental & Leasing	~160	~3%
Other Services (Except Public Administration)	~150	~2%
Transportation & Warehousing	~140	~2%
Finance & Insurance	~120	~2%
Manufacturing	~100	~1.5%
Utilities	~80	~1%
Information	~60	~1%
Wholesale Trade	~50	<1%
Management of Companies & Enterprises	~20	<1%

Note: Percentages are approximate and may not sum to 100% due to rounding.



Disaster Declarations

One method to assess hazard risk is to examine historical events that have resulted in state or federal disaster declarations within Park County. A disaster declaration is typically granted when the severity and magnitude of an incident exceed the ability of local agencies to respond and recover effectively. When local capacity is overwhelmed, the Governor of Colorado may issue a state disaster declaration, which can authorize the deployment of state-level assistance and emergency resources. If the combined local and state resources are still insufficient, a federal disaster declaration may be requested through the Federal Emergency Management Agency (FEMA).

Federal declarations may also be issued by the U.S. Department of Agriculture (USDA) in response to agricultural losses, or by the Small Business Administration (SBA) to support business recovery. In addition to major disaster declarations, FEMA may issue emergency declarations, which provide more limited forms of assistance and are often used for immediate response measures such as evacuation or sheltering.

The number and type of disaster declarations serve as valuable indicators of recurring or severe hazards that impact Park County. This section reviews FEMA, USDA, and SBA declarations affecting the planning area to support prioritization of mitigation strategies and identify trends in hazard frequency, severity, and economic impact.

Table 15. Disaster Declarations (1997-2025)

Incident Date	Hazard Type	Declaration	Estimated Expenditures
July 1997	Flash Flood (Buffalo Creek)	FEMA DR-1187-CO	~\$750,000
June 2002	Wildfire (Hayman Fire)	FEMA DR-1421-CO	~\$2 million (regional)
March 2003	Snowstorm / Blizzard	FEMA DR-3173-CO	~\$300,000
September 2013	Severe Storms / Flooding	FEMA DR-4145-CO	~\$125,000 (localized)
March 13, 2020	COVID-19 Pandemic	FEMA DR-4498-CO	~\$500,000+ (ongoing)
September 2020	Wildfires (Regional Impact)	FEMA DR-4561-CO	~\$1.2 million (regional)
February 2021	Severe Winter Storm	FEMA DR-4592-CO	~\$300,000 (localized)
July 2022	Flash Flooding	FEMA DR-4665-CO	~\$150,000 (localized)
June 2023	Wildfire (Local Incident)	State Declaration Only	~\$200,000 (estimated)
February 2025	Severe Winter Storm	FEMA DR-4870-CO	~\$400,000 (estimated)



Notable Declarations:

Over the past several decades, Park County has experienced multiple state and federal disaster declarations that underscore its vulnerability to a range of natural and human-caused hazards. One of the most impactful events was the 2002 Hayman Fire, the largest wildfire in Colorado history at the time, which triggered FEMA Disaster Declaration DR-1421-CO and prompted widespread evacuations, air quality concerns, and regional economic disruption. In March 2003, a severe snowstorm led to DR-3173-CO, highlighting the county's susceptibility to prolonged winter weather events and transportation challenges in remote areas.

More recently, the COVID-19 pandemic (DR-4498-CO) marked a significant shift in emergency operations, requiring public health coordination, continuity of government, and long-term recovery assistance. In 2020 and 2021, a combination of regional wildfires (DR-4561-CO) and a severe winter storm (DR-4592-CO) tested local response capabilities and further emphasized the need for year-round hazard preparedness. A state-level declaration in 2023 for a wildfire incident in Park County reinforced the growing risk posed by development in wildland-urban interface (WUI) areas.

These events, among others, demonstrate the diversity of threats Park County faces and provide critical context for shaping hazard mitigation strategies aimed at protecting infrastructure, natural resources, and public safety.



Chapter Two: Hazard Identification, Risk & Vulnerability

Introduction

For this plan, the Emergency Services (ES) Council considered the full range of natural hazards that could impact the planning area and then listed hazards that present the greatest concern identified by stakeholders and the public. The process incorporated review of state, county and hazard planning documents, as well as information on the frequency, magnitude and costs associated with hazards that have impacted or could impact the planning area. Anecdotal information regarding natural hazards and the perceived vulnerability of the planning area's assets to them was also used. Based on the review, the ES Council confirmed the hazards to be addresses in this plan as follows:

Table 16. County Hazards

Hazard Category (Colorado HMP)	Hazard to Profile (Park County Specific)	Justification for Inclusion
Wildfire	Wildfire	Most significant hazard; frequent regional wildfires; WUI exposure increasing
Severe Winter Weather	Severe Winter Storms (Ice Storms, Blizzards)	High-elevation terrain leads to prolonged storms, road closures, and power outages
Flooding	Flood (Flash & Riverine)	South Platte River headwaters; steep drainages; past disaster declarations
Drought	Drought	Periodic droughts affect water supply, fire conditions, and agriculture
Geologic Hazards	Geologic Hazards (Landslides, Rockfalls, Avalanches)	Mountain slopes, snowpack, and freeze-thaw cycles present seasonal risks
Windstorm	High Winds, (Downslope/Chinook Winds)	Basin exposure creates vulnerability to structure and vegetation damage
Thunderstorm (Lightning & Hail)	Thunderstorm (Lightning & Hail)	Common during dry thunderstorms; ignition source for wildfires. Frequent in summer; damages property, vehicles, and agriculture
Extreme Temperatures	Extreme Temperatures (Cold & Heatwaves)	Wide annual temperature swings; risks to elderly and critical infrastructure
Biological Hazards	Pandemic, Infectious Disease Outbreaks	COVID-19 and potential zoonotic or waterborne diseases impacting public health
Earthquake (Low Risk)	Earthquake	Low probability but required for completeness and federal alignment



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Hazard Category (Colorado HMP)	Hazard to Profile (Park County Specific)	Justification for Inclusion
Dam Failure	Dam Failure	Failure of Dam or release due to flooding

This HMP evaluates a range of natural and human-caused hazards that present the most significant risk to the planning area, based on historical events, geographic and environmental factors, and anticipated future conditions. Hazards such as wildfire, severe winter weather, flooding, drought, hazardous materials incidents, landslides, high wind events, and extreme temperatures were prioritized due to their recurrence, documented impacts, and alignment with local vulnerabilities and Colorado's State Hazard Mitigation Plan.

While FEMA's guidance outlines a comprehensive list of hazards—including tsunamis, coastal erosion, and hurricanes—these were excluded from this plan due to Park County's inland location, high-elevation terrain, and lack of exposure to oceanic or coastal influences. Additionally, hazards such as tornado were screened out after reviewing local infrastructure and determining that no high-risk structures currently exist within the planning area.

Focusing the risk assessment on the most relevant, likely, and damaging hazards allows Park County and its partners to better allocate resources, improve mitigation strategies, and strengthen community resilience against the threats most likely to affect residents, property, and critical infrastructure.

Each hazard profile follows a consistent, structured format to ensure a thorough understanding of risk. Profiles begin with a hazard description and general overview, followed by a historical account of past events in Park County and surrounding areas to identify trends and recurrence. The profiles also map and describe geographic areas of concern, highlighting terrain, elevation, land use, and population characteristics that may increase vulnerability.

To assess risk, each profile includes:

- Frequency and Probability Estimates – The average number of events per year and the likelihood of future occurrences.
- Severity Rating – Potential impacts on infrastructure, transportation systems, emergency services, and public safety.
- Warning Time Evaluation – An estimate of how much lead time is typically available before onset, which affects community preparedness and response.
- Vulnerability Assessment – Evaluation of how people, housing, economic sectors, natural resources, and critical infrastructure may be affected.

This standardized approach supports a comprehensive and consistent risk analysis that informs mitigation strategies, land use planning, emergency preparedness, and resource allocation across the planning area.



Hazard: Wildfire

Background

Park County is among Colorado's most wildfire-prone counties due to its extensive wildland-urban interface (WUI), dense forest cover, and dry, windy climate. The county has experienced several major wildfires over the past two decades, including the Hayman Fire's regional impacts and more localized events near Bailey and Lake George. Prolonged drought, beetle-killed forests, and increasing development in fire-prone areas contribute to elevated risk. Wildfire ranked as the #1 hazard of concern in Park County based on the 2025 Hazard Ranking Worksheet, reflecting its countywide exposure, recurrent events, and high potential for life-safety impacts.

Definition

The planning area hereby adopts the definition as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Location and Extent

The threat of wildfires is a significant concern throughout Colorado, and Park County is no exception. The county's forests, grasslands, and wildland-urban interface (WUI) areas are all at risk. The WUI, where homes meet or intermingle with undeveloped wildland or vegetative fuels—presents a heightened risk for wildfire-related impacts, including the potential destruction of property and threats to public safety.

The [Colorado State Forest Service](#) (CSFS) updated its Colorado Forest Atlas. Through the Wildfire Risk Viewer (Public) tool, users can assess wildfire risk for specific areas within Park County. One key category, "wildland urban interface risk" (found under Wildfire Effects Themes), measures the potential impact of wildfire on people and their homes. This tool is a valuable resource for understanding localized wildfire risk and planning for mitigation and preparedness.

Park County faces varying levels of Wildland Urban Interface (WUI) wildfire risk (Figure 6), with concentrations of Low to Moderate Risk across much of the county and pockets of High to Highest Risk primarily along the Highway 285 corridor, the northern boundary with Summit County, and in forested residential areas. These higher-risk zones reflect areas where homes are intermingled with dense vegetation, increasing the potential for wildfire damage. Central portions of the county, such as the South Park Basin, exhibit lower risk due to sparse development and grassland landscapes. This spatial variation underscores the need for targeted wildfire mitigation strategies, community education, and land use planning in the county's most vulnerable WUI zones.



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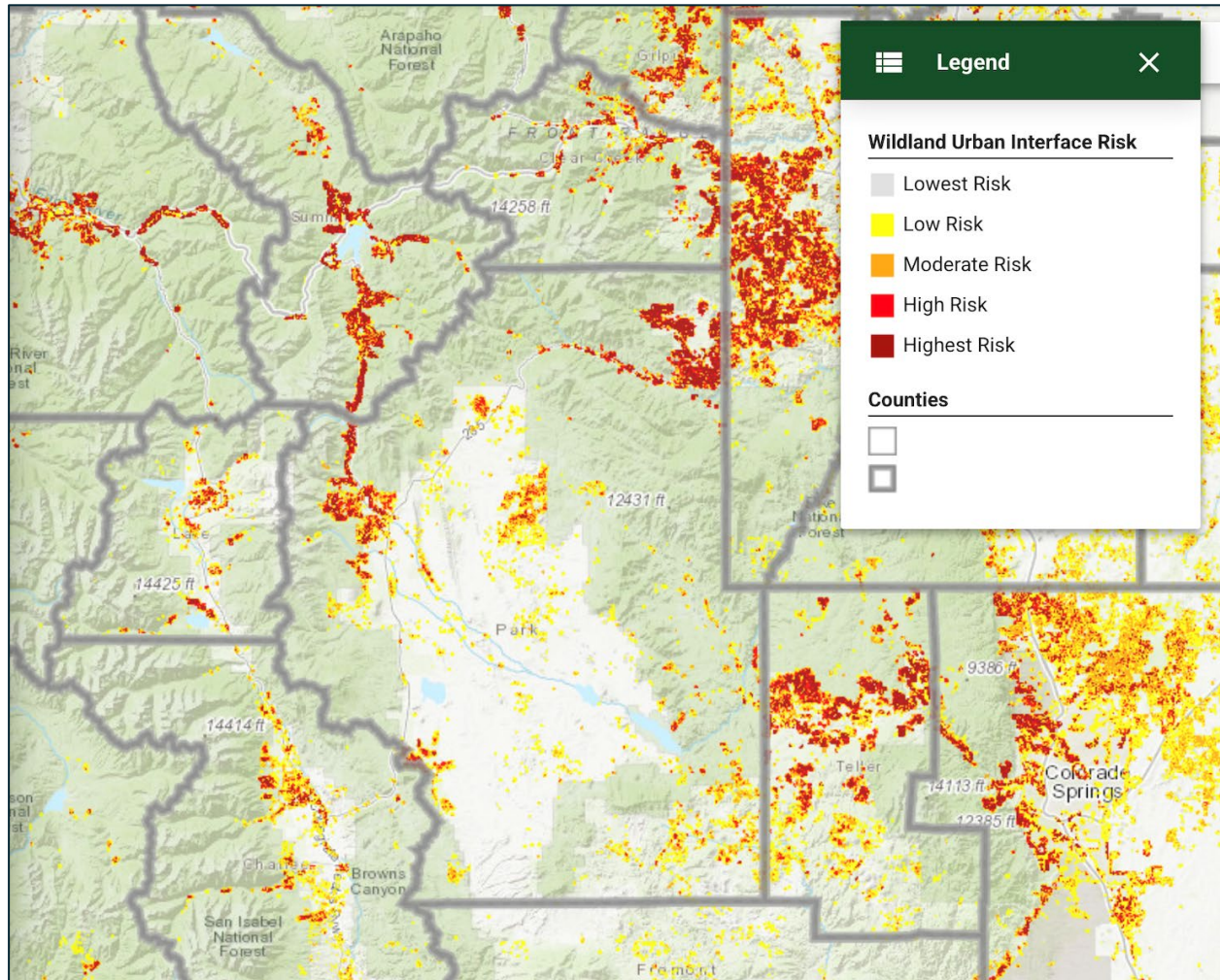


Figure 6. WUI Risk Areas, Park County

Park County faces a range of wildfire risks across its landscape, with notable concentrations of High and Highest WUI Risk areas in the northern, eastern, and southern portions of the county especially along the Highway 285 corridor and near forested residential zones. These high-risk areas are consistent with statewide patterns seen along the Front Range, where many counties, including Park, Teller, and Jefferson, are experiencing increased wildfire vulnerabilities due to expanding development in WUI areas.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, Park County falls within the 4.2% to 6.9% range for total land area classified as High or Highest Wildland Urban Interface (WUI) Risk, as indicated by the orange shading on the statewide WUI risk map Figure 8. This places Park County in a moderate risk category compared to other counties along the Front Range. Neighboring counties such as Teller and Douglas are in the highest risk category, with 7.0% to 15.0% of their land designated as high-risk WUI areas, while Fremont and Chaffee Counties share the same risk range as Park. This classification indicates that although Park County is not among the most extreme in terms of high-risk WUI coverage, a notable portion of its development intersects with fire-prone wildland vegetation.



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The State HMP also shows projected population growth through 2030, which may influence future WUI expansion and associated risk across Park County. This underscores the importance of targeted wildfire mitigation efforts, fuel management practices, and land use planning tailored to WUI zones, particularly as residential growth continues into the county's forested and mountainous areas.

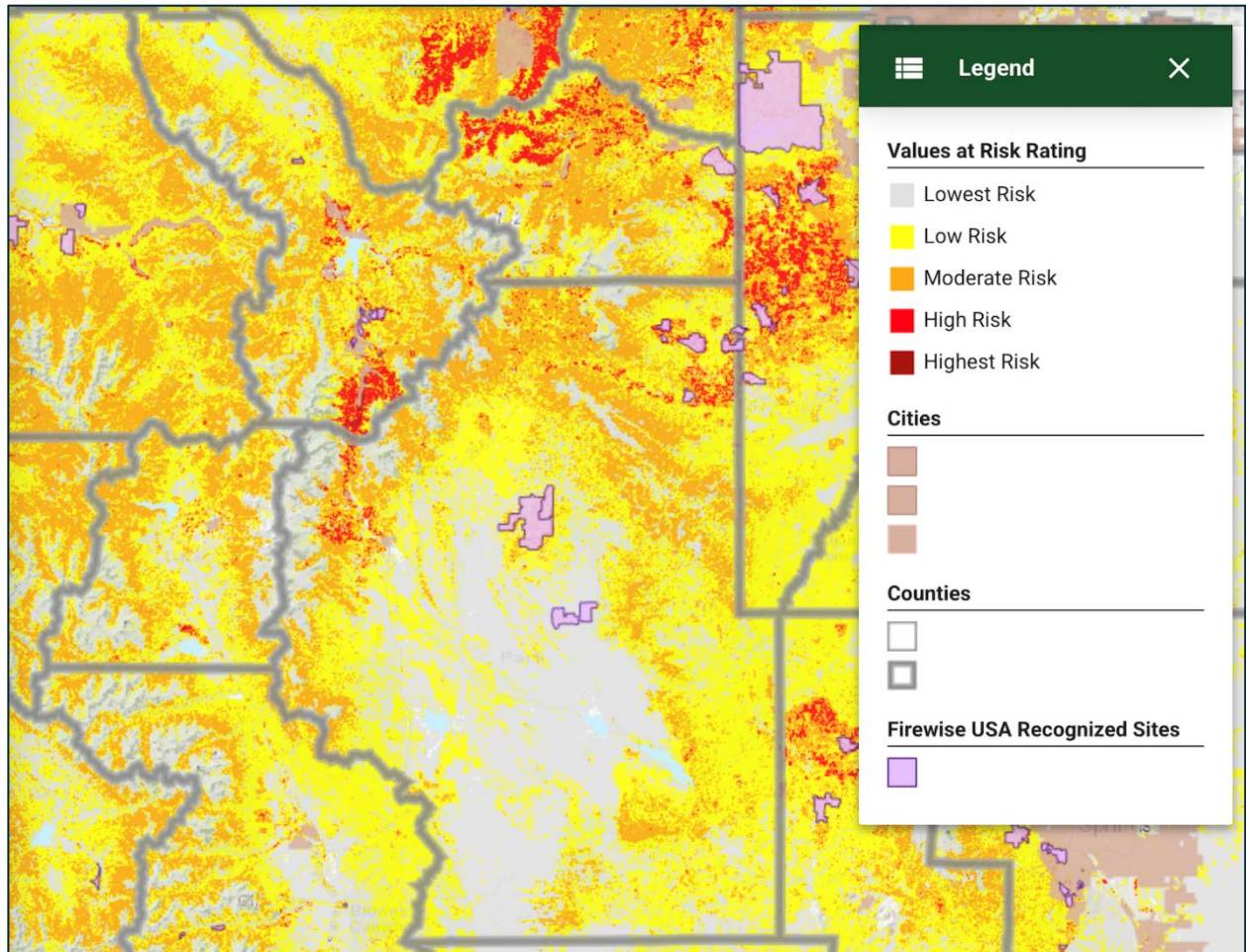


Figure 7. Park County Wildfire Risk



Park County Hazard Mitigation Plan 2025

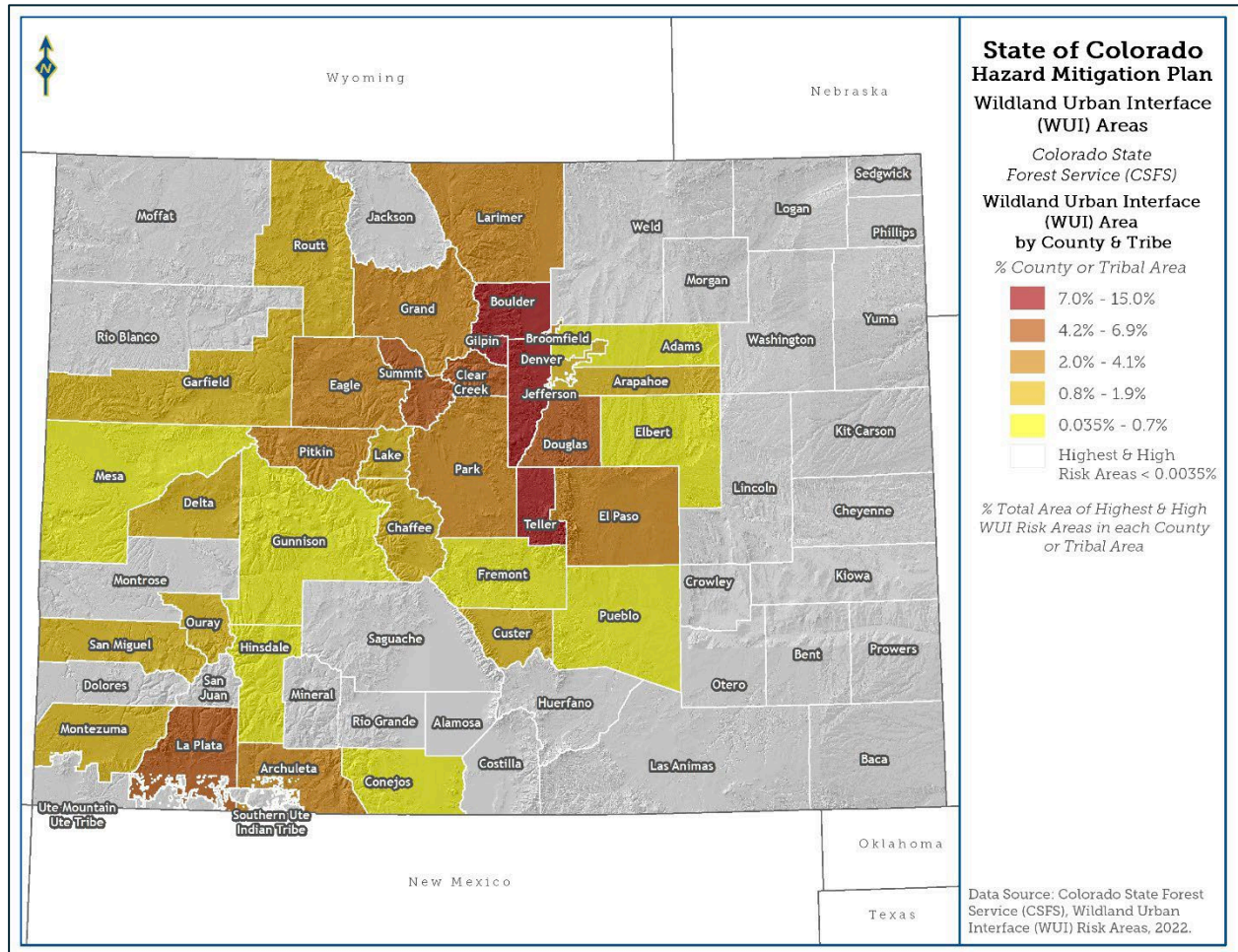


Figure 8. State Highest WUI Risk Areas



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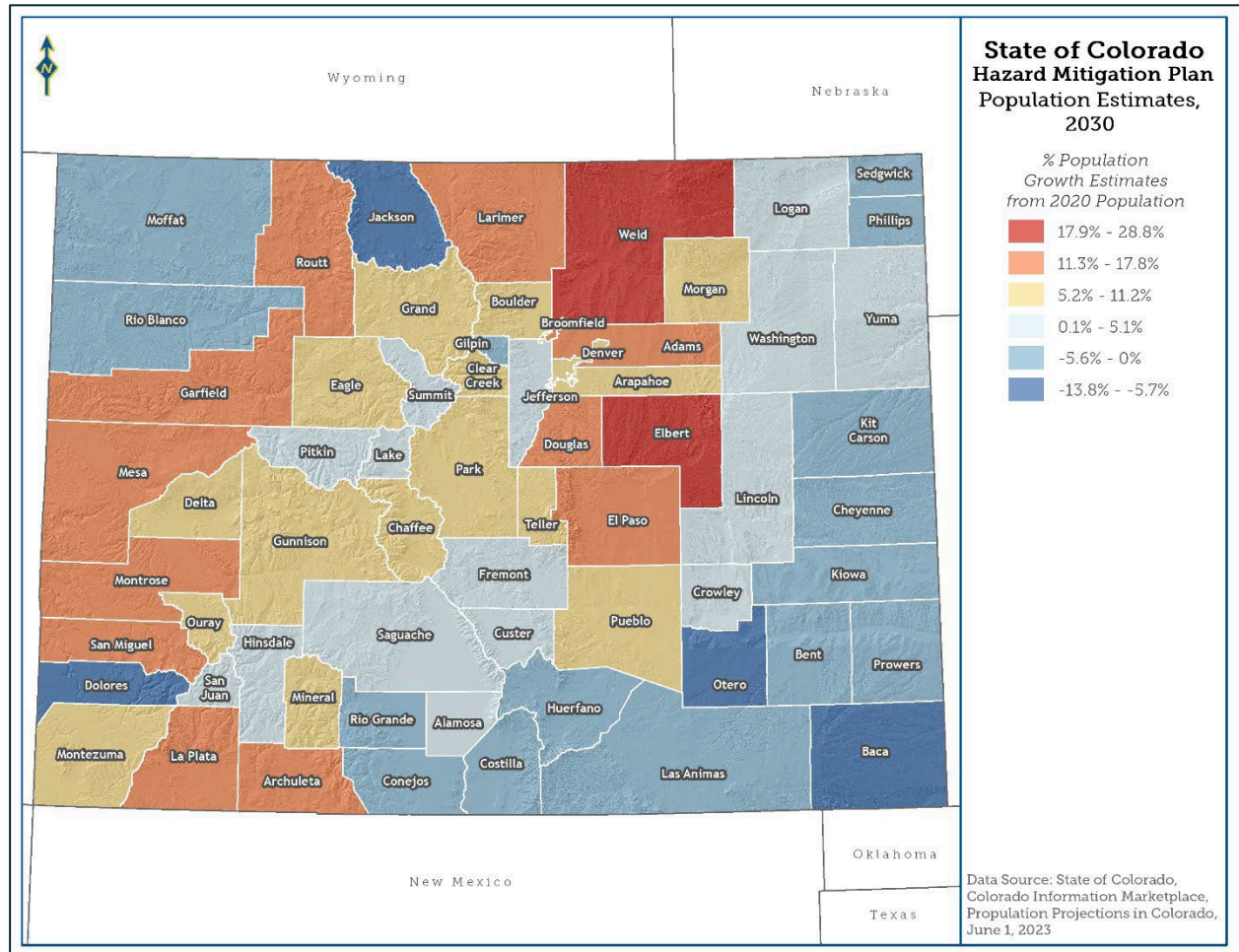


Figure 9. State Population Growth

Previous Occurrences

According to the National Interagency Fire Center (NIFC), Colorado has recorded more than 9,500 wildfires since 2009, including numerous incidents affecting or threatening Park County. (Figure 10) presents wildfires over 100 acres in size, tracked between 1992 and 2025. The Colorado State Forest Service Wildfire Risk Viewer also provides access to historical wildfire data relevant to Park County, including ignitions and burn perimeters. The state's 20 largest wildfires have all occurred within the last 20 years, with over half taking place since 2016 underscoring the urgency of mitigation efforts at both state and local levels.

Add Map

Figure 10. Historical Fires Map



Park County Hazard Mitigation Plan 2025

Table 17. Previous Occurrences (Wildfires 2020 to Present) summarizes documented wildfire events in Park County, reflecting key impacts and historical trends over the past two decades. Events include significant wildfires such as the Hayman Fire (2002), which extended near Park County, as well as more localized incidents like the High Chateau Fire (2018) and the Elephant Rock Fire (2020). While there have been no recorded wildfire-related fatalities in the county during this period, minor injuries have occurred, typically involving first responders or residents during evacuations and suppression activities. Property damage figures account for structural losses and firefighting or recovery costs. Due to Park County's limited agricultural activity, crop damage has been negligible. Prior reports refer to previously documented wildfire incidents available through sources such as the National Interagency Fire Center (NIFC) and the Colorado State Forest Service (CSFS).

Table 17. Previous Occurrences (Wildfires 2020 to Present)

Name of Fire	Ignition Date	Location / Area	Acres Burned (approx.)	Cause / Notes / Impacts
821 Fire	28 September 2024)	Lost Creek Wilderness, Park County (south of Hwy 285 / Kenosha Pass)	~ 5 acres	Grass / timber–aspen terrain; responded by USFS & local agencies; no structures threatened. (5280Fire)
403 Fire	~ 5 April 2023 (reported 4 April 2023)	South of Lake George (Park + Teller Counties), Pike National Forest	1,518	Human-caused; burned in grass / ponderosa pine; ~60% contained at report time; joint incident management by USFS, Park County, DFPC. (Park County) (9 News)
Elephant Rock Fire	2020	Near Lake George	50	Evacuations issued, limited spread
Wilkerson Fire	18 September 2018	Near Wilkerson Pass	25	Burned near Wilkerson Pass; minor suppression costs.
Weston Pass Fire	28 June 2018	Near Granite, southwest of Fairplay	13,023	Lightning-caused; evacuation impacts; rare high-elevation tornado reported.
Lake George Fire	10 June 2012	Lake George area	40	Local wildfire near expanding WUI.
Springer Fire	June 2012	~3.5 miles from Lake George, Pike NF	1,145	Threatened watershed / recreation zones.



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Name of Fire	Ignition Date	Location / Area	Acres Burned (approx.)	Cause / Notes / Impacts
Nash Ranch Fire	24 June 2008	East of Guffey / Jefferson line	1,000	Grass / timber fire near rural parcels.
Camel Fire	8 July 2003	Guffey area	510	Mixed conifer fuels near residential zones.
Campbell Fire	8 July 2003	~15 miles NE of Guffey	505	Typical summer fire in dry fuels.
Snaking Fire	23 April 2002	Behind Platte Canyon High School (Bailey area)	2,590	Close to community access routes.
Black Mountain Fire	5 May 2002	Northeast Park County	345	Smaller forest fire in rugged terrain.
Hayman Fire (Park-Teller-Jefferson region)	June 2002 (seasonal)	Across multiple counties including portions of Park	~ 137,760 (total for region)	Among Colorado's largest wildfires; extensive ecological, air quality, and suppression impacts.
High Meadow Fire	12 June 2000	Bailey / nearby area	~ 4,000	Human-caused; impacted WUI zones and forest-wildland interface.

Previous Losses (2018–2025): Park County has experienced multiple notable wildfire events since 2018, including both large-scale incidents and smaller fires with local impacts. The most significant was the Weston Pass Fire, which ignited on June 28, 2018, near Granite, burning 13,023 acres. It prompted evacuations in subdivisions such as Campground of the Rockies and Black Mountain and resulted in secondary impacts, including flash flooding that temporarily closed U.S. Highway 285. Additionally, the Wilkerson Fire in September 2018 burned 25 acres near Wilkerson Pass, and in 2017, the Puma Fire (44 acres) also affected the area near Lake George.

While these fires were smaller than statewide incidents like the 2020 Pine Gulch and Cameron Peak fires, they highlight the recurring wildfire threat in Park County's Wildland Urban Interface (WUI). As documented in the 2023 Colorado Enhanced State Hazard Mitigation Plan, Park County shares similar vegetation and fuel conditions with higher-risk counties, and though its total WUI risk area is moderate, over 99.5% of its population lives within WUI zones, reinforcing vulnerability to wildfire damage.

Importantly, no wildfire-related deaths or major injuries were reported in Park County from 2018–2025, consistent with the historical record noted in the County's HMP. However, fires continue to result in evacuations, road closures, and secondary hazards such as debris flows and smoke exposure. These events underline the need for ongoing mitigation planning, especially as future wildfire activity is expected to intensify due to increasing development in fire-prone areas.



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Estimated costs for smaller fires in Park County are often unavailable unless a federal or state disaster declaration was issued. No wildfire-related deaths or major injuries were reported in the county between 2018 and 2025. Fires marked with (*) began in neighboring counties but still impacted Park County through evacuations, smoke, or fire line activity.

Disaster Declarations

Park County has not had a federal major disaster declaration (FEMA DR) specifically for wildfires. However, there have been wildfires that impacted the county and prompted local or state-level emergency responses, including those listed in Table 18.

Table 18. Disaster Declarations (Wildfires)

Fire Name	Year	Disaster Declaration	County of Origin	Acres Burned	How It Affected Park County
Hayman Fire	2002	FEMA DR-1421-CO	Jefferson/Teller	~138,000	Smoke, air quality issues, emergency planning overlap with county borders
High Chateau Fire	2018	State Emergency Response	Teller	~1,400	Evacuation warnings near county line, resource deployment
Elephant Rock Fire	2020	Local Emergency Response	Park	~50	Burned in Park County; evacuations and air response
Weston Pass Fire	2018	No federal declaration	Park/Lake	~13,000	Burned in Park County; evacuations, road closures, smoke impacts
403 Fire	2023	No federal declaration	Park	~1,400	Directly impacted Park County; evacuations, road closures, fire response
Buffalo Fire	2018	No federal declaration	Summit	~100	Smoke and air quality impacts in northern Park County

Probability of Future Occurrence

Wildfire is an annual occurrence in Park County, consistent with statewide trends in Colorado, indicating a 100% chance of wildfire potential each year. According to the Colorado State Forest Service (CSFS) 2020 Colorado Forest Action Plan, longer fire seasons and more uncharacteristic wildfires are expected to become increasingly common.



Uncharacteristic wildland fire refers to wildfire events that are larger, more intense, more resistant to control, or that occur in unexpected locations, compared to historical patterns. These shifts are largely influenced by factors such as weather changes, vegetation density, and past suppression practices.

The CSFS Colorado Forest Atlas Wildfire Risk Viewer (Public) provides localized assessments of wildfire risk. One important metric is “burn probability,” available in the Wildfire Risk Themes section of the viewer. This measure represents the annual likelihood of any specific area within Park County burning due to wildfire, offering a valuable tool for planners and residents to understand their relative exposure.

Future Costs

To better understand the economic impacts of wildfire under future climate conditions, the State of Colorado developed the Future Avoided Cost Explorer (FACE) tool. This tool estimates the expected costs of wildfire (as well as flood and drought) on various economic sectors through the year 2050, based on projected climate and population growth scenarios. These projections can inform cost-effective mitigation strategies for Park County, emphasizing the importance of proactive planning and investment in wildfire risk reduction.

In Park County, scenario modeling for wildfire impacts considers both building damages and suppression costs, which together represent the primary economic consequences of wildfire. These damages are calculated using a combination of wildfire hazard factors—such as burn probability and fire intensity—and asset vulnerability, particularly building replacement value. Suppression costs reflect expenditures needed to combat and contain wildfire incidents.

According to the Future Avoided Cost Explorer (FACE) tool, wildfire-related damages in Park County under varying population growth scenarios are projected as follows:

- Under current climate and population conditions, estimated annual damages total \$800,000, with \$50 per person in damages and a 1.0x change from current levels ().
- With medium population growth, damages increase to \$900,000 annually, or \$40 per person, reflecting a 1.1x increase.
- Under a high growth scenario, projected damages remain at \$900,000 annually, but per capita damages decrease to \$30, also reflecting a 1.1x increase from current levels.

These projections indicate that while total damages increase with population growth, the per-person economic burden decreases slightly due to population dilution. However, even modest increases in wildfire impacts present significant planning concerns—particularly for Park County, where a large portion of the population resides within wildland-urban interface (WUI) zones. As wildfire risk intensifies due to ongoing weather changes and increased development, understanding these trends is vital for mitigation planning, budgeting for emergency response, and long-term land use strategies.



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Table 19. Wildfire Future Costs with Population Growth

Scenario	Estimated Damages (\$)	Notes
High Growth	\$900,000	Projected damages under high growth model
Medium Growth	\$900,000	Projected damages under medium growth model
Current	\$800,000	Estimated damages based on current conditions

Risk and Vulnerability

Wildfire risk in the planning area is driven by three primary factors: the likelihood of ignition, the intensity of fire behavior once ignited, and the susceptibility of valued resources and assets to wildfire damage. Fire intensity varies widely across the region and is influenced by vegetation type, forest health, and topography. Figure 11 illustrates the fire intensity levels for Park County.

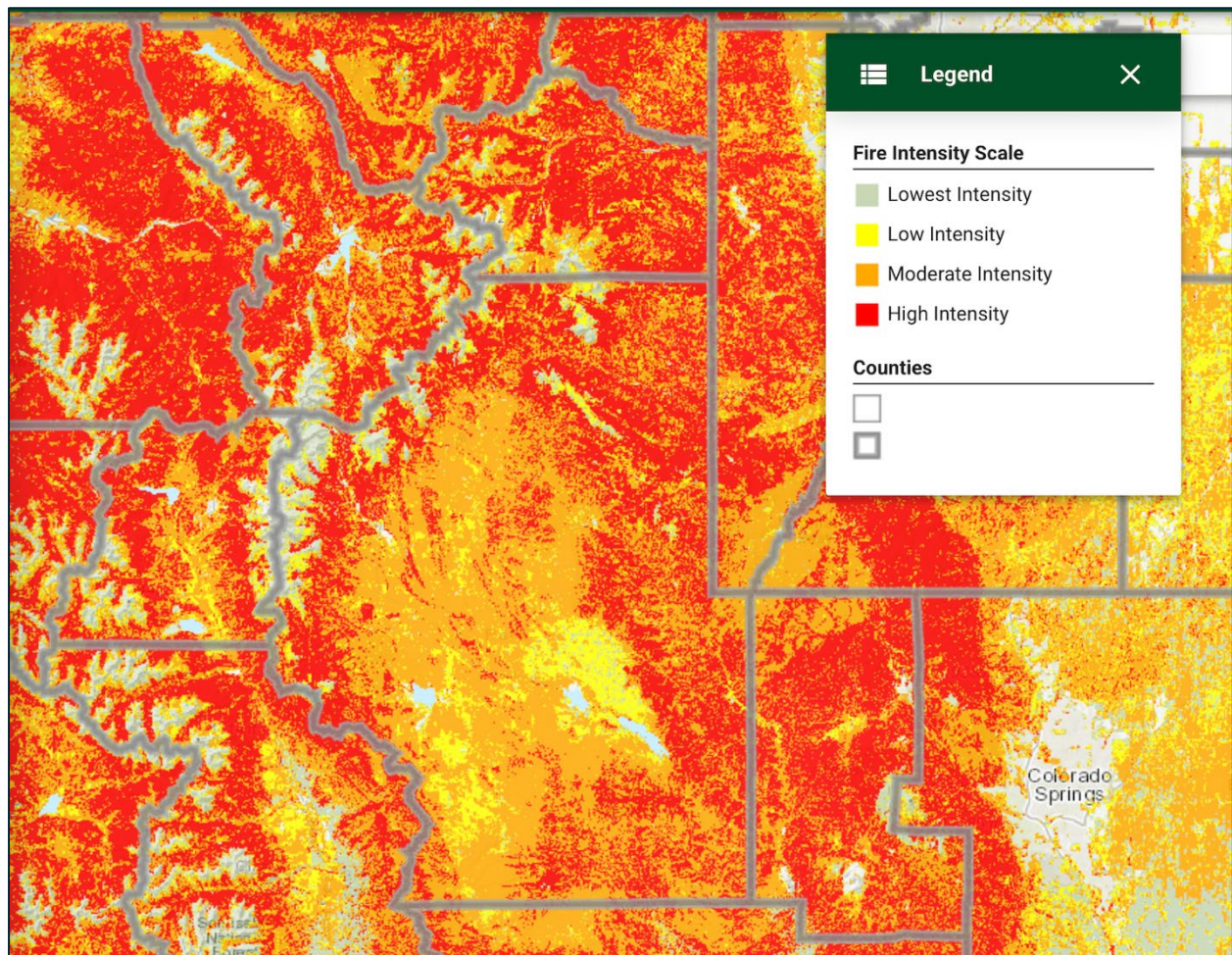


Figure 11. Park County Wildfire Intensity



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Like many areas across Colorado, Park County has seen increasingly erratic and damaging wildfire events over the past decade. This trend is fueled by a combination of prolonged drought, higher temperatures, and the accumulation of dry fuels, particularly in unmanaged or insect-affected forests. In Park County, stands of dense pine and mixed conifer forest have become increasingly vulnerable due to beetle kill and lack of natural low-intensity fire cycles.

Additionally, the planning area's exposure to post-wildfire hazards such as debris flows, landslides, and flooding is a growing concern, especially in areas where fire has stripped protective vegetation. These secondary effects can threaten infrastructure, water sources, and homes, creating long-term recovery and management challenges for the county.

Wildfire smoke also presents a public health hazard. Fine particulate matter (PM2.5) from wildfires can trigger or worsen respiratory illnesses and has been linked to premature deaths. This risk disproportionately affects vulnerable populations, including elderly residents, low-income households, and individuals with preexisting health conditions communities that are present throughout the planning area's rural and mountainous terrain.

Wildfire poses a significant threat to all populations living within or near wildfire-prone areas throughout the planning area. Of the county's estimated 17,718 residents, a substantial proportion live in the Wildland-Urban Interface (WUI) areas where human development meets or intermingles with wildland vegetation. According to the Colorado State Forest Service Wildfire Risk Index, nearly 50% of Park County's population resides in areas classified as Moderate to Highest WUI Risk.

Risk Breakdown (Park County)

- Moderate Risk: 32.4% of population
- High Risk: 23.6%
- Highest Risk: 16.0%
- Lower categories: Remaining 28% fall within low, lowest, or non-WUI areas

This distribution underscores the county's heightened vulnerability to wildfire, especially for populations that may face challenges during an evacuation or recovery. These include:

- Low-income individuals and households
- People without access to reliable transportation
- Older adults, children, and individuals with chronic health conditions
- Those with limited English proficiency or access to emergency communication technology

Compounding the risk is Park County's limited road infrastructure, especially in mountainous or rural subdivisions, where single-road ingress/egress routes can severely limit evacuation during a wildfire. Several communities have already been identified as having poor evacuation access, which raises the potential for residents to become isolated or trapped during fast-moving fire events.

According to the Colorado Forest Atlas Wildfire Risk Viewer, many areas of the planning area are classified as having moderate to very high building damage potential. These



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zones are most concentrated in the central, northern, and eastern portions of the county, particularly near communities such as Bailey, Lake George, and parts of Fairplay. The viewer's "Building Damage Potential" theme highlights regions where the combination of vegetation, topography, and development increases the likelihood of structural loss during a wildfire. Very high-risk areas are especially evident along the northeastern corridor and in residential pockets where dense forest meets housing. In contrast, the southern and western portions of the county, which are more sparsely developed, generally show lower structural risk. This data reinforces that a significant portion of Park County's population resides in areas where wildfire could cause substantial damage to buildings, underscoring the need for continued investment in home hardening, defensible space, fuel reduction, and evacuation planning to reduce wildfire vulnerability.

Although Park County does not currently include any officially designated "Disproportionately Impacted Communities" (DICs), data from the Colorado Forest Atlas Wildfire Risk Viewer reveals that several areas within the county exhibit overlapping indicators of elevated wildfire exposure and social vulnerability. Specifically, the map shows zones where high or very high building damage potential coincides with cross-hatched areas identified as socially vulnerable, including populations who may lack access to transportation, face economic hardship, or experience health and communication barriers. These overlapping vulnerabilities are of particular concern in regions with limited ingress and egress routes, where evacuation during wildfire events may be restricted or delayed. The "Ingress/Egress with Social Vulnerability" tool within the viewer is a critical resource for identifying these high-risk, underserved pockets. Given this context, Park County should continue efforts to identify and support socially vulnerable populations, improve evacuation planning, and enhance public outreach on wildfire preparedness. Leveraging tools like the Colorado Forest Atlas can help the county prioritize mitigation in areas where wildfire hazard and social vulnerability intersect (Figure 12), reducing risks for the most at-risk residents.

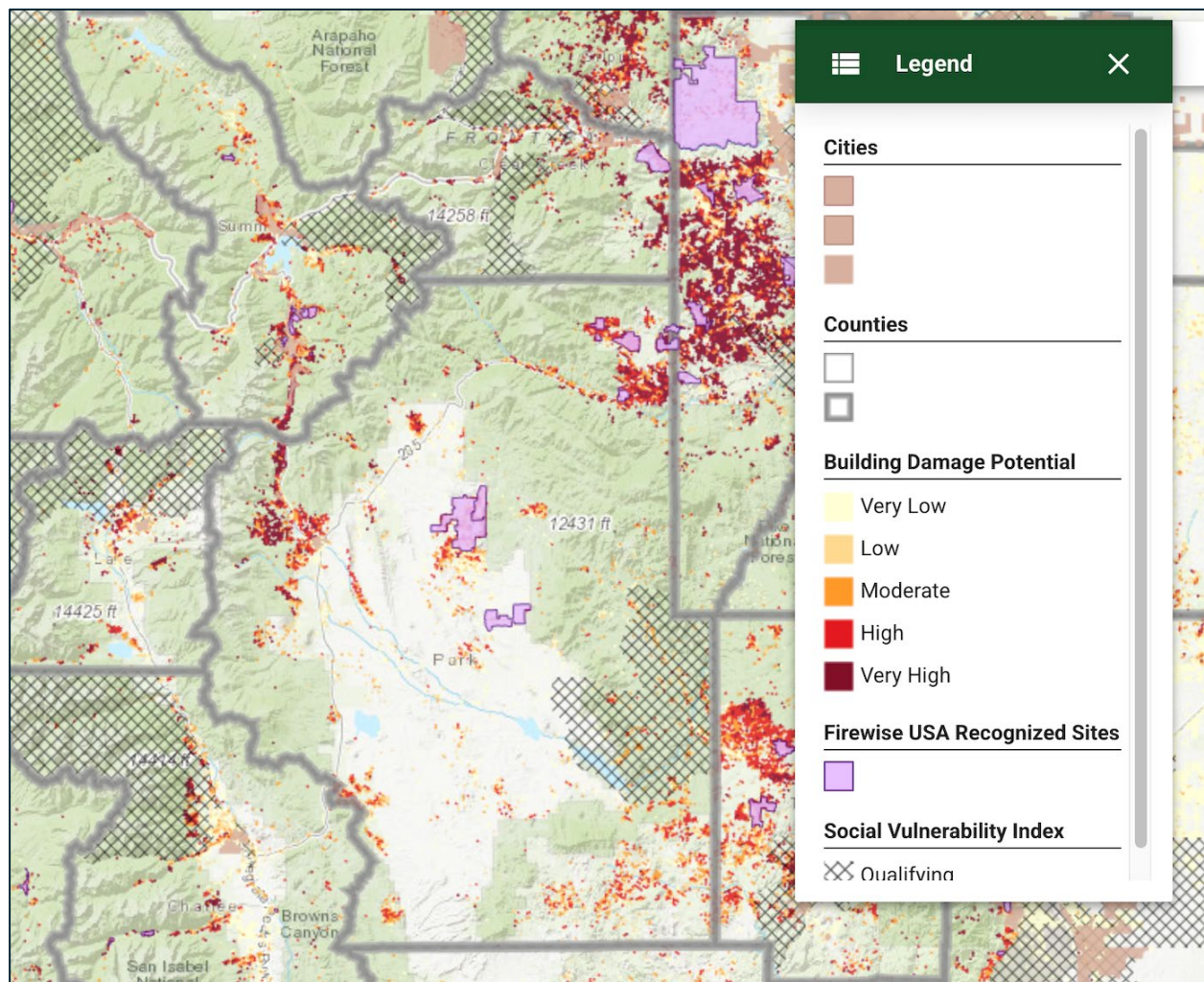


Figure 12. Wildfire Social Vulnerability

While structural loss in terms of homes and commercial buildings has remained relatively limited, with only a few buildings lost or damaged across these incidents, exposure remains high due to the widespread development in Park County's wildland-urban interface (WUI). The Colorado Forest Atlas identifies socially vulnerable WUI clusters in Bailey and Guffey, where limited ingress/egress and economic barriers could delay evacuation. These areas are priorities for community outreach, early warning systems, and defensible space assistance. In addition, several communities, such as those along the Highway 285 corridor and in the Lake George, and Fairplay areas, are especially vulnerable. Wildfires in these regions have repeatedly exposed critical infrastructure, including powerlines, telecommunications towers, and primary ingress/egress routes, demonstrating the need for ongoing investment in hardening infrastructure and enhancing emergency response coordination. Despite limited historical structural loss, Park County's repeated exposure and growing development footprint indicate increasing potential for disruption across multiple FEMA lifelines in future wildfire events.



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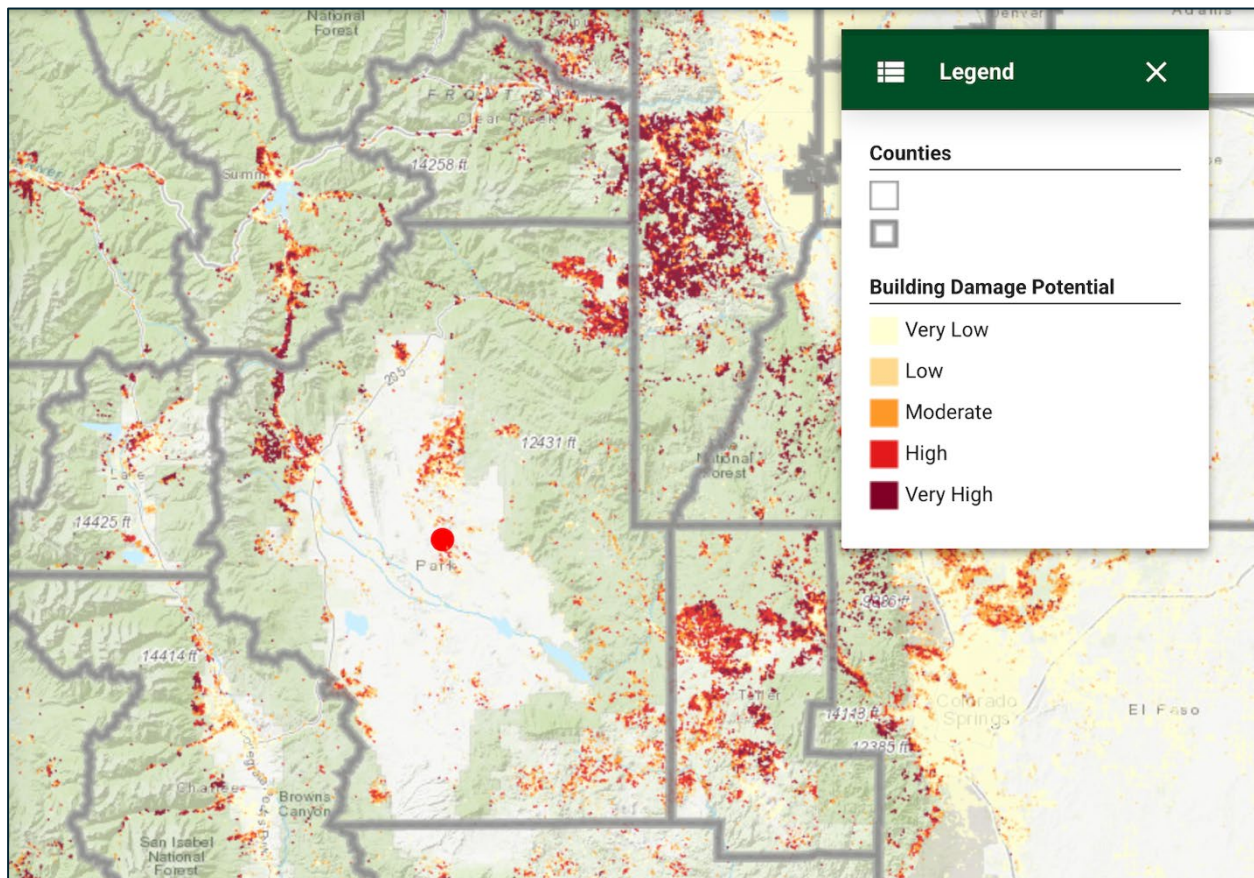


Figure 13. Wildfire Risks with Critical Infrastructure Map

According to the State of Colorado Hazard Mitigation Plan, Park County has between 1,874 and 3,892 buildings exposed to high wildfire risk, placing it in the mid-range for structural exposure statewide. Of these, 792 to 2,414 buildings are specifically located within high-risk Wildland Urban Interface (WUI) areas, where wildfire is most likely to impact human development. In terms of potential economic loss, Park County's total wildfire exposure valuation is estimated between \$173 million and \$548 million, and exposure within high-risk WUI areas alone falls within the \$131 million to \$933 million range. While Park County is not among the highest-tier counties in Colorado for structural or financial exposure, these figures still represent a substantial vulnerability given the county's rural character and widespread development in fire-prone areas. The data underscores the need for continued investment in mitigation planning, especially in WUI zones where homes, infrastructure, and evacuation routes are most at risk.



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Table 20. Critical Facilities in WUI Zones

Facility Type	Example	Exposure / Risk Note
Emergency Services	Fire stations, ambulance posts	May face inaccessibility during fast-moving fires
Utilities	Substations, transmission corridors	Vulnerable to heat and smoke damage
Transportation	Highway 285, County Roads 77 & 90	Key evacuation routes subject to closure
Water Systems	Surface intakes, small rural wells	Post-fire sedimentation risk

Figure 14. Wildfire Exposure Summary

Category	Value/Range	Interpretation
Total Buildings Exposed	1,874 – 3,892	Mid-range exposure statewide; reflects broad vulnerability in wildfire zones.
Buildings in High-Risk WUI Areas	792 – 2,414	Significant concentration of structures in areas where wildfire risk is greatest.
Total Exposure Valuation	\$173 million – \$548 million	Lower-middle tier statewide; indicates meaningful structural value at risk.
High-Risk WUI Exposure Valuation	\$131 million – \$933 million	Not among highest in the state but still substantial economic risk in interface zones.

Lifelines

All community lifelines across the planning area are vulnerable to the impacts from wildfire events. All sectors could be affected, straining resources, and potentially having long-term effects on recovery and resilience.

Interconnected Hazards

In the planning area, wildfire risk is closely interconnected with several other hazards, creating compounding threats. Burn scars from fires such as Weston Pass (2018) and 403 Fire (2023) have increased the potential for post-fire flooding and debris flows along the Tarryall Creek and South Platte tributaries. Hydrophobic soil conditions may exacerbate runoff, creating secondary flood hazards in downstream communities. Wildfires can damage vegetation and destabilize soil, significantly increasing the likelihood of post-fire flooding, debris flows, and landslides, especially during heavy rain events. Additionally, prolonged drought conditions contribute to the buildup of dry fuels, intensifying wildfire behavior. These cascading impacts highlight the importance of considering interconnected hazards in mitigation planning to ensure a comprehensive, resilient response strategy.



Recent and Future Development

Recent and ongoing development in Park County, particularly in forested and mountainous areas, has led to increased expansion into the wildland-urban interface (WUI), where homes and infrastructure are more exposed to wildfire risk. Residential growth near communities such as Bailey, Fairplay, and Lake George has elevated the number of structures located in moderate to high wildfire hazard zones. As the county continues to attract new residents and second-home construction, future development is expected to further encroach into fire-prone landscapes. This trend underscores the need for integrating wildfire mitigation strategies, such as defensible space requirements, fire-resistant building materials, and improved evacuation planning, into land use decisions and building codes to reduce long-term risk.

Changes in Vulnerability

Since the previous HMP update, the planning area's overall vulnerability to wildfire has increased in several key areas. Development within the wildland-urban interface (WUI) has continued, particularly along the Highway 285 corridor, the northern boundary with Summit County, and forested residential areas near Bailey, Lake George, and Fairplay. These expansions have increased the number of structures and residents exposed to high and highest wildfire risk zones.

Weather and environmental conditions have also shifted, contributing to higher potential wildfire intensity. Prolonged drought, rising average temperatures, and persistent beetle kill in lodgepole and ponderosa pine stands have created larger areas of dry, contiguous fuels. The lack of natural low-intensity fire cycles has allowed fuel accumulation, further elevating the risk of severe wildfire events.

Wildfire exposure data from the 2023 Colorado Enhanced State Hazard Mitigation Plan shows Park County now has between 1,874 and 3,892 buildings exposed to high wildfire risk, with 792 to 2,414 structures located specifically in high-risk WUI areas. This reflects a notable increase in development footprint since the last plan cycle. The potential economic loss associated with wildfire has also grown, with total exposure valuation now estimated between \$173 million and \$548 million, and high-risk WUI exposure valuation ranging from \$131 million to \$933 million.

While historical structural loss from wildfires in Park County has remained limited, repeated near-miss events and encroachment of fire perimeters on populated areas demonstrate that the county's susceptibility to disruption across multiple FEMA lifelines, particularly transportation, energy, and communications—has grown. Additionally, increased awareness of post-wildfire hazards such as debris flows, flooding, and landslides highlights expanded secondary vulnerability for communities located downstream of burned areas.

Overall, the combination of expanded development in WUI zones, worsening fuel conditions, and increased economic exposure indicates that Park County's wildfire vulnerability has measurably increased since the last plan update. Since 2016, Colorado has experienced a marked increase in large (>10,000-acre) wildfires, mirroring trends in Park County where ignition frequency and WUI exposure continue to grow.



Consequence Analysis

Table 21. Wildfire Consequence Analysis

Consideration	Description
Public	Wildfires pose a direct threat to life safety through smoke inhalation, burn injuries, or delayed evacuation. Vulnerable populations face heightened risk.
Responders	First responders may face dangerous terrain, limited access, and resource strain during prolonged wildfire events, increasing safety and fatigue concerns.
Continuity of Operations (Government)	Disruption to transportation routes, power, and communications can hinder emergency services, delay response, and impact continuity of local government operations.
Public Confidence in Government	Delayed or poorly coordinated response, inadequate communication, or lack of recovery support can reduce public trust in local and state government institutions.
Property	Homes and outbuildings in the WUI are at high risk of damage or destruction, with losses ranging from minor smoke damage to complete structural loss.
Facilities & Infrastructure	Wildfires can damage or destroy public buildings, roads, utilities (power lines, water systems), and communication infrastructure, leading to long-term service outages.
Environment	Fires damage vegetation, wildlife habitat, and watersheds. Post-fire erosion and sediment runoff degrade water quality and increase downstream flood risks.
Economic	Wildfires disrupt tourism, reduce property values, and increase insurance costs. Recovery costs and business interruption place stress on local economies.

Multi-Jurisdictional Concerns

Wildfire risk in Park County is a shared concern among all participating jurisdictions due to the county's extensive forested lands, dispersed development, and numerous wildland–urban interface (WUI) communities. The Towns of Fairplay and Alma, unincorporated areas of Park County, and the county's fire protection and special districts—including Platte Canyon FPD, Lake George FPD, North-West FPD, Hartsel FPD, Jefferson FPD, and Southern Park County FPD—along with the South Park Ambulance District, all face potential life-safety, property, and infrastructure impacts from wildfire.



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Jurisdictions located along the Highway 285 corridor, in the Bailey area, near Lake George, in and around Jefferson, Hartsel, and Alma, and in the northern forested boundary with Summit County share elevated risk due to concentrated development in dense vegetation and limited evacuation routes. These risks are compounded by overlapping reliance on shared infrastructure such as primary transportation corridors, electric distribution lines, telecommunications towers, and water supply systems.

Because wildfires do not recognize jurisdictional boundaries, a significant incident in one part of the county may rapidly spread across multiple districts, overwhelming local resources and requiring coordinated mutual aid. The county's mountainous terrain and dispersed population also present common operational challenges, including delayed detection, difficult suppression access, and extended travel times for emergency response. Coordinated public education, fuel mitigation projects, infrastructure hardening, and evacuation planning are therefore essential multi-jurisdictional priorities identified for this plan update.

Table 22. Multi-Jurisdictional Hazards Assessment Table

Jurisdiction / Partner	Shared Wildfire Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Extensive WUI areas; post-fire flooding/debris flow risk; large fuel loads	Dispersed housing; limited ingress/egress	Countywide CWPP implementation; evacuation planning
Town of Fairplay	Proximity to forested slopes; smoke impacts	Tourism economy; downtown access routes	Public education; defensible space enforcement
Town of Alma	Surrounded by forested terrain; limited evacuation routes	High elevation weather impacts; seasonal access challenges	Fuel reduction projects; evacuation drills
Platte Canyon FPD	Dense WUI; Highway 285 corridor risk	Single primary evacuation route; overhead powerlines	Vegetation clearance; utility coordination
Lake George FPD	Wildland fuel continuity; post-fire watershed impacts	Water supply intake areas; recreation sites	Watershed protection; community chipping programs
North-West FPD	Interface with Pike National Forest	Remote subdivisions; limited hydrants	Fuel breaks; water tender deployment
South Park Ambulance District	Countywide medical response to wildfire	Long transport times; resource surge during incidents	Mutual aid agreements; responder safety training



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Jurisdiction / Partner	Shared Wildfire Concerns	Notable Vulnerabilities	2025 HMP Priorities
Hartsel FPD	Grassland and shrubland fires; WUI in scattered rural developments	Limited firefighting water supply; long travel distances	Mobile water supply; interagency fire patrols
Jefferson FPD	WUI adjacent to forested slopes; recreational ignition sources	Narrow mountain roads; seasonal tourist influx	Roadside vegetation management; public fire safety campaigns
Southern Park County FPD	WUI with continuous fuels; watershed protection needs	Interface with critical infrastructure; rural subdivision exposure	Fuel break development; evacuation planning

Hazard Summary

Table 23. Hazard Summary Wildfire

Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 15,000 (≈ 85% of total)	≈ 3,000 – 3,800	≈ 50 – 70	\$173 M – \$548 M	High	Extensive WUI across multiple valleys; limited ingress/egress; post-fire debris-flow risk; long response times in rural subdivisions.
Town of Fairplay	≈ 900	≈ 300 – 350	3 – 5	\$20 M – \$25 M	Moderate to High	Surrounded by forested slopes; smoke and evacuation impacts; dependence on Hwy 9 corridor.



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Town of Alma	≈ 325	≈ 150 – 200	1 – 2	\$10 M – \$12 M	High	Steep terrain; limited evacuation access; high-elevation response challenges.
Town of Como / Jefferson Area (JEFF FPD)	≈ 400	≈ 175 – 225	1 – 3	\$10 M – \$15 M	Moderate to High	WUI along Hwy 285; narrow road networks; reliance on volunteer response.
Platte Canyon FPD	≈ 6,000 – 7,000	≈ 1,200 – 1,400	10 – 12	\$90 M – \$130 M	Very High	Densely forested WUI; single-route evacuations; overhead powerlines; priority area per 2020 HMP and CWPP.
Lake George FPD	≈ 2,500	≈ 600 – 700	5 – 7	\$40 M – \$60 M	Very High	Wildland fuels and watershed exposure (Pike NF); tourism and recreation impacts.
Southern Park County FPD (Guffey)	≈ 2,000	≈ 400 – 500	4 – 6	\$25 M – \$35 M	High	Dry conditions; fast-moving grass and shrubland fires; scattered rural housing.



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
North-West FPD	≈ 900	≈ 250 – 300	2 – 3	\$15 M – \$20 M	Moderate	Remote subdivisions; limited water supply; slow response times.
Hartsel FPD	≈ 1,000	≈ 250 – 300	2 – 4	\$20 M – \$25 M	Moderate to High	Grassland and shrubland burns common; long travel distances; water-supply constraints.
South Park Ambulance District	—	Countywide coverage	Countywide	—	—	Provides EMS during wildfire operations; faces surge and access challenges during major events.

Table 24. Quantitative Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Buildings Exposed (all WUI)	1,874–3,892	+15 %
Buildings in High / Highest WUI	792–2,414	+20 %
Population in WUI	99.5 %	+2 %
Total Exposure Valuation	\$173 M – \$548 M	+18 %
Annual Wildfire Probability	100 % (annual potential)	—



Hazard: Severe Winter Storm

Background

With elevations ranging from 7,000 to over 14,000 feet, Park County routinely experiences heavy snow, ice storms, freezing rain, and prolonged cold spells. Blizzards and whiteout conditions frequently impact transportation routes such as US Highway 285, isolating rural communities. Snowpack also plays a dual role, both contributing to spring flood potential and serving as a vital water source for the Front Range. Weather variability may bring more rain-on-snow events and erratic freeze-thaw cycles, increasing hazards like ice accumulation and infrastructure stress. Severe winter weather events can vary in duration and intensity but typically pose significant threats to safety, infrastructure, and daily activities in Park County.

Definition

The planning area hereby adopts the definition as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Location and Extent

Severe winter weather is a countywide hazard in Park County due to its high elevation, mountainous terrain, and rural landscape. Heavy snow, ice, blizzards, and extreme cold regularly impact transportation, utilities, emergency response, and public safety. The Colorado Avalanche Information Center (CAIC) and National Weather Service (NWS) provide tools like the Winter Storm Severity Index (WSSI) to help monitor and anticipate local impacts.

While all participating jurisdictions are vulnerable, higher elevations experience greater snow accumulation and road hazards. Rural and remote communities such as Guffey, Como, and Hartsel face increased risk due to limited access, longer emergency response times, and fewer snow removal resources. In contrast, the South Park Basin sees lower snow accumulation but is prone to high winds and blowing snow, often leading to whiteout conditions and closures along major routes like U.S. Highways 285 and 24. These geographic differences highlight the need for location-specific winter weather mitigation, emergency planning, and public information strategies throughout Park County.

Add Map

Figure 15. Park County Elevation

Park County's high elevation and mountainous terrain make it especially prone to snow, freezing temperatures, and high winds. Ranges like the Mosquito and Front intensify storm systems, leading to heavy snow, drifting, and blizzard conditions.



The rural and dispersed nature of communities adds to the risk, as many areas are accessed by long stretches of highway that can become impassable during storms. Limited road maintenance resources in remote areas often delay snow removal and emergency response. Above ground power lines and limited backup power systems leave many areas vulnerable to outages during ice and snow events, especially in extreme cold. This is a particular concern for residents with limited access to heat or emergency shelters. Winter tourism and recreation also strain local resources; especially along busy mountain passes and travel corridors. These combined factors increase the potential for disruption and emphasize the importance of winter-specific planning, infrastructure resilience, and public preparedness.

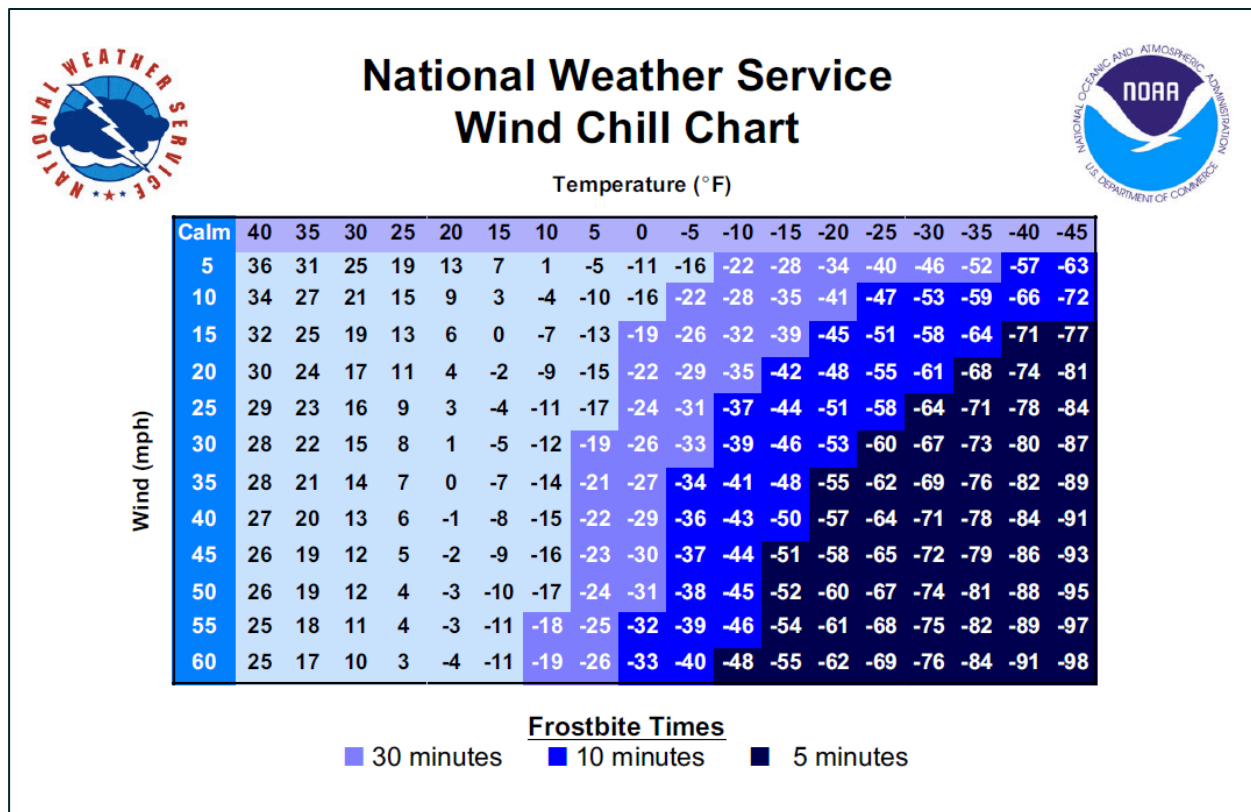


Figure 16. Wind Chill Chart

Critical facilities across the planning area play a vital role in maintaining life safety and essential services during severe winter weather events. Because much of the county's infrastructure is dispersed across mountainous terrain and high-elevation valleys, even moderate snowfall, ice, or high winds can limit access, disrupt utilities, and isolate key facilities. Emergency services, transportation corridors, and utility networks are particularly vulnerable to operational disruptions caused by snow accumulation, ice loading, and prolonged power outages. The table below identifies representative facility types and summarizes their exposure and risk characteristics under severe winter weather conditions.



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Table 25. Critical Facilities in Severe Winter Weather Exposure Zones

Facility Type	Example	Exposure / Risk Note
Emergency Services	Fire stations, ambulance posts, sheriff substations	Snow accumulation and drifting can block access routes; delayed emergency response and staffing shortages during major storms.
Utilities	Power substations, transmission corridors, propane storage, water treatment plants	Ice and high winds can cause downed lines or equipment failure; risk of power outages and disrupted heating during cold snaps.
Transportation	U.S. Highway 285, State Highway 9, County Roads 22, 77, and 90	Frequent closures from heavy snow, ice, and reduced visibility; limits emergency access and regional supply deliveries.
Water Systems	Surface intakes, small rural wells, municipal water towers	Vulnerable to freezing and power-dependent pumps; post-storm sedimentation or pipe ruptures possible.
Communications	Cellular towers, radio repeaters, microwave links	Power loss and ice loading can disable communication systems, hindering coordination and public alerts.
Health and Medical Facilities	Clinics, assisted-living centers, Fairplay Health Services	Limited mobility access during storms; increased patient load for cold-related illness or injury.
Shelters / Critical Care Facilities	Schools, churches, community centers used as warming shelters	May require generator support and snow clearance to maintain safe operation during extended power outages.

Previous Occurrences

Severe winter weather regularly affects Park County, with documented events causing major disruptions. The March 2003 blizzard brought over three feet of snow, closing U.S. Highways 285 and 24, and leading to power outages and supply shortages. In late 2006 and early 2007, back-to-back storms dropped more than 30 inches of snow, resulting in prolonged road closures and emergency declarations. More recent events include a February 2019 storm that brought extreme cold and hazardous travel, leading to school closures, and a March 2021 storm that delivered 1 to 2 feet of snow with wind gusts over 50 mph, creating whiteout conditions and straining emergency services. These recurring events consistently impact transportation, utilities, and vulnerable residents, reinforcing the need for continued winter weather planning and mitigation in the planning area.



Historical Events

Table 26. Historical Severe Winter Weather Events

Type of Event	Area Impacted	Events	Death	Injury	Property Damage	Crop Damage	Prior Reports
Blizzard	Park County	0	0	0	0	0	0
Cold Wind Chill	Park County	1	0	0	0	0	0
Extreme Cold/ Wind Chill	Park County	0	0	0	0	0	0
Frost Freeze	Park County	0	0	0	0	0	0
Heavy Snow	Park County	3	0	0	0	0	0
Ice Storm	Park County	0	0	0	0	0	0
Sleet	Park County	0	0	0	0	0	0
Winter Storm	Park County	73	0	0	0	0	0
Winter Weather	Park County	121	1	0	0	0	0
Total	Park County	198	1	0	0	0	0

Previous Losses

Park County has experienced multiple FEMA-declared disasters tied to severe winter weather. These events have caused significant losses through damage to infrastructure, emergency response costs, livestock deaths, and utility disruptions. While detailed monetary figures vary, cumulative impacts over the past two decades total several million dollars. Particularly costly have been snow removal, emergency shelter operations, and repairs to utility infrastructure.

Notable Events

The December 2006 and January 2007 blizzard series was one of the most impactful events in recent history, causing widespread power outages, transportation closures, and livestock deaths. Emergency services were stretched thin, and mutual aid support was required. Another notable event, the 2021 Winter Storm Uri, impacted power grids across the region. Although the core of the storm hit southern states, ripple effects caused supply chain disruptions and temporary power challenges in Park County.



Table 27. Notable Severe Winter Weather Events

Type of Event	Event Description	Impact Summary
March 2003	Major snowstorm across central Colorado	Over 4 feet of snow, roads closed, communities isolated
Dec 2006–Jan 2007	Consecutive blizzards	State of Emergency declared; livestock losses
February 2019	Heavy snow and whiteout conditions	Power outages; warming shelters opened

Disaster Declarations

To date, no federal major disaster or emergency declaration by FEMA has specifically named Park County for severe winter weather. Examination of the FEMA disaster declarations database shows no records of winter-storm declarations that include Park County. Conversely, at the state and local levels, Park County has issued local emergency declarations during severe blizzard events, since 2006, the County has declared three such emergencies, including the “South Park Drift” event that required regional or state assistance. At the state level, Colorado’s governor verbally declared a statewide disaster emergency for extreme winter weather on November 7, 2024, activating the State Emergency Operations Plan and deploying unarmed National Guard personnel for response efforts.

Probability of Future Occurrences

Severe winter weather will continue to occur in the planning area on an annual basis, consistent with statewide climatological trends for the central and southern Rocky Mountains. The county’s elevation, ranging from 7,000 to over 14,000 feet, and its location on the eastern slope of the Continental Divide make it highly susceptible to heavy snowfall, high winds, ice accumulation, and extreme cold events each winter season. Historical data from the National Weather Service and the National Centers for Environmental Information (NCEI) indicate that Park County experiences multiple winter weather advisories, watches, or warnings every year, with at least one significant storm capable of producing travel disruptions, power outages, and structural stress approximately once every one to two years.

While the severity and duration of winter events vary, weather projections from the Colorado Climate Center suggest an increase in the frequency of freeze-thaw cycles and heavy snow events in high-elevation areas, paired with a possible decline in total annual snowfall due to warming trends. Based on this combination of historical frequency, topographic exposure, and future climate outlooks, the probability of severe winter weather impacting Park County is rated as High (Likely to occur each year), with localized extreme events, such as blizzards or prolonged subzero cold snaps, considered Occasional (return interval of 3–5 years).



Future Costs

The economic impacts of severe winter weather in the planning area are expected to remain significant, with potential increases in long-term costs driven by infrastructure aging, population growth, and continued development in high-elevation and rural areas. While annual snowfall totals may fluctuate, the frequency of extreme cold, ice, and blizzard events is projected to sustain a consistent level of disruption to transportation, utilities, and emergency services. According to state-level modeling from the Future Avoided Cost Explorer (FACE) tool and regional analyses by the Colorado Climate Center, winter weather impacts in mountain counties like Park are expected to cost local economies \$500,000 to \$1 million annually, primarily through road maintenance, power restoration, delayed commerce, and emergency response operations.

Extended or back-to-back winter storms can strain local budgets by increasing overtime labor, fuel and equipment costs, and repair expenditures for damaged utilities and transportation corridors. Secondary impacts, such as roof collapses, traffic accidents, and prolonged heating demands, also contribute to higher long-term costs. As future development continues along the Highway 285 corridor and in outlying communities such as Bailey, Fairplay, and Lake George, exposure of structures and critical infrastructure to severe winter hazards will increase, particularly in areas dependent on a limited number of access routes. Without sustained investment in winter hazard mitigation, such as hardening power infrastructure, maintaining snow removal capacity, and expanding emergency shelter resources—future economic losses and recovery expenditures associated with severe winter weather are expected to rise modestly over the next 10–20 years.

Table 28. Estimated Future Costs Associated with Severe Winter Weather

Impact Category	Estimated Annual Cost Range (\$)	Primary Cost Drivers	Notes / Future Trend
Transportation and Public Works	\$200,000 – \$400,000	Snow removal, de-icing materials, fuel, overtime labor, and road repairs	Costs expected to increase with population growth and aging roadway infrastructure; average of 3–5 major plow events per season.
Utilities and Energy Systems	\$100,000 – \$250,000	Power restoration, pole/line repair, generator fuel, and system hardening	Frequency of ice and wind-related outages projected to remain high; future grid resilience projects may offset costs.
Emergency Services / Response	\$75,000 – \$150,000	Overtime, vehicle maintenance, emergency sheltering, and EMS surge support	Severe storms cause travel delays and extended incident duration; increased demand for warming shelters.



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Impact Category	Estimated Annual Cost Range (\$)	Primary Cost Drivers	Notes / Future Trend
Private Property and Structural Damage	\$50,000 – \$100,000	Roof failures, frozen pipes, snow-load damage, and insurance claims	Historically low but rising with new residential development in exposed mountain zones.
Economic Disruption and Lost Productivity	\$50,000 – \$125,000	Business closures, delayed freight, and workforce absenteeism	County's commuter workforce and tourism-based economy vulnerable to multi-day road closures.
Total Estimated Annual Economic Impact	\$475,000 – \$1,025,000	—	Represents cumulative annualized costs; consistent with FACE model estimates for Colorado mountain counties.

Source: Park County Emergency Operations Plan (2024); Colorado Climate Center; Future Avoided Cost Explorer (FACE) Tool; Colorado DHSEM Hazard Mitigation Data Portal (2023).

Risk and Vulnerability

Severe winter weather affects the entire planning area, but risk and vulnerability vary by location and population. Key risks include road closures, power outages, limited emergency access, and threats to life safety, especially for elderly residents, medically dependent individuals, and those in remote or poorly insulated homes.

Mountain passes and major highways like U.S. 285 and 24 are prone to closures during storms, isolating communities and delaying emergency services. Rural areas with limited snow removal resources face extended access issues. Ice and wind can damage above-ground power lines, leading to prolonged outages.

Vulnerable populations without backup heat or transportation may be unable to safely shelter or seek assistance during extreme cold. Critical facilities like schools, fire stations, and healthcare centers depend on road access and reliable utilities to maintain operations during winter events.

Although winter weather affects the entire county, higher elevations and resource-limited areas face greater risk, underscoring the need for focused preparedness, infrastructure improvements, and public outreach to reduce vulnerability.



Population at Risk

- Elderly, disabled, and low-income residents are at higher risk due to limited mobility, heating access, or shelter resources.
- Residents in mobile homes or substandard housing are more susceptible to cold exposure and infrastructure failure.
- Tourists and travelers may become stranded during sudden snowstorms, especially in remote areas.

Impacted Areas

The entire county is subject to winter weather, but certain areas face heightened vulnerability:

- Highway corridors such as U.S. 285, CO 9, and U.S. 24 often experience closures due to snow and ice.
- Remote residential subdivisions such as Indian Mountain and Ranch of the Rockies may face delayed access to emergency services.
- High-elevation towns like Fairplay and Alma are exposed to prolonged and intense snow accumulation.

Community Vulnerability

Park County has limited medical and emergency response infrastructure. Only a few fire stations and clinics serve the county, which can lead to delays during major storms. Many communities rely on electricity for heating, and backup power options are limited. In the event of widespread outages, warming shelters may be needed, but few dedicated facilities exist for large-scale sheltering.

The planning area's residents, infrastructure, and critical facilities are widely exposed to severe winter weather hazards. Key transportation routes like U.S. Highways 285 and 24, along with mountain passes such as Kenosha and Wilkerson, frequently face snow and ice-related closures and accidents. Above-ground power and communication lines are vulnerable to ice and wind damage, risking outages and disruptions. Water systems, especially those with exposed pipes or pumps, are also at risk from freezing temperatures. Critical facilities are exposed to operational challenges from winter weather impacts, including access issues and utility interruptions. Seasonal tourism further increases exposure to major travel corridors during winter months. This broad exposure underscores the need for continued planning and infrastructure resilience throughout the planning area.



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Table 29. Severe Winter Weather Exposure Summary

Category	Value / Range	Interpretation
Total Buildings Exposed	5,200 – 5,800	Nearly all structures in Park County are exposed to winter weather impacts such as heavy snow, ice accumulation, and extreme cold. Exposure is countywide, including both incorporated towns and rural communities.
Critical Facilities Exposed	95 – 120	All emergency services, utilities, and transportation facilities are susceptible to operational disruption or access limitations during severe winter events. Backup power and snow-removal capability are key mitigation factors.
Population Exposed	≈ 17,700 (100% of residents)	All residents experience winter storm effects annually. Vulnerability increases in isolated subdivisions and mountain passes where extended road closures or power outages are possible.
Total Exposure Valuation	\$850 million – \$1.1 billion	Reflects the combined value of public and private structures at risk from snow load damage, freezing, and prolonged utility interruption.
Transportation Network Exposure	≈ 500 mi of county and state roads	Snow, ice, and wind exposure affects the entire roadway system, including U.S. 285, State 9, and county access roads. Closures can isolate communities for multiple days.
Economic Exposure	\$5 – \$10 million per event (average)	Includes costs from response operations, business interruption, infrastructure repair, and lost tourism revenue during major winter storm events.
Overall Risk Level	High	Park County's elevation (7,000–10,000 ft) and topography result in frequent heavy snow and cold-weather events. Annual recurrence and potential isolation elevate overall countywide risk.

Lifelines

All community lifelines in the planning area are susceptible to disruption from severe winter weather events, particularly blizzards, ice storms, and prolonged cold snaps. The Transportation lifeline is the most frequently impacted, as heavy snowfall and ice accumulation often close U.S. Highway 285, State Highway 9, and other key corridors that connect residents to emergency services, fuel supplies, and commerce centers. The Energy lifeline is also vulnerable, with high winds and ice capable of downing powerlines and disrupting heating services, posing life-safety risks for residents in remote mountain communities. The Communications lifeline can be temporarily disabled when power outages affect cellular towers and radio systems, hindering public warning and coordination among first responders.



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Severe storms can further strain the Health and Medical lifeline by isolating residents from emergency care and increasing incidents of hypothermia, carbon monoxide exposure, and vehicle-related injuries. The Food, Water, and Shelter lifeline is periodically challenged when road closures delay supply chains and limit access to grocery, propane, and medical deliveries. Finally, impacts to the Safety and Security and Hazardous Materials lifelines may arise during extended events, when limited mobility constrains law enforcement patrols and emergency response. Because of Park County's high elevation, dispersed population, and dependence on a few critical corridors, winter weather events can degrade multiple lifelines simultaneously underscoring the importance of pre-storm coordination, redundant communications, and infrastructure hardening to maintain essential services during extended outages.

Table 30. Lifeline Impacts

Lifeline Category	Risk Description
Energy	Electric grid failure, fuel delivery disruption
Transportation	Road closures, isolation of remote communities
Communications	Power-dependent systems fail; cell coverage spotty
Health & Medical	Delayed EMS, cold injuries, limited shelter capacity
Food/Water/Shelter	Need for warming centers; supply chain interruptions
Safety & Security	Response delays and increased structure fire risk

Interconnected Hazards

Severe winter weather in the planning area often triggers related hazards that increase overall impacts. Snow, ice, and freezing temperatures frequently cause power outages that disrupt heating, communication, and water systems. Road closures and hazardous conditions lead to accidents, stranded motorists, and delayed emergency responses, especially on mountain passes and rural highways. Extreme cold raises public health risks like hypothermia and carbon monoxide poisoning, particularly for vulnerable groups. Heavy snow can cause structural damage, including roof collapses and burst pipes. Additionally, rapid thawing after storms can lead to flooding and erosion. Recognizing these interconnected hazards is essential for effective, comprehensive mitigation and emergency planning in the county.

Recent and Future Development

Recent growth in Park County has expanded into higher-elevation and wildland-urban interface areas, increasing exposure to severe winter storms and complicating access during emergencies. Development along major routes like U.S. Highways 285 and 24 has raised traffic and pressure on snow removal and emergency services. While infrastructure improvements have enhanced winter storm response, aging above-ground power lines remain vulnerable to damage and outages.



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Future population and development growth in rural and mountainous areas will likely increase demands on winter maintenance and emergency resources. Combined with projected weather change impacts leading to more intense and variable storms, this growth underscores the need for resilient infrastructure, adaptive land use planning, and strong community preparedness to reduce winter weather risks.

Changes in Vulnerability

Since the previous Hazard Mitigation Plan update, Park County's vulnerability to severe winter weather has increased moderately, primarily due to population growth in high-elevation communities, expanding development along key transportation corridors, and aging infrastructure systems. Residential growth in Fairplay, Bailey, and Lake George has increased the number of households dependent on a limited number of access routes that are prone to closure during heavy snowfall and icy conditions. The County's road network—largely consisting of two-lane highways and rural gravel roads remains highly sensitive to snow accumulation and drifting, which can isolate neighborhoods for extended periods.

In addition, aging utility infrastructure increases exposure to power outages caused by ice, snow load, and wind damage, particularly in remote areas with limited redundancy in power distribution. The growing reliance on home heating systems powered by electricity or delivered propane creates additional risk for households during prolonged outages or blocked deliveries. Social vulnerability has also become a more prominent concern: elderly residents, individuals with mobility limitations, and low-income households are more susceptible to cold-related illness and face challenges securing alternative heating or transportation during severe storms.

Although road maintenance capabilities and public notification systems have improved since the last plan cycle—reducing short-term impacts from minor events, the combined effects of development pressure, infrastructure aging, and demographic shifts have increased the planning area's overall exposure to severe winter weather hazards. These changes underscore the need for continued investment in snow removal capacity, power system hardening, and expansion of emergency shelter and warming center resources to reduce vulnerability in future events.

Consequence Analysis

Severe winter weather in the planning area leads to transportation disruptions, road closures, and hazardous conditions that delay emergency response and increase accident risks. Power outages from ice and wind damage leave residents, especially vulnerable populations, without heat, water, and communications for extended periods. Heavy snow and frozen pipes cause structural damage to homes, businesses, and critical facilities, while utility and transportation disruptions impact schools, healthcare, and local economies. These combined effects can strain emergency resources, particularly during prolonged or repeated storms, and worsen social isolation and mental health challenges. Recognizing these consequences helps focus mitigation on infrastructure resilience, emergency preparedness, and community support to reduce winter weather impacts countywide.



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Table 31. Severe Winter Weather Consequence Analysis

Consideration	Description
Public	Severe winter weather poses risks to life safety through exposure, hypothermia, vehicle accidents, and isolation during prolonged snow or ice events. Vulnerable populations such as the elderly, low-income residents, and those without reliable heating or transportation face heightened risk.
Responders	First responders face hazardous driving conditions, limited mobility, and prolonged response times during blizzards or icy conditions. Extended cold events can also lead to equipment failure, fatigue, and safety concerns for personnel operating in extreme conditions.
Continuity of Operations (Government)	Snow and ice accumulation can close offices, disrupt communications, and delay essential government functions. Extended power outages or impassable roads can affect continuity of government operations and hinder coordination among departments.
Public Confidence in Government	Delayed snow removal, inadequate communication of road closures, or insufficient sheltering resources can erode public confidence in local and state response capabilities. Timely messaging and visible action are essential for maintaining trust.
Property	Heavy snow, ice, and wind can damage roofs, gutters, and siding; frozen pipes can burst, causing interior flooding. Mobile homes, older structures, and flat-roofed buildings are especially vulnerable.
Facilities & Infrastructure	Power lines, water systems, and communication networks are highly susceptible to damage from ice and wind. Prolonged outages can disrupt heating, water service, and emergency communication systems across multiple jurisdictions.
Environment	Winter storms can stress wildlife and livestock populations, contaminate water sources through roadway salt runoff, and accelerate erosion during spring melt. Ice accumulation can also damage vegetation and trees, creating secondary debris hazards.
Economic	Severe storms cause loss of business revenue, increased road maintenance and utility repair costs, and higher heating expenditures. Prolonged closures of major corridors such as U.S. Highway 285 can disrupt regional tourism and commuting patterns.



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Multi- Jurisdictional Hazards

Table 32. Multi-Jurisdictional Hazard Table

Jurisdiction / Partner	Shared Severe Winter Weather Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide snow accumulation, high-wind blizzards, and prolonged cold spells disrupting roads and utilities	Aging road and power infrastructure; limited snow-removal equipment in remote areas	Maintain countywide snow-removal capacity; expand fuel and equipment reserves; enhance coordination with CDOT and power providers
Town of Fairplay	Frequent snow, ice, and wind events; impacts to downtown access and tourism corridors	Congested intersections, limited parking and plowing space; pedestrian safety concerns	Improve snow-removal routes; enhance sidewalk maintenance and public alerting systems; maintain emergency warming shelter capacity
Town of Alma	Heavy snow and prolonged subzero temperatures; avalanche risk on adjacent slopes	Limited road access (one primary route); frequent icing on mountain roads	Coordinate with CDOT for snow removal and avalanche mitigation; ensure backup power for municipal facilities
Platte Canyon Fire Protection District	Winter road closures affecting response; power outages impacting station operations	Narrow canyons, steep terrain, and limited turnaround space for apparatus	Develop alternate response routes; increase access to portable generators and heating equipment
Lake George Fire Protection District	Severe snow and freezing conditions restricting access to Pike National Forest areas	Rural road isolation and limited hydrant access	Maintain regional mutual aid for road clearance and transport; identify static water sources for fire and EMS use
North-West Fire Protection District	Snow-covered terrain hindering fire and EMS access to remote properties	Prolonged response times due to heavy snow; volunteer availability challenges	Increase four-wheel-drive and tracked vehicle capability; coordinate shelter operations for responders
Hartsel Fire Protection District	Whiteout conditions and drifting snow across open terrain	Long transport distances and limited resources	Pre-position resources before forecasted storms; improve coordination for life-safety checks on isolated residents



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Jurisdiction / Partner	Shared Severe Winter Weather Concerns	Notable Vulnerabilities	2025 HMP Priorities
Jefferson Fire Protection District	Snow and ice accumulation along Highway 285 corridor; communication impacts	Mountainous terrain and limited radio coverage	Implement redundant communications and enhance fuel storage for extended operations
Southern Park County Fire Protection District	Power outages, freezing rain, and heavy snow at high elevations	Extended road closures and limited utility redundancy	Harden critical infrastructure; expand collaboration with local road crews for snow clearance
South Park Ambulance District	Countywide patient transport delays and increased medical demand during storms	Limited ambulances available; long distances to hospitals	Maintain snow-capable EMS vehicles; expand regional coordination for patient transfers
Colorado Department of Transportation (CDOT)	Maintains critical lifelines (U.S. 285, SH 9, SH 77)	Heavy snow and drifting impacting highway safety	Continue interagency coordination on plow priorities, traveler information systems, and resource staging

Hazard Summary

Based on frequency, geographic extent, and potential consequences, Severe Winter Weather is ranked as a high-priority hazard for the planning area. Its regular occurrence, widespread exposure, and potential to compound other hazards like power loss and transportation accidents make it a critical focus of mitigation planning.

Table 33. Hazard Summary – Severe Winter Weather

Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 15,000 (≈ 85 % of total)	≈ 5,000 – 5,500	≈ 80 – 100	\$300 M – \$600 M	High	Countywide exposure to snow, ice, and high winds; numerous rural roads subject to closure;



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						prolonged power outages possible; limited snow removal capacity in remote areas.
Town of Fairplay	≈ 900	≈ 400 – 450	5 – 6	\$35 M – \$40 M	Moderate to High	Frequent snowfall and wind events; limited parking and downtown plow space; dependence on Highway 9 corridor for access and supply routes.
Town of Alma	≈ 325	≈ 150 – 200	2 – 3	\$12 M – \$15 M	High	Highest-elevation community in the county; avalanche risk on adjacent slopes; single-route access creates potential isolation during blizzards.
Town of Como / Jefferson Area (JEFF FPD)	≈ 400	≈ 200 – 250	2 – 3	\$15 M – \$18 M	Moderate to High	Strong winds and blowing snow create whiteouts along Hwy 285; rural roads lack regular maintenance and de-icing.



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Platte Canyon FPD	≈ 6,000 – 7,000	≈ 1,400 – 1,600	10 – 12	\$100 M – \$140 M	Very High	Steep terrain and canyon winds create dangerous drifts and ice; frequent power and communications disruptions; critical corridor for evacuation and supply.
Lake George FPD	≈ 2,500	≈ 600 – 700	5 – 7	\$45 M – \$65 M	High	Susceptible to freezing rain and snow accumulation near recreation sites and watersheds; utility and road closures common.
Southern Park County FPD (Guffey)	≈ 2,000	≈ 400 – 500	4 – 6	\$30 M – \$40 M	High	Strong winds and low temperatures produce frequent whiteouts; limited backup power options for critical facilities.
North-West FPD	≈ 900	≈ 250 – 300	2 – 3	\$18 M – \$22 M	Moderate	Remote subdivisions and steep roads are difficult to keep clear; isolation risk for residents and



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						first responders.
Hartsel FPD	≈ 1,000	≈ 250 – 300	2 – 4	\$22 M – \$26 M	Moderate to High	Open terrain and high winds create snowdrift hazards; long travel distances delay response.
South Park Ambulance District	—	Countywide coverage	Countywide	—	—	Provides EMS and patient transport during severe storms; faces delays due to road closures and limited vehicle mobility in snow and ice conditions.

Table 34. Quantitative Risk Summary – Severe Winter Weather

Exposure Metric	2025 Estimate	Change Since 2020
Buildings Exposed to Snow / Ice Hazards	≈ 5,500 – 6,000	+10 %
Population Regularly Impacted by Winter Storms	≈ 17,500 (≈ 100 % of county)	Stable (± 2 %)
Critical Facilities with Winter Access Constraints	≈ 100 – 120	+5 %
Estimated Total Exposure Valuation	\$300 M – \$650 M	+12 %
Annual Probability of Severe Winter Event	100 % (occurs each year)	—



Hazard: Flood (Flash & Riverine)

Background

Though generally arid, the planning area is vulnerable to both flash flooding and riverine flooding, particularly in low-lying areas near the South Platte River, Tarryall Creek, and the Middle Fork. Fast-moving thunderstorms over steep terrain can generate significant runoff, overwhelming culverts and damaging roads. Historic flooding in Alma and Fairplay underscores the need for proactive mitigation, especially in areas with aging or undersized drainage infrastructure. Spring snowmelt and rain-on-snow events are becoming more unpredictable due to weather changes.

Definition

The planning area hereby adopts the definition as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Location and Extent

Flooding in the planning area can occur throughout the county but is most likely in areas adjacent to rivers, creeks, and low-lying terrain. The most flood-prone areas are concentrated along the South Platte River, including its Middle Fork and South Fork, which flow through the central and northern portions of the county. Other significant waterways include Tarryall Creek, Fourmile Creek, and numerous seasonal drainages that become active during snowmelt or heavy rain events. Communities such as Bailey, Fairplay, Alma, Hartsel, and rural subdivisions like Ranch of the Rockies and Indian Mountain are located near flood-prone channels and may be affected by either flash or riverine flooding. Areas downstream of steep slopes, especially those near recent wildfire burn scars, are particularly vulnerable to flash flooding and debris flows.

In addition, smaller tributaries and ephemeral streams that are typically dry for much of the year can quickly become hazardous during high-intensity thunderstorms, particularly in summer. While formal FEMA floodplain mapping is limited in rural parts of the county, many roads, culverts, and driveways are known to be repeatedly impacted by localized flooding, even outside designated flood zones. Therefore, flood risk is widely distributed and often underrepresented in mapped hazard areas.



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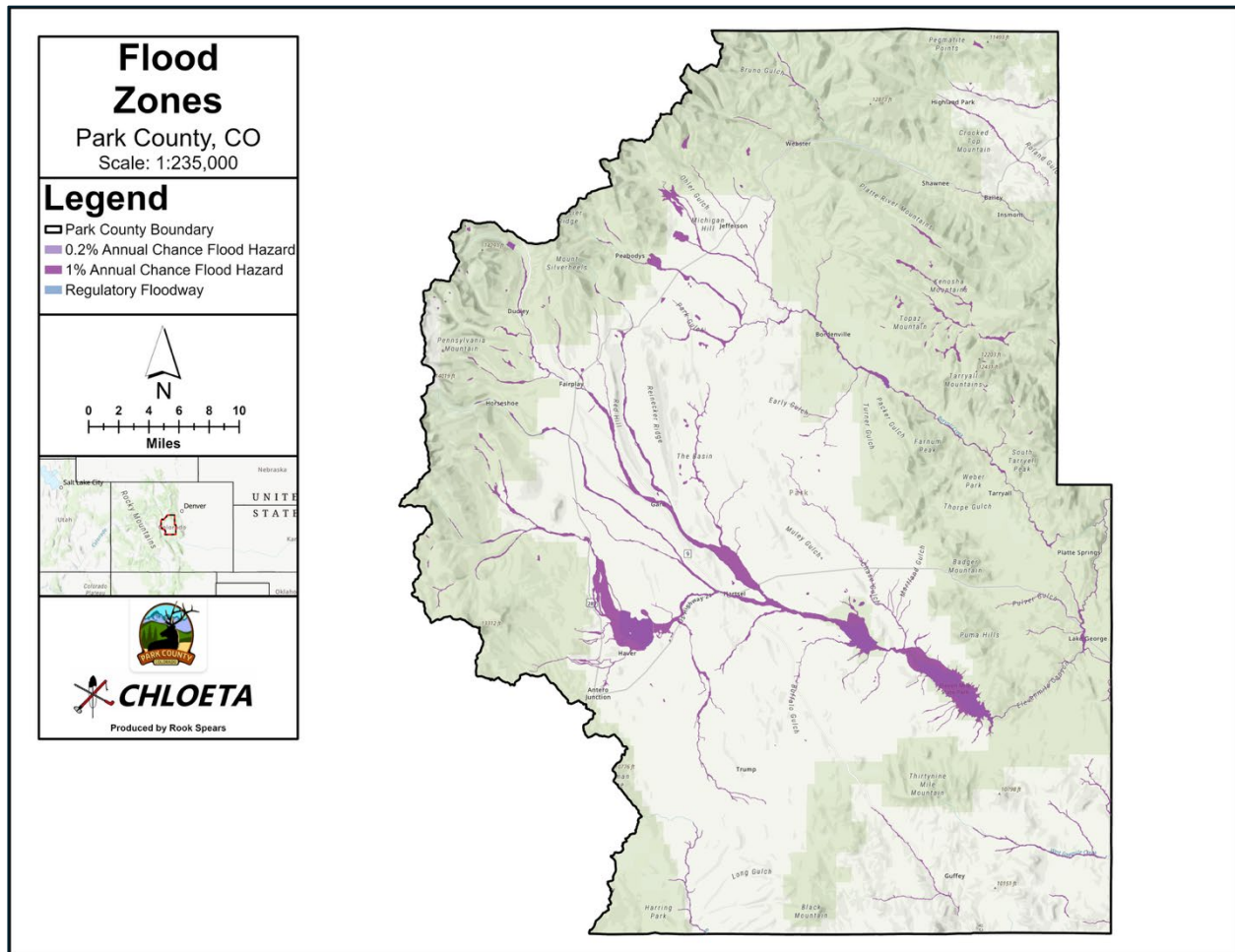


Figure 17. Park County FEMA Flood Insurance Rate Map (FIRM)

The planning area experiences both flash flooding and riverine flooding, often driven by intense rainfall, rapid snowmelt, or ice/sediment blockages in mountain streams. The county's steep topography and narrow valleys accelerate water runoff, while limited soil permeability and sparse vegetation in some areas exacerbate flash flood risk. Riverine flooding primarily occurs along the South Platte River, Middle Fork and South Fork of the South Platte, and Tarryall Creek, especially following sustained precipitation or spring melt. Burn scars from wildfires can also significantly increase flood risk by reducing ground absorption.

Figure 18. Park County FEMA Flood Insurance Rate Map (FIRM) with CIKR (Critical Infrastructure)

[FIRM Zones with Critical Infrastructure Locations]



Previous Occurrences

Flooding events are less frequent than winter storms but can be highly destructive and unpredictable. Flash floods can develop rapidly with little warning, especially in high-elevation areas and narrow canyons.

Historical Events

Localized flood events also occur annually along creek systems and drainageways, especially during the spring runoff season.

Table 35. Flooding Historical Events

Type of Event	Area Impacted	Events	Death	Injury	Property Damage	Crop Damage	Prior Reports
Flash Flood	Park County	9	0	0	\$16,000	\$5,000	0
Flood	Park County	1	0	0	\$15,000	\$10,000	0
Total	Park County	10	1	0	\$31,000	\$15,000	0

Previous Losses

Although large-scale, damaging floods are rare, Park County has incurred tens of thousands in public infrastructure damage during multiple events. Road washouts, culvert failures, and debris clean-up often follow intense rainfall or snowmelt. Smaller floods have affected rural bridges, ranch lands, and private roads, particularly in eastern and southern Park County. Limited federal disaster declarations have been issued, but most flood losses have been addressed at the local or state level.

Notable Events

The 2013 Front Range Floods impacted Eastern Park County despite the county being west of the flood epicenter. Heavy rains saturated soils caused culvert failures, and damaged secondary roads. In 2021, a flash flood triggered debris flows on a recent wildfire burn scar, highlighting the increasing severity of post-fire flood events. Additionally, recurring localized floods in the Tarryall area have damaged ranch fencing, roads, and private culverts.



Table 36. Notable Flood/Flooding Events

Type of Event	Event Description	Impact Summary
July 1997	Flash flooding following thunderstorms	Road damage near Bailey; localized evacuations
September 2013	Historic Front Range floods reached Park County	Saturated soils; road washouts in eastern portions
July 2021	Flash flood on burn scar from 2020 wildfire	Debris flow; temporary road closures and culvert failure

Extreme Flood Events

Though rare, extreme flood events could occur due to dam failure, extreme precipitation, or rain-on-snow events. Park County has several small dams and reservoirs, and while none are classified as high hazard, an upstream breach could trigger downstream flooding, especially in narrow valleys with limited evacuation routes. Flash floods pose the greatest life safety risk due to their unpredictability and speed.

Disaster Declarations

Park County has experienced multiple flood-related emergency declarations over the past several decades, though only a limited number have resulted in federal disaster assistance. According to the Federal Emergency Management Agency (FEMA) Disaster Declarations Summary and state records maintained by the Colorado Division of Homeland Security and Emergency Management (DHSEM), Park County has been included in several statewide or regional flood events. Notable declarations include FEMA DR-4229 (2015), issued for spring flooding and severe storms across central Colorado, and FEMA DR-4145 (2013), which covered widespread flash flooding across the Front Range and adjacent mountain counties. While the heaviest damage in 2013 occurred in Boulder and Larimer Counties, Park County experienced localized road washouts, culvert failures, and debris flows in alpine drainage areas. Earlier, FEMA DR-1283 (1999) addressed flooding and heavy rain impacts that affected portions of the South Platte River Basin, including Park County's northern drainage systems.

In addition to federal declarations, Park County has issued local disaster declarations for flash flooding and debris flow events, particularly following intense summer thunderstorms in burn-scar areas and along narrow mountain canyons. The most frequent impacts involve road closures, erosion damage to rural infrastructure, and temporary isolation of small communities. While no fatalities have been reported from recent flood events, recurring washouts along County Roads 22, 77, and 90 and within the Tarryall Creek and Fourmile Creek watersheds have required repeated state-level repair and mitigation assistance. These declarations underscore the continuing vulnerability of Park County's transportation network and drainage systems to short-duration, high-intensity flood events that follow wildfire or monsoonal precipitation patterns.



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Table 37. Flood-Related Disaster Declarations – Park County

Disaster Number / Type	Year	Declaration Type	Event Description	Areas / Jurisdictions Affected	Impacts / Notes
FEMA DR-4229-CO	2015	Major Disaster (Federal)	Severe storms, flooding, landslides	Park County (included among declared counties)	Heavy rain and snowmelt caused localized flooding and minor road washouts in rural drainage areas.
FEMA DR-4145-CO	2013	Major Disaster (Federal)	Severe storms, flooding, and landslides (Front Range Floods)	Multiple central counties including Park	Regionwide flash flooding; debris flows and culvert damage near Tarryall Creek and North Fork South Platte River.
FEMA DR-1283-CO	1999	Major Disaster (Federal)	Severe storms and flooding	Park County (South Platte River Basin)	Flooding and road erosion along northern drainages; minor structural impacts.
FEMA DR-977-CO	1992	Major Disaster (Federal)	Heavy rain and flooding	Central mountain counties	Localized flooding in alpine zones; rural infrastructure impacts.
Local Declaration – Tarryall Creek Flooding	2018	Local Disaster Declaration	Flash flooding and debris flow following intense thunderstorm	Park County OEM / Public Works	Local road closures, culvert washouts, and debris removal required state assistance.
Local Declaration – Fourmile Creek / CR 77 Flooding	2021	Local Disaster Declaration	Monsoonal rain and post-fire debris flow	Southern and eastern Park County	Temporary bridge and road closures; public works emergency repairs; coordination with DHSEM.

Source: FEMA Disaster Declarations Summary (1953–2025); Colorado DHSEM Disaster Declarations Database.

Probability of Future Occurrence

Flooding remains a recurring and likely hazard in the planning area, driven by a combination of seasonal precipitation patterns, snowmelt, steep topography, and post-wildfire watershed conditions. Based on historical records from the National Centers for Environmental Information (NCEI), FEMA Disaster Declarations, and Colorado DHSEM reports, the county experiences flood- or flash-flood-producing storms nearly every year, with localized damaging events occurring approximately once every three to five years.



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The most flood-prone areas include the Tarryall Creek, Fourmile Creek, Trout Creek, and South Platte River drainages, where steep terrain and shallow soils contribute to rapid runoff and debris flow potential.

While large-scale riverine flooding is less frequent due to the county's high elevation and relatively narrow valleys, flash flooding and post-fire debris flows have become more common since 2018, following major wildfires in adjacent watersheds. Climate modeling by the Colorado Climate Center indicates that the frequency of short-duration, high-intensity rainfall events, particularly during late-summer monsoonal periods, is expected to increase modestly over the next several decades, sustaining a high probability of localized flooding across the county.

Considering historical frequency, terrain, and evolving precipitation trends, the probability of future flood events in the planning area is rated as High, with minor nuisance flooding expected annually and moderate to major events likely to occur every 3–5 years.

Future Costs

Future flood-related costs in the planning area are expected to increase modestly over the next two decades, primarily due to expanding residential development in flood-prone valleys, aging transportation infrastructure, and more frequent high-intensity precipitation events. Although widespread riverine flooding remains uncommon, localized flash floods and post-fire debris flows are likely to produce recurring damage to roads, culverts, and drainage structures. According to the Future Avoided Cost Explorer (FACE) tool and Colorado Climate Center projections, the county's annualized flood-related damages are estimated to average between \$500,000 and \$1.5 million per year under current conditions, reflecting road washouts, culvert replacements, erosion repairs, and emergency response costs.

Under future population growth and climate change scenarios, projected damages could rise to \$1.8 million to \$2.2 million annually by 2050, with infrastructure representing more than 70% of total losses. The transportation and public works sectors are expected to bear the largest share of future costs, followed by residential property and utility infrastructure. Secondary costs include emergency road maintenance, debris removal, and temporary access restoration to isolated communities following flash flooding or debris flow events.

Without sustained investment in flood mitigation, such as culvert upsizing, channel stabilization, stormwater infrastructure upgrades, and post-fire watershed treatments, the long-term financial burden on county and local governments will continue to rise. Proactive implementation of these measures could reduce cumulative future losses by up to 30–40%, according to FACE tool modeling for comparable Colorado mountain counties.



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Table 38. Estimated Future Costs Associated with Flooding – Park County, Colorado

Impact Category	Estimated Annual Cost Range (\$)	Primary Cost Drivers	Notes / Future Trend
Transportation and Public Works	\$300,000 – \$900,000	Road and culvert washouts, bridge erosion, debris removal, and emergency grading	Expected to rise as more roads age beyond design life; post-fire runoff and intense rainstorms accelerate degradation.
Utilities and Infrastructure	\$100,000 – \$300,000	Waterline and sewer infiltration, substation floodproofing, and storm-drain failure	Increased risk where utilities intersect stream corridors; projected to rise with system aging and network expansion.
Private Property and Structures	\$75,000 – \$250,000	Basement flooding, foundation erosion, and content losses	Minor in scope but recurring in flood-prone subdivisions; mitigation retrofits can substantially reduce losses.
Emergency Response and Recovery	\$50,000 – \$150,000	Road closures, debris management, overtime labor, and temporary sheltering	Likely to remain steady, though response costs surge after multi-day or regional events.
Agriculture and Natural Resources	\$25,000 – \$100,000	Crop and pasture damage, livestock loss, and soil erosion	Localized to South Park Basin and Tarryall Creek areas; intensified by post-fire runoff and drought-to-flood cycles.
Total Estimated Annual Economic Impact	\$550,000 – \$1,700,000	—	Reflects cumulative countywide exposure under current and moderate growth scenarios.

Source: FEMA Disaster Declarations Summary (1953–2025); Colorado DHSEM Hazard Data Portal; Future Avoided Cost Explorer (FACE) Tool (2024); Park County OEM and Public Works Department.

Risk and Vulnerability

Flooding in the planning area presents a complex and evolving risk profile influenced by topography, land use, soil conditions, and post-wildfire watershed instability. The county's mountainous terrain, narrow valleys, and shallow drainage basins make it highly susceptible to flash flooding, debris flows, and localized erosion, particularly following high-intensity rainfall events.



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Communities located near Tarryall Creek, Fourmile Creek, Trout Creek, and the South Platte River headwaters face recurring flood exposure, as do transportation corridors such as U.S. Highway 285 and County Roads 22, 77, and 90, where culvert capacity and aging drainage systems contribute to repeated closures and damage.

A majority of the planning area's developed areas, including Fairplay, Alma, Jefferson, and Bailey, are situated within or adjacent to high-gradient stream valleys, where concentrated runoff can produce rapid inundation with little warning. Structures located near these corridors are at risk of foundation undermining, sediment deposition, and roadbed washouts, while residents may experience isolation when access routes are cut off. Post-fire environments further compound flood vulnerability, as burn scars and hydrophobic soils dramatically increase runoff potential and debris flow hazards during even moderate rainfall.

Critical infrastructure such as bridges, culverts, water systems, and emergency response routes, faces the greatest physical exposure, with estimated replacement values for at-risk assets exceeding \$200 million countywide. While floodplain development remains limited compared to Front Range counties, rural growth in unincorporated valleys and aging stormwater infrastructure in older town centers have expanded exposure since the previous plan update. Social vulnerability factors, including isolated elderly populations, residents lacking reliable vehicles, and households in remote mountain subdivisions, increase the potential for delayed evacuation or assistance during major flood events. Overall, the planning area's flood vulnerability is classified as High, with widespread but variable exposure. The most significant risks involve transportation disruption, critical facility access, and post-fire debris flow, each of which poses cascading consequences for emergency response, economic activity, and long-term infrastructure resilience.

Population at Risk

Populations living near stream corridors, within canyon drainages, or on post-fire landscapes face the greatest risk. Residents in low-lying areas or in mobile homes, especially in unincorporated areas, are particularly vulnerable to fast-rising waters. Visitors camping or hiking in remote canyon areas are also at elevated risk during summer thunderstorms.

Impacted Areas

Flooding risk is distributed unevenly but exists throughout the planning area:

- Tarryall Creek corridor: prone to snowmelt and flash flooding
- South Platte River (Middle and South Forks): potential for riverine flooding
- Burn scar areas near Hartsel and Bailey: increased flash flood/debris flow potential
- Bailey and Guffey areas: limited drainage and creek flooding potential

Community Vulnerability

Many residential areas are built near drainages and creeks, often without updated floodplain mapping or drainage infrastructure. Numerous private roads and driveways cross flood-prone channels without proper culverts or bridges. Emergency access is often hindered by flood-damaged roads, and limited flood warning systems outside of NOAA alerts reduce the time available for evacuation.



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Table 39. Exposure Floods

Category	Value / Range	Interpretation
Total Buildings Exposed	350 – 500	A limited number of structures are located within mapped floodplains or areas of localized flooding, primarily near creeks, rivers, and drainages such as the South Platte River, Tarryall Creek, and Fourmile Creek. Exposure is moderate compared to Front Range counties.
Critical Facilities Exposed	10 – 15	Includes select fire stations, road maintenance facilities, and utility assets near river crossings or low-lying areas. Backup power and floodproofing measures are generally limited.
Population Exposed	≈ 600 – 900 (≈ 5% of total population)	Most residents live outside FEMA Special Flood Hazard Areas (SFHAs), but small concentrations in Fairplay, Lake George, and Jefferson experience recurring flood exposure.
Total Exposure Valuation	\$60 million – \$90 million	Represents the estimated structural and content value of buildings and infrastructure within flood-prone areas. While relatively modest in total, localized losses can be severe for individual properties.
Transportation Network Exposure	≈ 75 mi of flood-prone roads and crossings	County roads, culverts, and low-water crossings frequently experience damage or closure during spring runoff or intense convective storms, isolating rural residents and delaying emergency response.
Economic Exposure	\$1.5 – \$3 million per significant flood event	Includes costs from road washouts, infrastructure repairs, debris removal, and business interruption. Severe events may cause multi-million-dollar losses to the county's transportation and public works sectors.
Overall Risk Level	Moderate	While flood exposure is geographically limited, localized flash flooding, drainage failures, and riverine inundation pose recurring threats. Mountain terrain and limited flood control infrastructure increase vulnerability where development intersects floodplains.

Lifelines

Flooding events in the planning area can significantly disrupt multiple critical community lifelines. The transportation system is particularly vulnerable, as flooding can wash out roads, overtop bridges, and collapse culverts, especially in remote areas where alternative routes are limited. These impacts not only delay emergency response but can isolate entire communities. Energy systems are also at risk, with underground utilities and fuel tanks susceptible to damage or displacement during flood events. Power outages may occur if access to substations or transformers is compromised, and backup power systems may be limited in rural areas.



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Communication infrastructure can be affected if access to cellular towers or power supply is disrupted, reducing residents' ability to receive emergency alerts. Health and medical services may be delayed or unreachable during floods, placing vulnerable populations at elevated risk, particularly if they require medical transport or home care services. Floodwater can also contaminate private wells and septic systems, limiting access to safe drinking water and functional sanitation. Shelter needs may increase during flood events, especially for residents in low-lying or stream-adjacent housing, though the county has limited capacity for emergency shelter operations. Collectively, these lifeline disruptions can extend the duration and severity of flood impacts well beyond the initial event.

Interconnected Hazards

Flooding in the planning area is closely interconnected with several other hazards, creating potential for cascading effects. One of the most prominent linkages is with wildfire: burned areas, especially those recently affected by high-intensity wildfires, are prone to post-fire flooding and debris flows. These debris-laden flash floods are highly destructive and can occur even during short rainfall events. Flooding can also trigger or exacerbate landslides, particularly in steep terrain where soils become saturated and unstable. Infrastructure failures are another secondary hazard, as intense water flows can cause the breach of under-engineered culverts, low dams, or retention ponds, further accelerating water damage. Public health risks may also rise following flood events, due to contaminated drinking water, mold in flooded structures, or disrupted sanitation systems. In some cases, damage to roadways during floods can impede response to other simultaneous or subsequent hazards, such as severe winter storms, fires, or medical emergencies. These interconnected risks emphasize the need for multi-hazard planning and investment in resilient infrastructure.

Recent and Future Development

Recent development trends in Park County show an increase in residential construction in rural, forested, and stream-adjacent areas, particularly in subdivisions with limited infrastructure, such as gravel roads, minimal drainage controls, and undersized culverts. Many of these areas were developed prior to modern land-use and stormwater management standards, leaving them exposed to runoff and drainage issues. Future development, especially on the urban-wildland interface and in unincorporated communities, could further elevate flood risk if not managed carefully. Increases in impervious surfaces and road construction without adequate engineering can intensify localized flooding. Moreover, post-wildfire redevelopment in burn scar regions may face persistent flood threats for several years following a fire. To reduce long-term vulnerability, the planning area should encourage responsible development practices that include maintaining setbacks from water bodies, using flood-resistant construction methods, and improving drainage infrastructure. Local regulations, permitting practices, and subdivision approvals should incorporate up-to-date flood risk data, even in areas that are not formally mapped by FEMA but known to experience repetitive nuisance or flash flooding.



Recent and Future Development

Recent and ongoing development patterns in Park County have modestly increased exposure to flood hazards, particularly in low-lying areas along stream corridors and near major transportation routes. Residential growth has occurred primarily in unincorporated communities such as Bailey, Jefferson, Hartsel, and Guffey, where small subdivisions and rural homes are often built near creeks, drainage crossings, or natural depressions that can collect runoff during intense storms. Within incorporated towns like Fairplay and Alma, infill development and redevelopment projects have added impervious surfaces that slightly elevate localized drainage risks, particularly where stormwater systems are undersized or aging.

Future development trends suggest continued population growth in the Highway 285 corridor and expansion of second-home construction in scenic or recreational areas, including the Tarryall Creek and South Park Basin regions. These patterns, combined with increased short-term rental conversions and rural roadway expansion, may extend the footprint of developed land within flood-prone watersheds. Without careful land use planning, these changes could place additional strain on existing culvert networks, road crossings, and emergency response infrastructure during high-intensity rain events.

Park County's land use policies generally discourage construction within mapped FEMA Special Flood Hazard Areas (SFHAs); however, unmapped flash-flood zones and areas subject to post-wildfire runoff remain under-assessed and continue to pose significant risk. As the county updates its subdivision regulations and integrates stormwater and watershed management standards into planning reviews, new mitigation opportunities exist to better manage runoff, improve drainage infrastructure, and reduce long-term vulnerability. Proactive coordination with the Colorado Water Conservation Board (CWCB) and participation in the National Flood Insurance Program (NFIP) will remain critical for managing future development in and near flood-prone areas.

Consequence Analysis

Flooding events in the planning area can isolate communities, damage infrastructure, and lead to injury or death, particularly in fast-moving flash floods. Transportation networks may be disrupted for days, limiting access for emergency services. Cleanup and repair of damaged culverts, roads, and property often takes weeks and strains local budgets. Agricultural losses, including damaged fencing, irrigation, and livestock stress, can be significant. Public trust in infrastructure and safety systems may also erode following major events, especially where warning or evacuation systems are lacking.



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Table 40. Flooding Consequence Analysis – Park County

Consideration	Description
Public	Flooding poses direct risks to life safety through fast-moving water, debris flows, and isolation of residents in low-lying or remote areas. Individuals attempting to drive through flooded roadways remain at highest risk of injury or fatality. Vulnerable populations, including the elderly and those without access to reliable transportation, face additional danger during flash flood events.
Responders	Emergency personnel face hazardous conditions from swift water, unstable roadways, and debris during response operations. Post-fire flooding and debris flows increase responder safety risks, and prolonged recovery can strain limited local resources.
Continuity of Operations (Government)	Flood events can disrupt county and municipal operations by damaging public buildings, limiting road access, and isolating staff and equipment. Power or communications outages can hinder emergency coordination and delay recovery efforts.
Public Confidence in Government	Ineffective warning, delayed recovery, or inadequate flood mitigation measures can reduce public trust in local and state government institutions. Transparent communication and visible mitigation investments improve public confidence.
Property	Floodwaters and debris flows can damage homes, outbuildings, and driveways; undermine foundations; and destroy personal property. Rural structures near drainage crossings or seasonal creeks face repeated exposure to flash flooding.
Facilities & Infrastructure	Roads, culverts, bridges, and utilities are highly vulnerable to washouts and erosion. Damage to transportation routes and drainage crossings disrupts daily travel and emergency response and may take months to repair.
Environment	Flooding erodes soils, damages riparian habitats, and increases sedimentation in streams and reservoirs. Post-fire debris flows can degrade water quality and aquatic ecosystems for years following a burn event.
Economic	Repeated flood damage to roads and infrastructure leads to escalating maintenance costs. Flooding can temporarily halt tourism, delay goods transport, and increase repair costs for public and private entities. Local governments face financial pressure from repeated recovery and debris removal efforts.



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Multi-Jurisdictional Concerns

Table 41. Multi-Jurisdictional Hazards Assessment – Flooding

Jurisdiction / Partner	Shared Flooding Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Flash flooding and debris flows from high-elevation watersheds; culvert failures on rural roads	Aging drainage infrastructure; undersized culverts; limited post-fire erosion control capacity	Replace undersized culverts; improve drainage crossings; implement post-fire watershed mitigation and slope stabilization projects
Town of Fairplay	Urban drainage and surface runoff; localized ponding during heavy rain	Undersized storm drains and paved runoff areas downtown	Upgrade stormwater system; add detention basins and green infrastructure; improve road drainage near U.S. Highway 9
Town of Alma	Rapid runoff and debris flows from steep slopes and snowmelt	Single road access limits evacuation: high elevation accelerates snowmelt flooding	Coordinate with CDOT for drainage improvements; install stormwater controls and slope stabilization
Town of Jefferson / Como Area (JEFF FPD)	Flash flooding along Highway 285 and adjacent drainages	Roadway washouts, sediment accumulation, and limited maintenance funding	Install additional culverts; improve roadside grading and ditching; expand public warning signage
Platte Canyon Fire Protection District	Drainage and debris flows in canyons along the North Fork of the South Platte River	Narrow canyon corridors, limited space for protective works	Support watershed restoration projects; improve communication and access during flood response
Lake George Fire Protection District	Runoff and debris flow potential along Pike National Forest drainages	Limited access to high-risk recreation zones and campgrounds	Collaborate with U.S. Forest Service for floodplain restoration and emergency access improvements
Southern Park County Fire Protection District (Guffey)	Flash flooding and erosion on steep hillsides following summer thunderstorms	Scattered rural homes and roads vulnerable to washouts	Conduct community outreach on flood insurance and defensible drainage; expand local mitigation projects



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Jurisdiction / Partner	Shared Flooding Concerns	Notable Vulnerabilities	2025 HMP Priorities
North-West Fire Protection District	Seasonal flash flooding and roadbed erosion in remote subdivisions	Sparse population and long response distances	Enhance local drainage mapping; identify alternate egress routes during flood events
Hartsel Fire Protection District	Flooding from localized heavy rain and snowmelt in open rangeland	Low-lying rural roads with poor drainage; limited watercourse management	Upgrade culverts and bridges; develop quick-response flood barricade program
South Park Ambulance District	Countywide access issues during flood emergencies	Road closures delaying patient transport; isolation of outlying residents	Improve flood route mapping for EMS; coordinate mutual aid transport options during major events
Colorado Department of Transportation (CDOT)	Drainage failures and debris accumulation along U.S. Highway 285 and State Highways 9 and 77	Damage to highway embankments and culverts; limited local detours	Maintain coordination on culvert upgrades, hazard signage, and emergency detour management

Hazard Summary

Flooding affects all participating jurisdictions within Park County, with the greatest risks concentrated along drainages such as Tarryall Creek, Fourmile Creek, Trout Creek, and the South Platte River headwaters. Exposure levels vary by community, reflecting differences in topography, development density, and drainage infrastructure. The Hazard Summary Table provides a jurisdictional overview of estimated population, structures, and critical facilities exposed to flood hazards, along with associated risk categories and key vulnerabilities. The Quantitative Risk Summary Table supplements this information by summarizing the countywide exposure metrics, including buildings, valuation, and population trends compared to the previous plan cycle. Together, these tables illustrate the broad but uneven distribution of flood risk across the planning area and highlight where targeted mitigation—such as drainage improvements, culvert replacements, and floodplain management—can most effectively reduce vulnerability.



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Table 42. Hazard Summary – Flooding

Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 14,500 (≈ 82 % of total)	≈ 2,800 – 3,200	≈ 60 – 80	\$150 M – \$350 M	High	Extensive flashflood and debris-flow exposure in mountain drainages; undersized culverts and eroded road crossings; recurring post-fire runoff impacts.
Town of Fairplay	≈ 900	≈ 250 – 300	4 – 6	\$18 M – \$25 M	Moderate to High	Urban drainage and ponding in downtown area; limited storm-drain capacity; occasional flooding along Hwy 9 corridor.
Town of Alma	≈ 325	≈ 100 – 125	1 – 2	\$8 M – \$10 M	High	Steep terrain and rapid snowmelt increase flash-flood potential; single access route limits evacuation.
Town of Jefferson / Como Area (JEFF FPD)	≈ 400	≈ 150 – 200	1 – 2	\$10 M – \$12 M	Moderate to High	Flash-flood risk along Hwy 285; sedimentation



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						n and culvert blockage common during summer storms.
Platte Canyon FPD	≈ 6,500	≈ 1,200 – 1,400	10 – 12	\$80 M – \$110 M	High	Canyons of the North Fork South Platte River subject to flash flooding and debris flows; limited egress and narrow canyon roads.
Lake George FPD	≈ 2,500	≈ 500 – 600	5 – 7	\$35 M – \$50 M	Moderate to High	Runoff from Pike National Forest drainages; campground and recreation impacts; watershed sedimentation.
Southern Park County FPD (Guffey)	≈ 2,000	≈ 400 – 500	3 – 5	\$25 M – \$35 M	Moderate	Localized flash flooding in narrow canyons; limited drainage infrastructure and long response times.



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Jurisdiction / Fire District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
North-West FPD	≈ 900	≈ 200 – 250	2 – 3	\$15 M – \$20 M	Moderate	Remote subdivisions with undersized culverts; poor drainage maintenance increases isolation risk.
Hartsel FPD	≈ 1,000	≈ 250 – 300	2 – 3	\$20 M – \$25 M	Moderate to High	Flat basin prone to sheet flow and ponding; road washouts along CR 77 corridor.
South Park Ambulance District	—	Countywide coverage	Countywide	—	—	Provides EMS and evacuation support; access limited by bridge and road closures during major flood events.



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Table 43. Quantitative Risk Summary – Flooding

Exposure Metric	2025 Estimate	Change Since 2020
Buildings Exposed (1 % Annual Chance + Flash Flood Zones)	≈ 3,000 – 3,500	+ 10 %
Population Exposed to Flood Hazards	≈ 15,000 (≈ 85 % of county)	+ 3 %
Critical Facilities Exposed	≈ 70 – 90	+ 5 %
Estimated Total Exposure Valuation	\$180 M – \$380 M	+ 12 %
Annual Probability of Flood Event	High (Every 1–3 Years Countywide; Localized Annually)	—

Source: FEMA Flood Insurance Rate Maps (FIRMs); Colorado DHSEM Hazard Data Portal (2024); Colorado Water Conservation Board (CWCB); NCEI Storm Events Database (1995–2024); Park County OEM and Public Works.



Hazard: Drought

Background

Drought is a recurring concern in the planning area, where water supplies for agriculture, firefighting, and residential use depend on consistent snowpack and limited groundwater sources. The South Park Basin, while known for its natural beauty and grazing potential, is particularly vulnerable to prolonged dry periods. Drought conditions also intensify wildfire risk and reduce vegetation cover, increasing erosion and water quality concerns. The county has experienced multiple USDA-designated drought declarations in the past decade.

Definition

The planning area hereby adopts the definition as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Location and Event

Drought can impact the entire planning area due to its largely rural landscape, high elevations, and dependence on surface and groundwater sources. Both incorporated areas and rural unincorporated communities are susceptible, including agricultural lands, forested regions, and residential developments that rely on private wells and limited water infrastructure.

ADD MAP

Figure 19. Drought Map Park County

Several environmental and systemic factors contribute to the planning area's susceptibility to drought. Park County's high elevation and thin soils limit water retention, while the region's dependence on seasonal snowpack for water supply makes it highly sensitive to fluctuations in snowfall and melt timing. Weather variability, including cyclical El Niño and La Niña patterns, often dictates regional precipitation, and long-term aridification trends in the Intermountain West further exacerbate water scarcity. Additionally, the planning area's sparse surface water infrastructure and reliance on decentralized private wells and small-scale community systems increase vulnerability to water shortages during dry periods.

Past Occurrences

The planning area has experienced several significant drought events over the past three decades, reflecting statewide trends across Colorado's high mountain basins and South Platte River watershed. Historical records from the U.S. Drought Monitor (USDM) and the National Centers for Environmental Information (NCEI) indicate that prolonged drought conditions occur in the county approximately once every 5 to 7 years, with severe to extreme drought (D3–D4) designations recorded multiple times since 2000.



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One of the most notable drought periods occurred between 1999 and 2004, when reduced snowpack and persistent low precipitation led to widespread agricultural and ecological stress throughout central Colorado. The drought of 2012–2013 again brought exceptional (D4) conditions to much of Park County, severely reducing rangeland productivity, drying surface water sources, and contributing to an elevated wildfire risk that culminated in the 2012 Springer and Lake George Fires. During this period, streamflows on Tarryall Creek and the South Platte headwaters fell below 50% of normal levels, prompting voluntary water restrictions and early livestock sell-offs among local ranchers.

Another significant drought episode occurred from 2018 through early 2021, when consecutive years of below-average precipitation and above-average temperatures created extreme dryness across Park County's grasslands and forests. The 2018–2020 drought ranked among the driest three-year spans on record for the South Park Basin, reducing hay yields by more than 30% and forcing reliance on supplemental feed. By late 2020, the USDM classified nearly all of Park County as D3 (Extreme Drought), with pockets reaching D4 (Exceptional Drought). These conditions persisted into early 2021, intensifying wildfire danger and stressing surface and groundwater resources.

While 2022 and 2023 brought modest improvements due to enhanced snowpack, drought remains a recurrent and escalating hazard in the planning area due to increasing temperatures, reduced soil moisture retention, and higher evaporative demand. The cumulative effects of recent droughts—particularly those of 2002, 2012, and 2020—underscore the vulnerability of the county's agricultural sector, water supply systems, and natural ecosystems to prolonged dry periods.

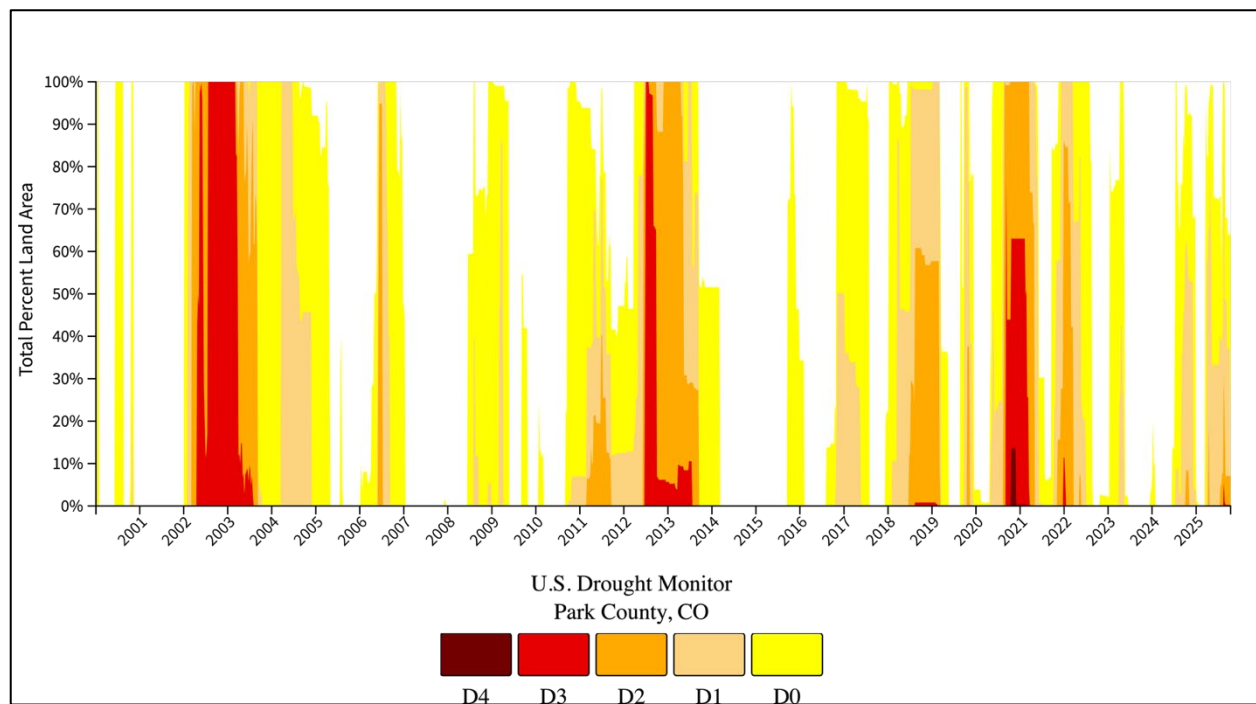


Figure 20. Drought Monitor Park County



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Table 44. Drought Impacts

Type of Event	Area Impacted	Events	Death	Injury	Property Damage	Crop Damage	Prior Reports
Drought	Park County	8	0	0	0	0	0
Total	Park County	8	0	0	0	0	0

Previous Losses

Agricultural producers experienced lower crop yields, increased feed costs, and water hauling expenses. Some residents had to deepen or replace wells due to dropping groundwater levels. Drought also increases local government costs related to emergency water supply, public education campaigns, and wildfire mitigation.

Table 45. Notable Drought Events

Year(s)	Drought Intensity (USDM Peak)	Description / Impacts	Notes / Sources
1999–2004	D3–D4 (Extreme to Exceptional)	Multi-year drought across central Colorado severely reduced snowpack and streamflow in the South Platte Basin. Livestock feed costs rose sharply; voluntary water restrictions implemented in several communities.	One of the driest periods in recorded history; streamflow reductions of 40–60% below normal.
2006–2008	D2–D3 (Severe to Extreme)	Below-average precipitation caused decreased rangeland productivity and early drying of small reservoirs.	Localized agricultural stress and diminished forage availability across the South Park Basin.
2012–2013	D4 (Exceptional Drought)	Extreme dryness reduced pasture yields by over 50%, triggered voluntary water restrictions, and elevated wildfire risk throughout the county.	Associated with the Springer and Lake George wildfires; lowest streamflow since 2002.
2018–2021	D3–D4 (Extreme to Exceptional)	Consecutive dry winters and record-high summer temperatures led to reduced hay yields, declining reservoir storage, and widespread agricultural impacts.	Ranked among the top three driest multi-year droughts for Park County; USDM classified nearly all of the county as D3 or D4.



Year(s)	Drought Intensity (USDM Peak)	Description / Impacts	Notes / Sources
2022–2023	D1–D2 (Moderate to Severe)	Recovery period with improved snowpack but lingering soil moisture deficits and stressed range conditions.	Marked by variable monsoonal activity; partial recovery of groundwater storage observed by USGS.
2024 (Ongoing Seasonal Dryness)	D0–D1 (Abnormally Dry to Moderate)	Intermittent early-season dryness reported in high valleys; minimal agricultural impact due to strong winter snowpack carryover.	Monitoring continues for potential late-summer dryness.

Extreme Drought Events

Extreme drought events in the planning area have occurred with increasing frequency and severity. These events are typically marked by extended periods of significantly below-normal precipitation, sustained high temperatures, declining snowpack, and major water supply impacts.

During the 2012 and 2020 events, much of the county reached D3 (Extreme Drought) classification, resulting in livestock stress, and the loss of vegetative cover. These conditions often lead to increased costs for ranchers, the need for emergency declarations, and critical fire danger due to dry fuels. The combination of prolonged dry spells and warming temperatures associated with weather changes has intensified the duration and impact of these events.

Disaster Declarations

While drought conditions are a recurring feature of Park County’s high-elevation climate, only the most prolonged and severe events have resulted in formal disaster declarations. Unlike other hazards that may trigger FEMA major disaster declarations, drought is typically recognized through U.S. Department of Agriculture (USDA) Secretarial Disaster Designations, which authorize low-interest emergency loans, feed assistance, and other forms of agricultural relief. Park County has been included in multiple USDA drought designations since 2000, most often as a primary county experiencing direct agricultural and rangeland impacts. The county has also been covered under statewide or regional drought emergency orders issued by the Governor of Colorado, activating state-level monitoring and response coordination through the Colorado Water Conservation Board (CWCB) and Drought Task Force.

These declarations reflect the cumulative effects of extended precipitation deficits, diminished snowpack, declining streamflow, and stressed forage conditions that have repeatedly impacted Park County’s ranching and agricultural economy. The table below summarizes major drought-related declarations affecting Park County, including both federal and state-level actions since 2000.



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Table 46. Drought-Related Disaster Declarations

Declaration Number / Type	Year(s)	Declaration Type	Event Description	Areas / Jurisdictions Affected	Impacts / Notes
USDA Secretarial Disaster Designation #S2187	2002–2003	Federal (Agricultural)	Severe and prolonged drought impacting forage, rangeland, and livestock production.	Park County (Primary)	Significant agricultural and water resource losses; emergency feed programs activated.
USDA Secretarial Disaster Designation #S3449	2012–2013	Federal (Agricultural)	Exceptional drought (D4) across central Colorado; extremely low snowpack and rangeland productivity.	Park County (Primary)	One of the driest periods on record; emergency loans and disaster assistance authorized.
USDA Secretarial Disaster Designation #S4441	2018–2019	Federal (Agricultural)	Multi-year drought and reduced precipitation across the South Park Basin and Upper South Platte watershed.	Park County (Primary)	Low hay yields; elevated wildfire risk; livestock feed and water hauling assistance provided.
USDA Secretarial Disaster Designation #S4978	2021	Federal (Agricultural)	Extreme drought conditions (D3–D4) across much of Colorado; severe impacts on rangeland and water resources.	Park County (Primary)	Pasture conditions rated “poor to very poor”; authorized USDA emergency conservation assistance.
Colorado State Disaster Emergency Order 2021-019	2021	State Declaration	Statewide drought emergency declaration activating drought task force and response coordination.	Statewide (including Park County)	State-level monitoring and resource coordination initiated for agricultural drought impacts.
USDA Secretarial	2022	Federal (Agricultural)	Continuing drought across central	Park County (Primary)	Agricultural losses persisted;



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Declaration Number / Type	Year(s)	Declaration Type	Event Description	Areas / Jurisdictions Affected	Impacts / Notes
Disaster Designation #S5128			Colorado; below-normal soil moisture and streamflow.		some recovery in 2023 following improved snowpack.

Source: U.S. Department of Agriculture (USDA) Farm Service Agency Disaster Designations (2000–2025); Colorado Drought Task Force Reports; U.S. Drought Monitor (USDM); Colorado DHSEM Disaster Database.

Probability of Future Occurrences

Drought will remain a high-probability hazard for the planning area, recurring on a cyclical basis consistent with long-term precipitation and temperature patterns across the South Park Basin and central Colorado mountains. Historical data from the U.S. Drought Monitor (USDM) and the Colorado Climate Center indicate that the county experiences moderate to severe drought (D1–D3) conditions in at least one season nearly every year, with extreme or exceptional drought (D3–D4) episodes occurring approximately once every five to seven years. Periods of recovery are often short-lived, as snowpack variability and higher evaporation rates lead to renewed dryness within one to two years of improvement.

Climate projections through 2050 suggest a continuation of this pattern, with higher average temperatures, earlier snowmelt, and increased evapotranspiration offsetting potential gains from intermittent wet years. These factors are expected to produce longer dry seasons, more frequent soil moisture deficits, and elevated stress on rangelands and water supplies. While irrigation and reservoir storage mitigate some impacts in the short term, sustained warming and inconsistent precipitation are projected to intensify drought severity and duration over the next several decades.

Based on historical recurrence, observed climatic trends, and agricultural sensitivity, the probability of future drought occurrence in the planning area is rated as High—indicating that drought conditions are expected to develop in some portion of the county each year, with countywide extreme drought episodes likely to reoccur within a 5- to 10-year interval.

Future Costs

The economic impacts of future droughts in the planning area are projected to remain substantial, particularly for the agricultural, livestock, and water management sectors. Based on modeling from the Future Avoided Cost Explorer (FACE) tool and regional analyses by the Colorado Climate Center, annualized drought-related losses for Park County are currently estimated at \$1.0 to \$2.5 million per year, primarily reflecting reduced forage yields, livestock production losses, supplemental feed purchases, and increased water hauling costs. Under continued warming and increased variability in precipitation, annual drought damages could rise to \$3–\$4 million per year by 2050, even when accounting for partial recovery in wetter cycles.



Secondary impacts, including higher wildfire potential, degraded water quality from shrinking streamflows, and soil erosion from desiccated ground cover, can add millions in indirect costs across public works, natural resource management, and emergency response budgets. Extended dry conditions also reduce recharge to aquifers and small reservoirs, creating long-term financial burdens for water districts and private well owners who must deepen or replace wells. The tourism and recreation economy, which depends heavily on consistent streamflow, snowpack, and lake levels, faces further economic sensitivity to prolonged drought, particularly during summer wildfire restrictions or poor winter snowfall years.

Without proactive investments in rangeland management, water storage efficiency, drought-resistant crop programs, and wildfire mitigation, the long-term financial burden of drought is expected to increase by 30–50% over the next 25 years.

Conversely, full implementation of mitigation measures identified in this plan—such as improved watershed restoration, livestock water system upgrades, and expanded drought contingency planning—could reduce projected losses by up to one-third, enhancing agricultural and community resilience countywide.

Table 47. Estimated Future Costs Associated with Drought

Impact Category	Estimated Annual Cost Range (\$)	Primary Cost Drivers	Notes / Future Trend
Agriculture and Livestock	\$800,000 – \$1,800,000	Forage loss, hay imports, livestock sale losses, and supplemental feed costs	Primary economic impact sector; costs increase sharply during multi-year droughts; potential 40–50% rise by 2050 without mitigation.
Water Supply and Infrastructure	\$250,000 – \$600,000	Reduced surface water availability, groundwater depletion, well replacement, and hauling costs	Water systems and private wells increasingly strained; higher capital costs for new or deeper wells anticipated.
Wildfire and Vegetation Management	\$200,000 – \$400,000	Increased wildfire suppression and fuel mitigation costs; post-fire erosion repair	Drought intensifies fire frequency and suppression expenditures; indirect drought cost driver.
Environmental and Natural Resources	\$100,000 – \$250,000	Habitat loss, stream degradation, and soil erosion	Long-term recovery costs for rangeland and riparian ecosystems; growing concern for watershed stability.
Economic and Public Sector Impacts	\$75,000 – \$200,000	Tourism losses, reduced recreation use, and emergency response operations	Secondary effects include lost tourism revenue, higher utility expenses, and public outreach/supply coordination.



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Total Estimated Annual Economic Impact	\$1.4 – \$3.2 million	—	Represents cumulative annualized drought-related losses across all sectors; projected to rise 30–50% by 2050 under moderate-to-high growth scenarios.

Source: Future Avoided Cost Explorer (FACE) Tool (2024); U.S. Drought Monitor (2000–2025); Colorado Climate Center; USDA NRCS South Platte Basin Drought Data; Park County OEM and CSU Extension.

Risk and Vulnerability

Drought poses a high risk to the planning area, particularly for rural residents, agricultural producers, and forest ecosystems. Households that rely on private wells are especially vulnerable when groundwater tables decline. Small water systems may lack the storage or treatment capacity to meet demand during prolonged dry periods. Ranchers and farmers face threats to crop and livestock production, and outdoor-based economies such as hunting, fishing, and tourism suffer during environmental degradation.

Population at Risk

Rural households and individuals relying on well water are among the most at-risk during drought events. Farmers and ranchers across South Park Basin, as well as residents in unincorporated areas like Hartsel and Guffey, experience the direct economic and operational impacts of water scarcity. Populations with fewer financial resources are less able to afford water hauling, system upgrades, or loss of agricultural income.

Impacted Areas

Drought affects the entire planning area but disproportionately impacts certain regions. The South Park Basin is particularly vulnerable due to its concentration of agricultural activity and reliance on surface and groundwater for irrigation and livestock. Forested areas in the high country become more susceptible to wildfire due to vegetation stress. Communities without centralized water infrastructure experience elevated risk when drought affects well production.

Community Vulnerability

Vulnerable communities include those with limited water storage capacity, economic dependence on agriculture, or older infrastructure. Fairplay and Alma may face challenges due to limited backup water sources, while unincorporated areas lack the resources for widespread mitigation. Environmental degradation also affects recreation and tourism, which are key components of the planning area's economy.



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Table 48. Drought Exposure Summary

Category	Value / Range	Interpretation
Total Buildings Exposed	Countywide ($\approx$ 5,800 structures)	All structures in Park County are indirectly exposed to drought impacts through water supply reductions, increased fire danger, and soil instability. Exposure is not spatially confined.
Critical Facilities Exposed	90 – 110	All public facilities depend on reliable groundwater or small community systems. Extended drought can reduce well production and impair firefighting capability.
Population Exposed	$\approx$ 17,700 (100% of residents)	The entire population is affected by drought-related shortages or restrictions. Rural residents reliant on private wells or small water systems face the highest vulnerability.
Total Exposure Valuation	\$850 million – \$1.1 billion	Reflects the total estimated value of property, infrastructure, and economic activity indirectly affected by drought conditions, including agricultural and water-related losses.
Agricultural and Rangeland Exposure	$\approx$ 280,000 acres of grazing and hay land	Agriculture is among the most drought-sensitive sectors. Forage production losses, livestock stress, and higher feed costs create cascading economic impacts.
Economic Exposure	\$1.4 – \$3.2 million per year (average)	Based on projected annualized drought losses for agriculture, water infrastructure, and secondary effects such as reduced tourism and wildfire suppression costs.
Environmental Exposure	Countywide	Drought affects vegetation health, wildlife habitat, and water quality across the entire South Park Basin, contributing to erosion, sedimentation, and ecosystem decline.
Overall Risk Level	High	Drought is a recurring and escalating hazard. Countywide exposure, limited water storage, and dependence on shallow groundwater increase both short- and long-term vulnerability.

Lifelines

Drought impacts in the planning area can disrupt multiple FEMA Community Lifelines, particularly those related to Food, Water, Shelter, Energy, and Health and Medical systems. Prolonged dry conditions reduce streamflow, deplete groundwater reserves, and impair the reliability of both municipal and private well systems, directly affecting the Food, Water, Shelter lifeline. Agricultural and livestock operations, key components of the local economy, experience significant stress from reduced forage, limited irrigation capacity, and water hauling expenses, which in turn strain the Economic Stability lifeline.



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The Energy lifeline is also affected as drought diminishes hydroelectric generation potential and increases the risk of power interruptions due to wildfire ignition near transmission corridors weakened by dry vegetation. Reduced soil moisture and elevated wildfire risk create cascading effects on the Safety and Security and Transportation lifelines, as emergency response agencies may face fuel shortages, vehicle overheating, or access limitations to remote communities.

Finally, prolonged drought exacerbates health concerns under the Health and Medical lifeline, including dust-related respiratory illnesses, water quality degradation from reduced flows, and stress-related health impacts among agricultural producers. These interdependencies illustrate that drought is not solely an agricultural concern but a systemic hazard that can undermine the planning area's critical lifeline resilience across multiple sectors.

Interconnected Hazards

Drought is interlinked with several other hazards. It dramatically increases wildfire risk by drying out fuels. It can also contribute to dust storms and soil erosion in overgrazed or exposed landscapes. Economic stress from drought can reduce local resilience to other hazards such as extreme weather, and prolonged dry conditions can degrade critical water and power infrastructure.

Recent and Future Development

Recent development trends in Park County, including dispersed residential growth and recreational home construction, have placed additional pressure on limited water resources. Many of these new properties rely on private wells or small-scale systems, which are particularly vulnerable to drought. Without integrated planning for sustainable water use, future development could exacerbate water scarcity.

Changes in Vulnerability

Since the previous Hazard Mitigation Plan update, the planning area's vulnerability to drought has increased measurably due to the combined effects of sustained population growth, expanded development in rural and agricultural zones, and compounding environmental stressors. The county's reliance on limited groundwater and small surface reservoirs has heightened sensitivity to even short-duration droughts, particularly in unincorporated communities where private wells are the primary water source. Prolonged dry periods between 2018 and 2021 demonstrated the fragility of local water supplies, as several shallow wells in the South Park Basin temporarily failed or required deepening.

Agricultural vulnerability has also intensified as forage availability and grazing productivity continue to decline under variable precipitation and warmer temperatures. Many ranching operations have had to rely more heavily on imported feed or reduced herd sizes, raising operational costs and long-term economic stress. Additionally, drought-driven vegetation loss and lower soil moisture have increased the potential for wildfire ignition, dust events, and erosion, further amplifying secondary hazard exposure.

Social vulnerability to drought has likewise expanded, particularly among low-income and older populations with limited adaptive capacity to rising costs of water, food, and energy.



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These populations are disproportionately impacted by resource shortages and degraded air quality during extended dry spells. Given these combined factors, the planning area's overall drought vulnerability has shifted from Moderate in the previous plan to High in the current assessment, underscoring the need for targeted water management, agricultural adaptation, and resilience investments to sustain the county's rural economy and public health under future dry conditions.

Consequence Analysis

Consequences of drought in the planning area are significant and widespread. Water shortages impact households, livestock, and firefighting capabilities. Economic losses occur in agriculture and tourism. Environmental stress leads to wildlife displacement, tree death, and increased erosion.

Social consequences include mental health strain, increased living costs, and decreased public trust in local response capabilities. A prolonged or extreme drought could overwhelm small utility systems, stress emergency response operations, and result in long-term damage to Park County's natural and economic resources.

Table 49. Drought Consequence Analysis

Consideration	Description
Public	Drought poses indirect but widespread impacts to public health and well-being through reduced water availability, higher utility costs, and degraded air quality from dust and wildfire smoke. Vulnerable populations—including seniors, low-income residents, and those dependent on private wells—are disproportionately affected.
Responders	Extended drought strains emergency response resources by increasing wildfire activity, expanding the need for water hauling, and elevating responder fatigue during concurrent hazard events. Rural departments face greater operational costs and resource competition.
Continuity of Operations (Government)	Drought can disrupt public services through water supply shortages, increased maintenance costs, and resource allocation challenges. Limited water availability may hinder fire suppression, sanitation, and public facility operations.
Public Confidence in Government	Perceived delays in water restrictions, agricultural aid, or emergency declarations can reduce public confidence in local and state government responsiveness during prolonged drought emergencies.
Property	While drought itself causes limited structural damage, indirect impacts such as foundation shifting, well failures, and vegetation loss can degrade property conditions and reduce values, particularly in rural areas.
Facilities & Infrastructure	Prolonged dryness reduces reservoir levels, impacts well production, and can cause subsidence or cracking in roads and utility corridors. Infrastructure maintenance costs rise as soil instability and dust infiltration increase.



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Consideration	Description
Environment	Drought reduces streamflow, impairs aquatic habitats, and stresses forest and rangeland ecosystems. Vegetation die-off increases erosion and alters watershed hydrology, elevating the risk of flash flooding once precipitation returns.
Economic	Agricultural losses from forage decline, livestock culling, and crop failure create significant economic stress. Reduced recreation, tourism, and water-based activities further compound financial losses across local industries.

Multijurisdictional Hazards

Table 50. Hazard Summary Multi-Jurisdictional Hazards Assessment – Drought

Jurisdiction / Partner	Shared Drought Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide groundwater depletion, agricultural stress, and declining rangeland productivity	Reliance on private wells and small community systems; declining aquifer recharge; reduced forage yield	Develop drought contingency plans; promote water conservation; expand well-monitoring and drought reporting programs
Town of Fairplay	Seasonal water shortages and pressure on municipal supply during dry years	Limited water storage capacity; reliance on single supply source; tourism-related water demand	Implement water-use efficiency programs; diversify water supply sources; strengthen municipal drought ordinances
Town of Alma	Water scarcity during late summer and variable snowpack recharge	High-elevation isolation; small-scale water system with limited redundancy	Improve reservoir storage; install real-time water monitoring systems; coordinate drought alert communications
Hartsel FPD	Dry conditions increase fire ignition and reduce available water for suppression	Long distances between hydrants; dependence on portable tanks and natural water sources	Expand dry hydrant installations; improve water hauling capacity; integrate drought monitoring with fire risk assessments
Jefferson Area / JEFF FPD	Drying of stock ponds and surface wells; livestock water shortages	Agricultural dependence on natural springs and shallow wells	Develop water hauling and emergency livestock watering plans; coordinate



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Jurisdiction / Partner	Shared Drought Concerns	Notable Vulnerabilities	2025 HMP Priorities
			with NRCS and CSU Extension
Lake George FPD	Seasonal drought impacts on watershed and recreation zones	Reduced streamflow affecting water intakes; higher wildfire potential	Maintain watershed health; coordinate with USFS for fuel and vegetation management; promote water reuse
Platte Canyon FPD	Reduced water pressure and hydrant availability during extended drought	High WUI exposure; dependence on surface reservoirs	Integrate water storage planning with CWPP actions; promote homeowner defensible space and water retention projects
Southern Park County FPD (Guffey)	Long-term dryness affecting rural developments and grazing land	Limited firefighting water supply; scattered housing with private wells	Install additional fill stations; develop cooperative agreements for shared drought response and water supply
North-West FPD	Low precipitation and declining soil moisture impacting rural subdivisions	Remote, high-elevation areas with minimal water infrastructure	Support community education on well maintenance and drought adaptation; enhance rural water storage
South Park Ambulance District	Health and safety impacts from water scarcity and heat stress	Increased medical calls during prolonged drought or smoke conditions	Coordinate with Public Health for hydration and air-quality response programs; ensure responder support during high-heat periods

Hazard Summary

Drought is one of the most pervasive and economically significant hazards affecting the planning area. Due to its high elevation, limited surface water storage, and dependence on shallow groundwater, the county is especially sensitive to prolonged dry conditions. Historical drought records show recurring multi-year periods of precipitation deficit, leading to agricultural losses, reduced forage production, and strain on domestic and livestock water supplies. Nearly all residents and structures in the planning area are exposed to drought impacts, as the hazard affects both natural and built environments countywide.

The agricultural sector, which encompasses roughly 280,000 acres of grazing and hay production, is consistently the most vulnerable to economic losses from forage decline and increased feed costs. Rural residents relying on private wells also face heightened



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vulnerability due to declining aquifer recharge and deepening well requirements. Secondary effects, such as heightened wildfire risk, dust generation, and degradation of water quality, further amplify the hazard's impact.

While drought rarely causes direct structural damage, its indirect consequences are widespread and cumulative, influencing nearly every FEMA Community Lifeline, particularly Food, Water, Shelter, Energy, and Health and Medical. Based on current projections, drought frequency and severity are expected to increase due to warmer temperatures, variable snowpack, and extended dry seasons. The overall risk for the planning area is therefore assessed as High, reflecting countywide exposure, recurring historical occurrence, and significant long-term economic and environmental implications.

Table 51. Hazard Summary – Drought

Jurisdiction / District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 15,000 (≈ 85% of total)	≈ 5,000+	80 – 100	\$800 M – \$1.0 B	High	Countywide dependence on private wells; agricultural stress; reduced forage yield; elevated wildfire risk; limited groundwater recharge.
Town of Fairplay	≈ 900	≈ 300 – 350	4 – 6	\$25 M – \$35 M	Moderate to High	Limited water storage; seasonal water scarcity; tourism demand strain on small municipal systems.
Town of Alma	≈ 325	≈ 150 – 200	2 – 3	\$10 M – \$15 M	High	Small-scale mountain water system;



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Jurisdiction / District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						snowpack variability; limited drought redundancy.
Platte Canyon FPD	≈ 6,500	≈ 1,200 – 1,400	10 – 12	\$90 M – \$130 M	High	High WUI exposure; drought intensifies vegetation drying and fire ignition potential; limited alternate water sources.
Lake George FPD	≈ 2,500	≈ 600 – 700	5 – 7	\$40 M – \$60 M	High	Reduced watershed flow; drought-sensitive recreation economy; water intake vulnerability.
Southern Park County FPD (Guffey)	≈ 2,000	≈ 400 – 500	4 – 6	\$25 M – \$35 M	High	Reliance on shallow wells; rangeland degradation; reduced livestock water availability.
Hartsel FPD	≈ 1,000	≈ 250 – 300	2 – 3	\$15 M – \$25 M	Moderate to High	Grassland desiccation; low water supply for firefighting; extended



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Jurisdiction / District	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						response distances.
Jefferson Area (JEFF FPD)	≈ 400	≈ 175 – 225	1 – 2	\$10 M – \$15 M	Moderate	Livestock and small-agriculture losses; dependence on private surface wells.
North-West FPD	≈ 900	≈ 250 – 300	2 – 3	\$15 M – \$20 M	Moderate	Remote subdivisions with low water availability; limited well capacity during prolonged dry periods.
South Park Ambulance District	Countywide	Countywide	Countywide	—	High	Health and safety concerns during prolonged drought; increased responder fatigue and medical calls related to dehydration, dust, and air quality.



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Table 52. Quantitative Risk Summary – Drought

Exposure Metric	2025 Estimate	Change Since 2020 Plan	Interpretation
Population Exposed	≈ 17,700 (100%)	+3%	Entire county population is affected by drought through reduced water availability, elevated fire danger, and economic impacts.
Structures Exposed	≈ 5,800 (countywide)	+10%	Countywide exposure due to universal dependence on groundwater and limited surface storage; growth in rural subdivisions expands well use.
Critical Facilities Affected	90 – 110	+12%	Most facilities depend on groundwater wells or small utility systems; exposure increases as aging infrastructure faces higher demand.
Agricultural Land Exposed	≈ 280,000 acres	Stable	Represents primary drought-sensitive sector; continued forage and grazing stress expected during recurring dry cycles.
Total Exposure Valuation	\$850 million – \$1.1 billion	+15%	Represents cumulative property, infrastructure, and economic exposure; reflects population and construction growth since 2020.
Average Annualized Losses (AAL)	\$1.4 – \$3.2 million	+25%	Accounts for agriculture, water supply, and indirect economic effects; driven by prolonged drought cycles and higher feed and fuel costs.
Annual Probability of Occurrence	100% (recurring hazard)	—	Drought conditions develop annually to varying degrees, with severe to extreme events occurring every 5–7 years.
Projected Cost Increase by 2050	+30% to +50%	—	Based on FACE tool projections; increased losses expected without mitigation investment in water efficiency and resource management.



Hazard: Geological (Landslides & Avalanches)

Background

Landslides in the planning area range from slow-moving earth flows to rapid debris slides, often triggered by heavy precipitation, snowmelt, or the destabilization of slopes following wildfire. The county's geology includes areas of weak or fractured rock, colluvial deposits, and altered soils that are particularly susceptible to mass movement. Road corridors such as Highway 285 and Highway 9 traverse steep terrain where landslides have historically caused closures and required costly repairs.

Avalanches pose a substantial risk in Park County's higher elevations, particularly along the Continental Divide and in steep mountain valleys. Communities and transportation corridors at elevations above 9,000 feet are exposed to avalanche paths during winter and spring months. Backcountry recreation areas, including popular snowmobiling and skiing zones, also face elevated avalanche risk.

Geological hazards ranked among the top hazards of concern in the planning area based on the 2025 Hazard Ranking Worksheet, reflecting the county's terrain characteristics, historical occurrences, and potential for significant impacts to transportation infrastructure, public safety, and property.

Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Landslide: A landslide is the movement of rock, soil, or debris down a slope due to gravity. Landslides can be triggered by natural events such as heavy rainfall, rapid snowmelt, earthquakes, or volcanic activity, as well as human activities including construction, mining, and deforestation. They vary in size, speed, and impact, ranging from slow soil creep to rapid debris flows.

Avalanche: An avalanche is a rapid flow of snow, ice, and debris down a mountainside. Avalanches occur when snowpack becomes unstable due to factors such as heavy snowfall, wind loading, temperature fluctuations, or weak layers within the snow structure. They pose significant risks to backcountry recreationists, mountain communities, and transportation corridors in high-elevation areas.

Location and Extent

Park County's geological hazards are distributed across the planning area based on topographic, geologic, and climatic conditions. The Colorado Geological Survey (CGS) maintains mapping and data resources that identify landslide-prone areas and avalanche paths throughout the state, including Park County.

Landslide hazards in Park County are most prevalent in areas with steep slopes (generally greater than 25%), weak or fractured bedrock, areas affected by historical mining, and zones destabilized by wildfire. Key areas of concern include:



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- Highway 285 corridor, particularly through Kenosha Pass and Turkey Creek Canyon
- Highway 9 corridor between Fairplay and Hoosier Pass
- Steep slopes surrounding the towns of Bailey, Alma, and Jefferson
- Areas affected by recent wildfires, including burn scars from the Weston Pass Fire (2018) and 403 Fire (2023)
- Historical mining districts near Alma, Fairplay, and Como
- Stream corridors and canyon walls along the South Platte River and its tributaries

According to the Colorado Geological Survey's landslide inventory, Park County contains numerous mapped landslide deposits and areas classified as having moderate to high landslide susceptibility. These zones are characterized by slopes between 15% and 50%, geologic units prone to failure (including weathered granite, volcanic rocks, and sedimentary formations), and areas with poor drainage or groundwater seepage.

Figure 21. Landslide Susceptibility Map, Park County

[Map showing landslide susceptibility zones across Park County, with concentrations along major highway corridors and steep valley walls]

Avalanche hazards in the planning area are concentrated in high-elevation areas, particularly above 9,000 feet, where steep slopes, heavy snowfall, and temperature fluctuations create unstable snowpack conditions. Key avalanche-prone areas include:

- Continental Divide region, including terrain near Hoosier Pass, Boreas Pass, and Kenosha Pass
- Steep mountain valleys in the Mosquito Range and Park Range
- Backcountry recreation areas popular for snowmobiling and backcountry skiing
- Isolated residential areas and mining structures in high-elevation gulches
- Transportation corridors at higher elevations, particularly along Highway 9 above Alma

The Colorado Avalanche Information Center (CAIC) provides avalanche forecasts and maintains records of avalanche paths throughout the state. Park County falls within the CAIC's Central Mountains forecast zone, which includes significant avalanche terrain along the Continental Divide.

Figure 22. Avalanche Path Map, Park County

[Map showing known avalanche paths and high-risk avalanche terrain in Park County's mountain areas]

Park County's geological hazards exhibit spatial patterns consistent with broader trends observed across Colorado's mountain counties. Similar to neighboring Summit, Lake, and Clear Creek Counties, Park County's steep terrain, seasonal precipitation, and high-elevation environment create recurring landslide and avalanche risks. According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, Park County shares similar geological vulnerabilities with other Front Range and central mountain counties, where development in steep terrain and increased recreational activity in avalanche zones elevate exposure.



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The State HMP notes that landslide activity is expected to increase in areas affected by wildfire, where loss of vegetation and changes to soil structure reduce slope stability. Post-fire debris flows, a specific type of landslide triggered by intense rainfall on recently burned slopes, represent a growing concern in Park County following significant fires such as the Weston Pass Fire and 403 Fire.

Figure 23. State Landslide and Avalanche Risk Context

[State-level map showing Park County in context with surrounding counties' geological hazard zones]

Previous Occurrences

Park County has experienced numerous landslide events over the past several decades, ranging from minor slope failures to significant incidents affecting transportation infrastructure and property. Documentation of landslide occurrences in Park County is derived from Colorado Geological Survey records, Colorado Department of Transportation (CDOT) maintenance reports, local emergency management records, and media accounts.

Table 53. Previous Occurrences (Landslides)

Date	Location / Area	Type / Size	Cause / Notes / Impacts
May 2024	Highway 285, mile marker 228 (near Bailey)	Debris slide, ~500 cubic yards	Heavy spring rainfall; road closure for 8 hours; CDOT response.
April 2023	County Road 77 near Jefferson	Earth flow, ~200 cubic yards	Snowmelt saturation; road shoulder failure; temporary closure.
July 2022	Weston Pass burn scar area	Post-fire debris flow, ~1,500 cubic yards	Intense thunderstorm on burned slopes; impacted forest roads and drainage structures.
June 2021	Highway 9, south of Hoosier Pass	Rockfall, ~100 cubic yards	Freeze-thaw cycles; minor road damage; cleared by CDOT.
September 2020	Private property near Lake George	Slow earth flow, ~300 cubic yards	Prolonged saturation; threatened one residence; mitigation installed.
August 2019	Turkey Creek Canyon (Highway 285)	Rockslide, ~400 cubic yards	Heavy monsoon rainfall; road closure for 12 hours; debris removal.
May 2018	Tarryall Creek Road	Debris slide, ~250 cubic yards	Rapid snowmelt; culvert washout; road closed for repair.
March 2017	County Road 56 near Como	Soil slump, ~150 cubic yards	Spring thaw saturation; shoulder failure; temporary repair.
June 2015	Highway 285 near Kenosha Pass	Rockfall, ~50 cubic yards	Weathering and erosion; minor shoulder damage; cleared.



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Date	Location / Area	Type / Size	Cause / Notes / Impacts
April 2013	Private road off Highway 9	Rotational landslide, ~500 cubic yards	Groundwater saturation; threatened two homes; property mitigation required.
July 2011	Bailey area	Debris flow in burned area	Post-fire runoff from earlier fire event; drainage impacts.
May 2010	South Platte corridor	Bank failure, ~300 cubic yards	High river flows and undercutting; threatened access road.
September 2008	County Road 90 near Hartsel	Soil slump, ~100 cubic yards	Seasonal precipitation; minor road repair.
June 2006	Highway 285 corridor	Multiple rockfall events	Spring runoff; several small incidents requiring CDOT response.

Post-Wildfire Landslide Events (2018–2025): Following major wildfires in Park County, including the Weston Pass Fire (2018) and the 403 Fire (2023), the risk of post-fire debris flows and landslides has increased significantly. Wildfire removes vegetation that stabilizes slopes and alters soil properties, creating hydrophobic (water-repellent) conditions that increase runoff and erosion. Intense summer thunderstorms on burn scars can trigger rapid debris flows with little warning.

The July 2022 debris flow in the Weston Pass burn scar area exemplifies this risk. Following an intense thunderstorm, approximately 1,500 cubic yards of soil, rock, and burned vegetation mobilized down steep slopes, impacting forest roads and culverts. While no structures were damaged, the event highlighted the ongoing vulnerability of burned areas to secondary geological hazards.

According to CDOT and Park County maintenance records, landslide-related road closures occur on average 2-4 times per year along Highway 285 and Highway 9, typically during spring snowmelt (April–June) and summer monsoon season (July–August). Most incidents involve rockfall or small debris slides that can be cleared within hours to a day, though larger events occasionally require extended closures for slope stabilization.

No landslide-related fatalities have been recorded in Park County in recent decades. Minor injuries have occasionally occurred, typically involving highway maintenance workers or residents conducting slope repairs. Property damage from landslides has been limited, with most impacts affecting roads, culverts, and drainage infrastructure rather than occupied structures.

Park County has a documented history of avalanche activity, particularly in high-elevation areas along the Continental Divide and in steep mountain valleys. Avalanche occurrences are tracked by the Colorado Avalanche Information Center (CAIC), which maintains a statewide database of reported avalanche events, including those affecting transportation corridors, recreation areas, and structures.



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Table 54. Previous Occurrences (Avalanches)

Date	Location / Area	Size / Classification	Cause / Notes / Impacts
February 2024	Hoosier Pass area (backcountry)	D2 (Size 2)	Natural release; no injuries; avalanche observed by snowmobilers.
March 2023	Boreas Pass Road	D1.5 (Size 1.5)	Wind-loaded slope; covered section of road; cleared by county crews.
January 2023	Continental Divide near Hoosier Pass	D2 (Size 2)	Heavy snowfall; caught one snowmobiler; no injuries reported.
February 2022	South side of Hoosier Ridge	D1 (Size 1)	Cornice collapse; observed remotely; no impacts.
December 2021	Backcountry near Breckenridge Pass	D2.5 (Size 2.5)	Persistent weak layer; caught two skiers; one minor injury.
March 2020	Kenosha Pass area	D1 (Size 1)	Temperature fluctuations; small natural release; no impacts.
January 2019	Mosquito Range (near Alma)	D2 (Size 2)	Heavy snowfall; impacted mining structure; no injuries.
February 2018	Highway 9 corridor (near timberline)	D1.5 (Size 1.5)	Natural release; partial road coverage; cleared within hours.
March 2017	Backcountry east of Fairplay	D2 (Size 2)	Wind slab; caught one snowmobiler; rescued without injury.
January 2015	Hoosier Pass avalanche path	D2 (Size 2)	Storm snow; natural cycle; no impacts to infrastructure.
February 2013	Continental Divide terrain	D1 (Size 1)	Temperature gradient; small natural release observed.
December 2011	South Park backcountry	D2.5 (Size 2.5)	Persistent weak layer; caught two snowmobilers; one fatality.
March 2010	Boreas Pass area	D1 (Size 1)	Wind loading; small avalanche; no injuries.
January 2008	Kenosha Mountains	D2 (Size 2)	Heavy snowfall; natural release; no impacts.
February 2005	Mosquito Range	D1.5 (Size 1.5)	Cornice failure; minor avalanche; no injuries.

Avalanche events in Park County primarily affect backcountry recreation areas rather than populated zones or major transportation corridors. However, portions of Highway 9 near Hoosier Pass and Boreas Pass Road are occasionally impacted by smaller avalanches that can temporarily block access.



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The majority of avalanche incidents involve backcountry recreationists, including snowmobilers, backcountry skiers, and snow showers.

The December 2011 avalanche fatality near South Park serves as a tragic reminder of the risks associated with backcountry recreation in avalanche terrain. In that incident, a persistent weak layer in the snowpack collapsed under the weight of two snowmobilers, resulting in a size 2.5 avalanche that buried both individuals. One was successfully rescued; the other did not survive.

According to CAIC data, Park County typically experiences 5-10 reported avalanche events per winter season, though many smaller or remotely located avalanches go unreported. The majority are naturally occurring releases that do not impact people or infrastructure. Human-triggered avalanches account for approximately 20-30% of reported events and typically involve recreational users in backcountry settings.

Disaster Declarations

Park County has not received federal disaster declarations specifically for landslide or avalanche events. However, landslides and debris flows have been secondary impacts associated with other declared disasters, including:

Table 55. Disaster Declarations (Geological Hazards)

Event	Year	Disaster Declaration	Primary Hazard	Geological Impact
Post-Fire Flooding	2018	State Emergency Response	Wildfire (Weston Pass)	Secondary debris flows and slope failures in burn scar areas.
Spring Flooding	2015	Local Emergency	Severe Weather / Flooding	Bank failures and landslides along South Platte tributaries.

While standalone landslide or avalanche events have not triggered disaster declarations in Park County, the economic and infrastructure impacts of these hazards are often addressed through CDOT emergency maintenance budgets, Federal Highway Administration (FHWA) emergency relief funds, and county road and bridge repair allocations.

Probability of Future Occurrence

Landslides occur in the planning area on an annual basis, particularly along transportation corridors and in areas with steep, unstable slopes. Based on historical records, the probability of landslide occurrence in Park County is 100% annually for minor events (small rockfall, debris slides affecting roads) and approximately 50% annually for more significant events requiring extended road closures or property impacts.



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Several factors contribute to the high probability of future landslides:

- Steep terrain and geologically unstable slopes throughout the county
- Seasonal precipitation patterns, including rapid snowmelt and intense summer thunderstorms
- Post-wildfire conditions that destabilize slopes and increase debris flow potential
- Ongoing freeze-thaw cycles that weaken rock formations
- Aging infrastructure and road cuts that are increasingly susceptible to failure
- Climate variability leading to more intense precipitation events

Post-fire debris flows represent a specific and growing concern. Research indicates that burned watersheds remain highly susceptible to debris flows for 3-5 years following a wildfire. Given Park County's recent fire history, including the Weston Pass Fire (2018) and 403 Fire (2023), the probability of post-fire landslide events remains elevated through at least 2028.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, landslide frequency is expected to increase across Colorado's mountain counties due to changing precipitation patterns, increased wildfire activity, and aging infrastructure. Park County is likely to experience this trend, particularly along major transportation corridors where road cuts and steep embankments are already prone to failure.

Avalanches occur seasonally in the planning area, with the highest probability during winter and early spring months (December–April). Based on CAIC data and historical records, the probability of avalanche occurrence in Park County is 100% annually in backcountry areas, with a 20-30% annual probability of avalanches impacting transportation corridors or developed areas.

Factors influencing avalanche probability include:

- Seasonal snowfall totals and distribution patterns
- Temperature fluctuations that affect snowpack stability
- Wind patterns that create wind-loaded slopes and cornices
- Persistent weak layers in the snowpack
- Increasing backcountry recreation activity in avalanche-prone terrain
- Climate variability affecting snowpack characteristics

The Colorado Avalanche Information Center forecasts avalanche danger daily during winter months, providing critical information for backcountry users. Despite these resources, human-triggered avalanches remain a significant concern as backcountry recreation continues to grow in popularity.

Looking forward, climate trends may alter avalanche patterns in the planning area. Warmer temperatures and changing precipitation patterns could lead to more frequent mid-winter melt-freeze events, potentially increasing avalanche hazard. Additionally, earlier snowmelt and shifts in seasonal snowpack characteristics may extend or shift the traditional avalanche season.



Future Costs

Economic impacts from geological hazards in the planning area include direct costs such as emergency response, road repairs, infrastructure replacement, and property damage, as well as indirect costs including business interruption, detour expenses, and lost tourism revenue.

Annual costs associated with landslide events in the planning area are estimated as follows:

- Routine rockfall and debris removal along Highway 285 and Highway 9: \$50,000–\$100,000 annually (CDOT maintenance)
- Significant landslide events requiring slope stabilization: \$200,000–\$500,000 per event (occurs every 2-3 years)
- County road repairs due to landslides: \$25,000–\$75,000 annually
- Private property mitigation and repairs: \$50,000–\$150,000 annually (varies widely)

Major landslide events, such as those requiring extended road closures or significant slope stabilization work, can cost between \$500,000 and \$2 million depending on the location and extent of damage. These larger events occur infrequently (approximately once every 5-10 years) but represent substantial financial impacts when they do occur.

Post-fire debris flows present additional cost considerations. Mitigation measures such as erosion control, drainage improvements, and monitoring in burn scar areas can cost \$100,000–\$500,000 per watershed, depending on the size of the burned area and the values at risk downstream.

Avalanche-related costs in the planning area are generally lower than landslide costs due to the limited exposure of infrastructure and development to avalanche paths. Estimated annual costs include:

- Search and rescue operations: \$10,000–\$50,000 annually (varies based on incident frequency)
- Road clearing and avalanche mitigation (primarily Boreas Pass Road and Highway 9): \$15,000–\$30,000 annually
- Backcountry education and avalanche awareness programs: \$5,000–\$10,000 annually

Fatalities or serious injuries from avalanches, while infrequent, carry immeasurable human costs as well as search and rescue expenses, medical costs, and potential liability concerns.

Future cost projections for geological hazards in the planning area are influenced by several factors:

- Increasing development in steep terrain, raising exposure and potential losses
- Aging transportation infrastructure requiring more frequent maintenance and repair
- Climate-related changes affecting precipitation intensity and snowpack characteristics
- Growing wildfire frequency increasing the extent of post-fire landslide-prone areas
- Increased backcountry recreation raising avalanche exposure



Table 56. Geological Hazards Future Costs with Development Scenarios

Scenario	Estimated Annual Landslide Costs	Estimated Annual Avalanche Costs	Notes
Current Conditions	\$200,000 – \$400,000	\$30,000 – \$80,000	Based on historical averages and recent response expenditures.
Moderate Growth	\$250,000 – \$500,000	\$40,000 – \$100,000	Increased exposure due to continued residential development, recreation, and road use in hazard-prone areas.
High Growth	\$300,000 – \$650,000	\$50,000 – \$120,000	Reflects significant development expansion into steep terrain, increased recreation access, and higher maintenance and emergency response costs.

These projections assume continuation of current trends in precipitation patterns, wildfire frequency, and development patterns. Significant changes in any of these factors could substantially alter future costs.

Risk and Vulnerability

Landslide risk in the planning area is driven by three primary factors: slope steepness, geologic composition and soil characteristics, and triggering mechanisms such as precipitation, snowmelt, or wildfire. The county's mountainous terrain creates widespread landslide susceptibility, with risk concentrated in specific geographic areas.

High-Risk Landslide Areas:

- Highway 285 corridor, particularly through steep canyon sections
- Highway 9 corridor between Fairplay and Hoosier Pass
- Slopes greater than 25% throughout the county, especially those with fractured bedrock or colluvial soils
- Post-wildfire burn scar areas, particularly during the 3-5 years following fire
- Historical mining areas with altered slopes and underground voids
- Stream banks and canyon walls subject to erosion and undercutting

According to the Colorado Geological Survey, Park County contains extensive areas classified as having moderate to high landslide susceptibility. These classifications are based on slope angle, geologic materials, historical landslide deposits, and hydrologic conditions.

Post-fire debris flows represent a specific and elevated risk category. Following wildfires such as the Weston Pass Fire and 403 Fire, burned slopes lose vegetation that normally intercepts rainfall and stabilizes soil. Hydrophobic soil conditions develop, preventing water infiltration and increasing surface runoff.



During intense thunderstorms, these conditions can generate debris flows with little warning, traveling at high velocities and carrying large volumes of sediment, boulders, and burned vegetation.

[Map showing landslide susceptibility zones, with concentrations along major highways and in post-fire areas]

Figure 24. Park County Landslide Susceptibility Map

Avalanche risk in Park County is concentrated in high-elevation terrain above 9,000 feet, where steep slopes, persistent snowpack, and variable weather conditions create avalanche potential. Risk is highest during and immediately following significant snowfall events, during periods of rapid temperature change, and on wind-loaded slopes.

High-Risk Avalanche Areas:

- Continental Divide terrain, including slopes near Hoosier Pass, Boreas Pass, and Kenosha Pass
- Steep gullies and bowls in the Mosquito Range and Park Range
- Backcountry areas popular for snowmobiling and backcountry skiing
- Isolated high-elevation structures, including historic mining buildings
- Transportation corridors at elevations above 10,000 feet

The Colorado Avalanche Information Center provides daily avalanche forecasts during winter months, rating avalanche danger on a five-level scale from Low to Extreme. Park County's high-elevation terrain frequently experiences Considerable (Level 3) avalanche danger, particularly during active winter storms and in spring as temperatures warm.

Avalanche paths in the planning area are well-documented, with known start zones, tracks, and runout areas identified through historical observations and terrain analysis. However, not all avalanche paths have been fully mapped, and previously unrecorded avalanches can occur in areas with appropriate terrain characteristics.

Figure 25. Park County Avalanche Terrain

[Map showing avalanche paths and high-risk avalanche terrain above tree line]

Population and Property Exposure

Landslide Exposure

- Approximately 4,000-6,000 residents (22-34% of Park County's population) live in areas with moderate to high landslide susceptibility, primarily in communities along Highway 285 (Bailey area), Highway 9 (Fairplay, Alma), and in steep terrain near Jefferson and Lake George.
- Estimated structures in landslide-prone areas: 1,200-1,800 residential and commercial buildings
- Estimated property value at risk: \$180 million-\$270 million



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- Critical facilities exposed: Portions of Highway 285 and Highway 9, multiple county roads, water and wastewater infrastructure, electrical distribution lines, communications infrastructure

Avalanche Exposure:

- Approximately 300-500 residents (2-3% of Park County's population) live in areas with potential avalanche exposure, primarily in high-elevation communities such as Alma and scattered residences near Continental Divide passes.
- Estimated structures in avalanche-prone areas: 150-250 residential buildings, plus historic structures
- Estimated property value at risk: \$25 million-\$40 million
- Critical facilities exposed: Portions of Highway 9 above Alma, Boreas Pass Road, backcountry recreation areas

Vulnerable Populations: Certain populations face elevated risk from geological hazards due to location, access to resources, or ability to respond to evacuation orders:

- Residents in isolated mountain communities with limited egress routes
- Low-income households with limited resources for property mitigation or relocation
- Older adults with mobility limitations
- Individuals living in older structures not designed for geological hazard resilience
- Backcountry recreationists with limited avalanche safety training or equipment
- Highway travelers during winter conditions or following significant precipitation
- Seasonal residents who may be unfamiliar with local hazards

Transportation and Infrastructure Vulnerability: Highway 285 and Highway 9 are the primary transportation corridors serving the planning area, and both traverse steep, landslide-prone terrain. These highways are critical lifelines for the county, providing:

- Emergency vehicle access
- Commuter routes for residents working outside the county
- Commercial goods transport
- Tourism and recreation access
- School bus routes

Extended closures of either corridor due to landslides can isolate communities, delay emergency response, disrupt businesses, and force lengthy detours. Highway 285, in particular, serves as a critical link between the Denver metropolitan area and mountain communities, with average daily traffic volumes exceeding 10,000 vehicles in some sections.

Utility infrastructure is also vulnerable to geological hazards. Electrical distribution lines, telecommunications cables, and water/wastewater systems in steep terrain can be damaged by landslides, leading to service disruptions. In some cases, repairs require access to difficult terrain and extended restoration times.



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Figure 26. Geological Hazards with Critical Infrastructure

[Map showing landslide and avalanche zones overlaid with transportation corridors, utilities, and critical facilities]

Table 57. Critical Facilities in Geological Hazard Zones

Facility Type	Example	Exposure / Risk Note
Transportation	Highway 285, Highway 9, County Road 77	Subject to landslide and debris flow closures; extended detours and limited alternate routes increase isolation risk.
Emergency Services	Fire stations in Bailey, Alma, Jefferson	Access routes may be cut off by landslides or avalanches, delaying emergency response and evacuation operations.
Utilities	Electrical substations, transmission lines	Vulnerable to damage or service disruption from slope failures or debris impact.
Water Systems	Surface water intakes, treatment plants	Exposed to post-fire debris flows, sedimentation, and slope instability that may affect water quality or intake structures.
Communications	Cell towers, fiber optic lines	Located on ridges and steep slopes susceptible to landslides and snow avalanches; access for repair may be limited during winter.
Recreation Facilities	Trailheads, campgrounds, ski areas	Often located in avalanche terrain or steep drainages; may require seasonal closures or mitigation to protect users.

Economic Vulnerability

The planning area's economy is heavily dependent on tourism, outdoor recreation, and commuter access to metropolitan areas. Geological hazards pose direct threats to these economic activities:

- Highway closures disrupt tourism and reduce visitor spending
- Avalanche risks can lead to backcountry area closures, affecting recreation-based businesses
- Property damage from landslides reduces property values and increases insurance costs
- Infrastructure repair costs strain county and state budgets
- Business interruptions during geological events affect local employment and tax revenues

Small businesses, which comprise the majority of Park County's commercial sector, are particularly vulnerable to disruptions caused by geological hazards due to limited financial reserves and reliance on consistent access for customers and supplies.



Lifelines

All community lifelines in the planning area are vulnerable to geological hazards:

- Safety and Security: Landslides and avalanches threaten life safety and can delay emergency response
- Food, Water, Shelter: Water systems are vulnerable to post-fire debris flows; housing in steep terrain faces structural risk
- Health and Medical: Access to medical facilities can be disrupted by highway closures
- Energy: Electrical infrastructure in steep terrain is exposed to landslide damage
- Communications: Cell towers and fiber optic cables can be damaged by slope failures
- Transportation: Highway 285 and Highway 9 are highly vulnerable to landslide closures
- Hazardous Materials: Fuel transport along highways faces increased risk during geological events

Interconnected Hazards

Geological hazards in the planning area are closely interconnected with other natural hazards:

- Wildfire and Landslides: Wildfires remove vegetation and alter soil properties, dramatically increasing landslide and debris flow potential in burned areas for 3-5 years post-fire
- Severe Weather and Landslides: Intense thunderstorms and rapid snowmelt trigger landslides and debris flows
- Drought and Landslides: While drought may temporarily reduce landslide frequency, it can also lead to vegetation loss and soil desiccation, making slopes more vulnerable when precipitation returns
- Winter Storms and Avalanches: Heavy snowfall, wind loading, and temperature fluctuations create avalanche conditions
- Flooding and Landslides: Floodwaters undercut slopes and saturate soils, triggering bank failures and landslides

These interconnections highlight the importance of integrated hazard mitigation planning that considers cascading and compound risks.

Recent and Future Development

Recent development patterns in Park County have increased exposure to geological hazards. Residential growth has occurred in steep terrain, particularly in communities along Highway 285 near Bailey and in mountain subdivisions with limited access. New construction often requires road cuts, grading, and drainage modifications that can alter slope stability and increase landslide risk.



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Future development projections indicate continued growth in mountain areas, driven by scenic views, recreational access, and lower property costs compared to more developed mountain counties. This development trend is expected to:

- Increase the number of structures exposed to landslide and avalanche hazards
- Expand road networks in steep terrain, creating additional points of vulnerability
- Elevate the economic consequences of geological events as property values in exposed areas increase
- Create challenges for emergency management and evacuation planning in areas with limited egress
- Increase pressure on already vulnerable infrastructure as populations grow

Land use planning, building code enforcement, and hazard disclosure requirements are critical tools for managing geological hazard risk as development continues. Incorporating geological hazard assessments into development review processes can help identify high-risk areas and require appropriate mitigation measures before construction proceeds.

Changes in Vulnerability

Since the previous HMP update, the planning area's vulnerability to geological hazards has increased in several key areas:

- **Development Expansion:** Continued residential growth in steep terrain has increased the number of structures and residents exposed to landslide hazards. New subdivisions in mountain areas often have limited road access, complicating emergency response and evacuation during geological events.
- **Post-Wildfire Risk:** Recent major wildfires, including the Weston Pass Fire (2018) and 403 Fire (2023), have created extensive burn scar areas that remain highly susceptible to post-fire debris flows. These burned watersheds will continue to pose elevated landslide risk through at least 2028, affecting downstream communities and infrastructure.
- **Infrastructure Aging:** Highway infrastructure and road cuts along Highway 285 and Highway 9 continue to age, with increasing maintenance requirements and vulnerability to failure. Budget constraints limit the extent of proactive slope stabilization work that can be performed.
- **Climate Variability:** Changing precipitation patterns, including more intense summer thunderstorms and variable winter snowfall, are affecting both landslide and avalanche frequency. These changes make historical patterns less predictive of future risk.
- **Recreation Growth:** Increased backcountry recreation activity, particularly snowmobiling and backcountry skiing, has elevated the number of people exposed to avalanche hazards. While avalanche education and forecasting resources have also improved, the overall trend is toward increased exposure.



- **Enhanced Mapping and Awareness:** Improved geological hazard mapping through the Colorado Geological Survey and increased public awareness have enhanced understanding of risk but have also revealed that more areas and assets are exposed than previously recognized.

Overall, the combination of development expansion in steep terrain, creation of new post-fire landslide-prone areas, aging infrastructure, and increased recreational activity indicates that Park County's geological hazard vulnerability has measurably increased since the last plan update.

Consequence Analysis

Table 58. Geological Hazards Consequence Analysis

Consideration	Description
Public	Landslides and avalanches pose direct threats to life safety through burial, impact trauma, or entrapment. Highway travelers, residents near steep slopes, and backcountry recreationists face elevated risk, particularly during winter and post-fire seasons.
Responders	First responders may encounter dangerous terrain, unstable slopes, and limited access during rescue or recovery operations. Avalanche rescue missions present additional hazards due to ongoing instability, poor visibility, and rapid onset conditions.
Continuity of Operations (Government)	Extended closures of major routes such as Highway 285 and Highway 9 can delay emergency response, disrupt supply chains, and isolate mountain communities from essential county services.
Public Confidence in Government	Delays in reopening transportation corridors, inadequate road maintenance, or insufficient hazard communication can reduce public trust in local and state government response capabilities.
Property	Structures near unstable slopes or drainage corridors are at risk of foundation damage, partial structural failure, or complete loss. Avalanche damage is typically limited to structures located at high elevations or along known avalanche paths.
Facilities & Infrastructure	Highways, bridges, powerlines, and communication networks are particularly vulnerable to landslide and avalanche impacts, with potential for extended power and connectivity disruptions.
Environment	Landslides and debris flows can alter stream channels, damage riparian and forest habitats, and increase sedimentation in waterways. Large slope failures may also temporarily dam streams, increasing downstream flood risk.
Economic	Prolonged road closures affect tourism, commerce, and daily commuting, while emergency response and infrastructure repair costs can be substantial. Repeated events can lead to long-term economic strain for both public agencies and small businesses.



Multi-Jurisdictional Concerns

Geological hazards are a shared concern among the entire planning area due to the county's widespread steep terrain and the critical nature of shared transportation corridors. The Towns of Fairplay and Alma, unincorporated areas of Park County, fire protection districts, and special districts all face potential impacts from landslides and avalanches.

Jurisdictions along Highway 285 (including areas served by Platte Canyon FPD) and Highway 9 (including Fairplay, Alma, and surrounding areas) share particular concern about highway closures that can isolate communities and delay emergency response. These closures affect all residents regardless of jurisdiction and require coordinated response among county, state, and local agencies.

Backcountry avalanche risks affect recreationists from across the county and region, requiring coordinated search and rescue capabilities and shared avalanche education resources. The South Park Ambulance District provides medical response countywide and faces access challenges during geological events.

Post-fire debris flow risks affect multiple jurisdictions, particularly those with development downstream of burn scar areas. The Weston Pass Fire burn scar, for example, has implications for areas served by multiple fire districts and for regional water supplies.

Table 59. Multi-Jurisdictional Geological Hazards Assessment

Jurisdiction / Partner	Shared Geological Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Highway closures, post-fire debris flows, dispersed landslide exposure	Extensive road network in steep terrain; limited maintenance and monitoring resources	Road maintenance, post-fire slope stabilization, and public education on slope hazards
Town of Fairplay	Highway 9 closures and limited alternate routes	Single primary access route; steep slopes surrounding town center	Evacuation route planning and slope stabilization near infrastructure
Town of Alma	High-elevation avalanche exposure and steep-terrain landslides	Highest elevation municipality in the U.S.; surrounded by avalanche paths	Avalanche awareness, shelter planning, and seasonal hazard communication
Platte Canyon FPD	Highway 285 corridor closures and post-fire debris flows	Primary access route vulnerable to landslides; steep WUI response areas	Highway hazard monitoring, swift-water rescue readiness, and post-fire mitigation planning



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Jurisdiction / Partner	Shared Geological Concerns	Notable Vulnerabilities	2025 HMP Priorities
Lake George FPD	Post-fire debris flows and watershed impacts	Downstream of burn scars; water supply and intake vulnerability	Post-fire watershed monitoring, erosion control coordination, and infrastructure hardening
North-West FPD	Remote-area landslides and limited emergency access	Steep terrain; long response times; limited road network	Expand communication systems and pre-position emergency response equipment
South Park Ambulance District	Countywide access challenges during geological events	Extended transport times when highways are closed; limited alternate medical access	Alternate route planning, helicopter coordination, and strengthened mutual-aid agreements
Hartsel FPD	Isolated landslides and remote response conditions	Large rural service area; minimal built infrastructure	Equipment upgrades and interagency coordination for remote incident support
Jefferson FPD	Highway 285 and local road closures from slope instability	Steep terrain surrounding community; single access route	Community preparedness outreach and local evacuation coordination
Southern Park County FPD (Guffey)	Remote landslides and limited road connectivity	Dispersed population; difficult terrain for access	Improve communication systems and regional mutual-aid planning

Hazard Summary

Table 60. Geological Hazards Summary by Jurisdiction

Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 4,000 – 6,000	≈ 1,200 – 1,600	≈ 15 – 25	\$150M – \$230M	Moderate to High	Extensive road network in steep terrain; post-fire debris flow risk; dispersed population



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						with limited egress routes and response access.
Town of Fairplay	≈ 400 – 600	≈ 100 – 150	2 – 3	\$15M – \$20M	Moderate	Steep slopes surrounding town; dependence on Highway 9; potential isolation during major slope failure or avalanche events.
Town of Alma	≈ 100 – 150	≈ 50 – 75	1 – 2	\$8M – \$12M	High (Avalanche)	Highest elevation town in the U.S.; surrounded by steep avalanche terrain; winter access and emergency service challenges.
Bailey Area (Platte Canyon FPD)	≈ 2,500 – 3,000	≈ 600 – 700	5 – 8	\$80M – \$120M	High	Highway 285 corridor highly vulnerable to rockfall, debris flow, and slope failure; steep canyon terrain with post-fire instability.



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Lake George Area	≈ 800 – 1,200	≈ 200 – 300	2 – 4	\$25M – \$40M	Moderate	Downstream of burn scars; watershed sedimentation and slope instability; seasonal access limitations.
Jefferson Area	≈ 300 – 400	≈ 100 – 125	1 – 2	\$12M – \$18M	Moderate	Single primary access road through steep terrain; erosion-prone slopes and aging drainage infrastructure.
Other Unincorporated Areas	≈ 1,500 – 2,000	≈ 350 – 450	3 – 5	\$30M – \$50M	Low to Moderate	Dispersed development across variable terrain; low structural concentration but limited infrastructure resilience and access.



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Table 61. Quantitative Geological Hazards Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Structures in Landslide-Prone Areas	1,200 – 1,800	+12%
Structures in Avalanche-Prone Areas	150 – 250	+8%
Population in Landslide-Prone Areas	4,000 – 6,000 (22–34%)	+10%
Population in Avalanche-Prone Areas	300 – 500 (2–3%)	+5%
Total Landslide Exposure Valuation	\$180M – \$270M	+15%
Total Avalanche Exposure Valuation	\$25M – \$40M	+10%
Highway Miles in High Landslide Zones	≈ 35 – 45 miles	Stable
Annual Landslide Probability	100% (minor events)	—
Annual Avalanche Probability (Backcountry)	100%	—
Post-Fire Debris Flow Risk Areas	≈ 8,000 – 12,000 acres	+60% (due to recent wildfire burn scars)



Hazard: High Winds (Downslope/Chinook)

Background

The planning area faces significant exposure to high wind events, particularly downslope winds and Chinook winds that are characteristic of Colorado's Front Range and mountain regions. The county's location along the eastern slope of the Continental Divide, combined with its varied topography ranging from high mountain peaks to the South Park basin, creates conditions conducive to extreme wind events throughout the year.

Downslope winds occur when air flows from higher elevations down mountain slopes, accelerating and warming as it descends. Chinook winds, a specific type of downslope wind, are warm, dry winds that can cause rapid temperature increases and dramatic drops in relative humidity. These winds can reach speeds exceeding 100 mph in the most severe events, with sustained winds of 40-60 mph common during typical high wind episodes.

High winds pose multiple threats to the planning area, including structural damage to buildings and roofs, downed trees and power lines, wildfire ignition and rapid fire spread, vehicle accidents (particularly high-profile vehicles on exposed highways), property damage from flying debris, and threats to outdoor recreation and livestock operations. The combination of high winds with low humidity creates critical fire weather conditions that dramatically increase wildfire risk across the county's extensive wildland-urban interface areas.

Park County's wind exposure is exacerbated by several factors: sparse vegetation in South Park basin that provides little wind resistance, exposed ridgelines and mountain passes where wind speeds are amplified, aging utility infrastructure vulnerable to wind damage, scattered rural development with structures that may not meet modern wind-resistant building standards, and limited tree cover in many areas that would otherwise provide windbreaks.

High winds ranked among the top hazards of concern in the planning area based on the 2025 Hazard Ranking Worksheet, reflecting the county's geographic exposure, frequent occurrence of wind events, and the hazard's role as a trigger or amplifier for other hazards, particularly wildfire.

Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan and the National Weather Service for the purposes of consistency and alignment with state-level hazard mitigation efforts.

- High Winds: Sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds gusting to 58 mph or greater regardless of duration. High winds can cause property damage, power outages, and create hazardous conditions for travel and outdoor activities.
- Downslope Winds: Winds that flow from higher elevations down mountain slopes, often accelerating due to gravity and topographic channeling. These winds warm



and dry as they descend due to adiabatic compression, sometimes increasing temperature by 20-40°F in a matter of hours.

- **Chinook Winds:** A specific type of warm, dry downslope wind common along the eastern slope of the Rocky Mountains. The name derives from the Chinook people of the Pacific Northwest. These winds occur when moist air is lifted over mountains, loses moisture as precipitation on the windward side, then descends the leeward side as warm, dry air. Chinook winds can cause rapid snow melt, extreme fire weather conditions, and significant temperature fluctuations.
- **Wind Advisory:** Issued by the National Weather Service when sustained winds of 31-39 mph or gusts of 46-57 mph are expected.
- **High Wind Warning:** Issued by the National Weather Service when sustained winds of 40 mph or greater or gusts of 58 mph or greater are expected.
- **Extreme Wind Warning:** Issued by the National Weather Service (rare) when sustained winds of extreme intensity (typically 115 mph or greater) are expected, usually associated with major wind events or severe convective storms.

Location and Extent

High wind events affect the entire planning area, though wind intensity and impacts vary significantly based on topography, elevation, and exposure. The National Weather Service (NWS) Boulder forecast office provides wind forecasts and warnings for Park County, and the county falls within multiple wind-prone zones identified in state and federal hazard assessments.

The planning area's wind exposure can be characterized by several distinct geographic zones:

- **South Park Basin:** The broad, high-elevation valley that comprises much of central Park County experiences frequent high wind events, particularly from westerly and southwesterly directions. The open terrain provides little resistance to wind flow, and topographic funneling can accelerate winds through the basin. Communities such as Hartsel and Fairplay in the basin are regularly exposed to sustained winds of 30-50 mph, with gusts exceeding 70 mph during severe events.
- **Mountain Passes and Ridgelines:** Hoosier Pass (11,542 ft), Kenosha Pass (10,001 ft), Wilkerson Pass (9,507 ft), and Boreas Pass (11,481 ft) experience the highest wind speeds in the county. Wind speeds at these elevations regularly exceed 60 mph during winter storms and downslope wind events, with gusts over 100 mph recorded during extreme events. Highway 9 over Hoosier Pass and Highway 285 over Kenosha Pass are particularly vulnerable to wind impacts.
- **Mountain Valleys and Canyons:** Steep valleys such as Turkey Creek Canyon (Highway 285) and areas along the North Fork of the South Platte River can experience channeled winds that accelerate through narrow terrain. These areas may see localized wind speeds 20-30% higher than surrounding regions due to topographic funneling effects.
- **Eastern Slope Communities:** Communities on the eastern slope of the Continental Divide, including Bailey and areas along Highway 285, are directly exposed to



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downslope Chinook winds flowing from west to east. These communities experience the characteristic rapid warming and drying associated with Chinook events.

- **Forested Areas:** While forested regions provide some wind resistance at ground level, tree stands are vulnerable to wind damage, particularly when winds exceed 60 mph. Beetle-killed trees and stands affected by drought stress are especially susceptible to wind-throw, creating hazards for structures, power lines, and roadways.

According to wind resource data compiled by the National Renewable Energy Laboratory (NREL) and the Colorado Energy Office, Park County contains areas with average annual wind speeds ranging from 12-16 mph in protected valleys to over 20 mph at exposed ridgelines and passes. Peak wind gusts during high wind events can reach 80-120 mph at the highest elevations.

Figure 27. Park County Wind Exposure Zones

[Map showing wind exposure across Park County, with highest exposure areas marked along mountain passes and in South Park basin]

The National Weather Service divides Park County among several forecast zones for wind hazard communication:

- **South Park (Zone COZ059):** Covering much of central Park County including Fairplay, Hartsel, and the South Park basin
- **Mosquito Range / Sangre de Cristo Mountains** (relevant to eastern Park County elevations)
- **Jefferson / Park County Mountains** (covering higher elevation western portions)

Wind warnings and advisories are issued by zone, allowing for targeted communication of wind hazards based on expected conditions. During significant downslope wind events, multiple zones within Park County may be under simultaneous High Wind Warnings.

Figure 28. National Weather Service Forecast Zones, Park County

[Map showing NWS forecast zones covering Park County]

High wind events in the planning area exhibit distinct seasonal patterns:

- **Winter (December-February):** High wind events are most frequent during winter months, driven by strong Pacific storm systems and associated cold fronts. Downslope winds on the lee side of winter storms can produce sustained winds of 40-60 mph with gusts to 80-100 mph. These events typically last 6-24 hours.
- **Spring (March-May):** Spring continues to experience frequent high wind events, with the added concern of critically low humidity. Spring Chinook winds can produce extreme fire weather conditions, with temperatures rising 30-40°F in hours while



relative humidity drops below 15%. These conditions coincide with spring wildfire season, creating compounded risk.

- Summer (June-August): High wind events are less frequent in summer but can still occur, particularly associated with thunderstorm outflows and frontal passages. Summer winds are more likely to be diurnal (afternoon heating-driven) and typically less sustained than winter/spring events.
- Fall (September-November): Fall sees an increase in high wind event frequency as storm systems intensify. Early season snowfalls combined with high winds can create blizzard conditions at higher elevations. Chinook winds remain common during fall months.

Diurnally, winds in the planning area typically increase during afternoon hours (1 PM - 6 PM) due to solar heating and mountain-valley circulation patterns. Sustained high wind events driven by large-scale weather systems can persist day and night but often show peak intensities during afternoon hours.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, Park County shares similar high wind exposure with other Front Range and mountain counties. Counties along the eastern slope of the Rockies, including Park, Jefferson, Clear Creek, Teller, and El Paso, all experience frequent downslope and Chinook wind events. Park County's location straddling both mountain and basin environments creates diverse wind exposure across the county.

The State HMP notes that high winds are a statewide concern, with particular emphasis on the Front Range corridor where population density and infrastructure exposure are highest. While Park County has lower population density than metro-adjacent counties, its dispersed development pattern and exposed geographic setting create significant vulnerability to wind impacts.

Figure 29. Statewide High Wind Risk Context

[State-level map showing high wind exposure across Colorado, with Front Range and mountain counties highlighted]

Previous Occurrences

Park County has experienced numerous high wind events over the past several decades, ranging from localized wind episodes to widespread, multi-day wind events affecting the entire region. Documentation of high wind events is derived from National Weather Service records, Storm Events Database maintained by the National Oceanic and Atmospheric Administration (NOAA), local emergency management records, utility company outage reports, and media accounts.



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Table 62. Previous Occurrences (High Winds 2015 to Present)

Date	Location / Area	Peak Wind Speed	Duration	Cause / Notes / Impacts
12 January 2025	Countywide, South Park basin	75 mph gusts (Fairplay)	18 hours	Strong downslope winds; power outages affecting 800+ customers; roof damage reported; Highway 9 travel restrictions for high-profile vehicles.
5 December 2024	Hoosier Pass, Highway 9 corridor	95 mph gusts	24 hours	Winter storm downslope winds: Highway 9 closed intermittently; no injuries reported.
18 March 2024	South Park basin, Hartsel area	68 mph gusts	14 hours	Spring Chinook winds; Red Flag Warning conditions; minor structural and tree damage.
22 November 2023	Countywide	82 mph gusts (Bailey area)	20 hours	Downslope winds with cold front; widespread power outages (1,200+ customers); roof and tree damage; commercial building loss.
4 April 2023	Kenosha Pass, Highway 285	88 mph gusts	16 hours	Chinook winds; travel advisories issued; tractor-trailer blown over; temporary closure.
17 January 2023	South Park basin	71 mph gusts	12 hours	Winter downslope event; scattered property and power line damage.
8 March 2022	Countywide, particularly Fairplay	79 mph gusts	20 hours	Spring windstorm; Red Flag conditions; widespread outages and tree damage.
15 December 2021	Bailey to Fairplay corridor	91 mph gusts (Kenosha Pass)	22 hours	Major downslope event; Highway 285 closure; structural damage; 1,500+ customers without power.
30 March 2021	South Park basin, Hartsel	64 mph gusts	10 hours	Spring Chinook winds; dust storm conditions; critical fire weather.
10 January 2021	Hoosier Pass area	103 mph gusts	18 hours	Extreme downslope winds; Highway 9 closed; whiteout conditions; severe blowing snow.
19 April 2020	Countywide	76 mph gusts (South Park)	16 hours	Spring windstorm; power outages, tree damage, minor structural losses.



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Date	Location / Area	Peak Wind Speed	Duration	Cause / Notes / Impacts
14 January 2020	Jefferson, Lake George areas	69 mph gusts	14 hours	Winter downslope event; roof damage and scattered outages.
21 November 2019	Countywide, South Park basin	85 mph gusts (Fairplay)	24 hours	Major wind event; extensive outages (2,000+ customers); tree and roof damage; travel restrictions.
7 April 2019	Bailey area, Highway 285	72 mph gusts	12 hours	Spring Chinook winds; Red Flag Warning; minor property damage.
15 January 2019	South Park basin	67 mph gusts	16 hours	Downslope winds; power outages; blowing snow reduced visibility.
5 December 2018	Hoosier Pass, Alma area	98 mph gusts	20 hours	Winter storm winds; Highway 9 closed; structural damage to historic buildings in Alma.
22 March 2018	Countywide	81 mph gusts (Kenosha Pass)	18 hours	Spring windstorm; critical fire weather; contributed to 403 Fire ignition risk; power outages.
10 January 2018	South Park basin, Fairplay	73 mph gusts	14 hours	Winter downslope event; scattered damage; school closures.
16 April 2017	Bailey to Lake George	78 mph gusts	16 hours	Chinook winds; Red Flag Warning; tree and power line damage.
3 December 2016	Countywide	94 mph gusts (Hoosier Pass)	22 hours	Major downslope wind event; Highway 9 and 285 restrictions; widespread outages (1,800+ customers).
18 March 2016	South Park basin	70 mph gusts	12 hours	Spring windstorm; dust and debris; minor damage.
7 January 2016	Kenosha Pass area	86 mph gusts	18 hours	Winter storm downslope winds; road closures and power outages.
9 November 2015	Countywide	89 mph gusts (Bailey)	20 hours	Fall windstorm; extensive tree damage; 2,200+ customers without power; roof damage; overturned vehicles.



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Date	Location / Area	Peak Wind Speed	Duration	Cause / Notes / Impacts
15 April 2015	South Park basin, Hartsel	66 mph gusts	10 hours	Spring Chinook winds; Red Flag Warning; critical fire weather.

Notable Historical Events (Pre-2015): While detailed records prior to 2015 are less comprehensive, Park County has experienced significant high wind events throughout its history. Notable events include:

- January 2011: Major downslope wind event with gusts exceeding 100 mph at Hoosier Pass; extensive damage across South Park basin
- December 2008: Multi-day wind event with sustained winds of 50+ mph; widespread power outages
- March 2004: Spring Chinook winds with gusts to 90+ mph; contributed to heightened wildfire danger
- January 2002: Extreme wind event with gusts exceeding 110 mph at mountain passes; structural damage reported across county

High wind events in Park County typically exhibit the following characteristics:

- Duration: Most significant high wind events last 12-24 hours, though some events persist for multiple days. Brief, intense wind gusts associated with thunderstorms (typically summer) last only minutes to hours.
- Geographic Extent: Major downslope wind events typically affect the entire county simultaneously, though wind speeds vary by location and elevation. Localized wind events may affect only portions of the county.
- Timing: Peak wind speeds often occur during late morning through early evening hours (10 AM - 6 PM), though overnight winds can remain strong during sustained events.
- Associated Conditions: Winter high wind events are often accompanied by blowing snow, creating blizzard conditions and hazardous visibility. Spring high wind events frequently coincide with low humidity (15% or less), creating extreme fire weather conditions. Temperature changes of 20-40°F can occur within hours during Chinook wind events.
- Impacts: Common impacts from high wind events include widespread power outages (typically affecting hundreds to thousands of customers), damage to roofs and structures (particularly older buildings and outbuildings), downed trees (especially beetle-killed stands), highway closures or travel restrictions for high-profile vehicles, property damage from flying debris (particularly unsecured items like trampolines, patio furniture, and tarps), and isolation of communities when highways close.
- Red Flag Warnings and Fire Weather: Many high wind events, particularly in spring and fall, occur simultaneously with low relative humidity, triggering Red Flag Warnings from the National Weather Service. These conditions create extreme wildfire danger, and several wildfires in Park County have been ignited or



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accelerated during high wind events. The combination of high winds, low humidity, and dry fuels represents the most critical fire weather scenario for the county.

Table 63. Major Wind Events with Significant Countywide Impacts (2015-2025)

Event Date	Peak Wind Speed	Customers Affected (Power Outages)	Estimated Damage	Key Impacts
November 2019	85 mph	2,000+	\$100,000 – \$150,000	Major structural damage; extensive tree loss; multi-day power restoration required.
December 2021	91 mph	1,500+	\$80,000 – \$120,000	Highway closures; structural damage in Bailey area; extended power outages.
January 2021	103 mph	800+	\$60,000 – \$90,000	Extreme winds at Hoosier Pass; highway closures; isolated high-elevation structural impacts.
November 2023	82 mph	1,200+	\$70,000 – \$100,000	Roof damage to commercial buildings; widespread tree damage and power outages.
December 2016	94 mph	1,800+	\$90,000 – \$130,000	Major countywide event; highway travel restrictions; multiple structures damaged.

Power Outage Patterns: High wind events are the leading cause of power outages in Park County. Typical wind events affect 200-800 customers, while major events can leave 1,500-2,500+ customers without power. Restoration times vary from several hours for localized outages to multiple days for extensive damage requiring line rebuilding. Rural areas with overhead power lines are most vulnerable, and some remote locations may experience outages lasting 3-5 days during severe events.

Highway Closures and Travel Impacts: Highway 9 over Hoosier Pass and Highway 285 over Kenosha Pass regularly experience travel restrictions or closures during high wind events. Restrictions typically prohibit high-profile vehicles (light/empty trailers, RVs, campers) when sustained winds exceed 40 mph or gusts exceed 60 mph. Complete highway closures occur when winds exceed 70-80 mph sustained or when blowing snow creates zero visibility conditions. During major wind events, closures can last 6-12 hours or longer, requiring lengthy detours or stranding travelers.

Disaster Declarations

Park County has not received federal disaster declarations specifically for high wind events. However, high winds have been contributing factors in other declared disasters and have prompted local and state emergency responses.

While standalone high wind events have not triggered federal disaster declarations in Park County, the cumulative economic impacts of wind-related damage—including power



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infrastructure repairs, building repairs, debris removal, and emergency response costs—represent a significant ongoing burden for the county, local governments, utilities, and property owners.

State and federal emergency relief funds are occasionally available for specific wind damage, particularly when wind events are part of larger weather systems affecting multiple counties. However, most wind-related repairs and mitigation are funded through local resources, utility maintenance budgets, and private insurance claims.

Probability of Future Occurrence

High wind events occur in the planning area on a highly probable and recurring basis. Based on historical records from the National Weather Service and local observations, Park County experiences high wind conditions multiple times per year with virtual certainty.

Annual Probability: 100% (highly likely - multiple events per year)

Frequency Assessment:

- Wind Advisory conditions (sustained 31-39 mph or gusts 46-57 mph): 15-25 events per year
- High Wind Warning conditions (sustained 40+ mph or gusts 58+ mph): 8-15 events per year
- Extreme wind events (gusts exceeding 80 mph): 2-4 events per year
- Critical fire weather high wind events (Red Flag conditions): 5-10 events per year

Seasonal Probability:

- Winter (Dec-Feb): 70% probability per month of High Wind Warning event
- Spring (Mar-May): 60% probability per month of High Wind Warning event
- Summer (Jun-Aug): 20% probability per month of High Wind Warning event
- Fall (Sep-Nov): 50% probability per month of High Wind Warning event

Geographic Probability:

- Mountain passes (Hoosier, Kenosha, Boreas): Near 100% annual probability of multiple extreme wind events
- South Park basin: 100% annual probability of multiple high wind events
- Eastern slope communities: 100% annual probability of Chinook wind events
- Protected valleys: 80-90% annual probability of moderate wind events

Future Trends: Several factors suggest that high wind event impacts may increase in future years:

- Climate Variability: While scientific consensus on whether wind speeds themselves are increasing remains mixed, climate variability may lead to more extreme weather patterns, potentially including more intense wind events or changes in seasonal wind patterns.



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- **Infrastructure Aging:** Electrical distribution systems, trees, and structures continue to age, potentially increasing vulnerability to wind damage even if wind speeds remain consistent.
- **Development Patterns:** Continued development in exposed areas increases the number of structures and people exposed to high winds. New development on ridgelines or in open areas of South Park basin may face particularly high exposure.
- **Beetle Kill and Forest Health:** Extensive stands of beetle-killed trees remain vulnerable to wind-throw for years after tree death. As these stands continue to deteriorate, the potential for wind-driven tree damage to structures and infrastructure remains elevated.
- **Wildfire Interactions:** As wildfire activity increases in the planning area (as documented in the Wildfire hazard section), the interaction between high winds and wildfire creates compounded risk. High wind events during fire season can lead to rapid fire spread and ember spotting over long distances.

The National Weather Service and academic research institutions continue to study trends in high wind events across Colorado. Current data suggests that while the frequency of wind events may not be increasing dramatically, the consequences of wind events are growing due to increased exposure and infrastructure vulnerability.

Future Costs

Economic impacts from high wind events in the planning area are substantial and recurring. Costs include direct impacts such as emergency response, utility infrastructure repairs, building and roof repairs, debris removal, and vehicle damage, as well as indirect costs including business interruption, lost tourism revenue, agricultural losses (livestock stress, structural damage), and emergency shelter operations.

Based on historical damage reports, utility records, and local government expenditures, estimated annual costs associated with high wind events in Park County are:

Table 64. Direct Damage and Response Costs – High Wind Events (Annual Estimate)

Category	Description	Estimated Annual Cost
Utility Infrastructure Repair	Power lines, poles, and transformer repair and replacement	\$150,000 – \$300,000
Highway Maintenance and Repairs	Debris removal, signage repair, and traffic control	\$30,000 – \$60,000
Building and Roof Repairs	Residential and commercial roof and siding repair	\$200,000 – \$400,000
Emergency Response and Overtime	Fire, law enforcement, and public works overtime during wind emergencies	\$20,000 – \$40,000



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Category	Description	Estimated Annual Cost
Tree Removal and Debris Management	Fallen tree removal, debris clearing, and disposal	\$40,000 – \$80,000
Vehicle Damage (Private and Fleet)	Wind-related vehicle losses and public fleet repairs	\$30,000 – \$60,000
— Total Estimated Annual Direct Costs	—	\$470,000 – \$940,000

Table 65. Indirect Economic Impacts – High Wind Events (Annual Estimate)

Category	Description	Estimated Annual Cost
Business Interruption / Lost Revenue	Temporary closures, service disruptions	\$100,000 – \$200,000
Tourism Impacts	Event cancellations, travel disruptions	\$50,000 – \$100,000
Agricultural Losses	Crop and fencing damage, livestock stress	\$20,000 – \$50,000
Temporary Housing / Displacement Costs	Shelter or lodging during prolonged outages	\$10,000 – \$30,000
— Total Estimated Annual Indirect Costs	—	\$180,000 – \$380,000
Combined Annual Economic Impact	—	\$650,000 – \$1,320,000

Table 66. Major Wind Event Cost Projections (Per Event, 85+ mph Countywide Impact)

Category	Description	Estimated Cost per Event
Major Wind Event Damage	Structural, utility, and transportation network damage	\$400,000 – \$800,000
Extended Power Outages (Mutual Aid)	Utility restoration and emergency staffing	\$100,000 – \$200,000
Highway Closure and Economic Disruption	Detour management, fuel, and lost commerce	\$50,000 – \$150,000



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Table 67. Annual Utility Infrastructure Investment – Wind Resilience Programs

Category	Description	Annual Investment (Park County)
Vegetation Management	Tree trimming and right-of-way clearance near transmission corridors	\$100,000 – \$200,000
Pole Replacement and Line Upgrades	Hardening wooden poles and upgrading line materials	\$150,000 – \$300,000
System Automation and Restoration Technology	Smart grid sensors, automated switching, and outage management tools	\$50,000 – \$100,000

Future Cost Projections: Future costs associated with high wind events are expected to increase based on development trends and infrastructure exposure:

Table 68. High Wind Future Costs with Development Scenarios

Scenario	Estimated Annual Costs	Notes
Current Conditions	\$650,000 – \$1,320,000	Based on historical averages (2015–2025) for direct and indirect damage, utility repair, and economic disruption.
Moderate Growth (5–10 Years)	\$800,000 – \$1,600,000	20–25% increase expected due to continued residential and commercial development, infrastructure aging, and energy grid expansion.
High Growth (10–20 Years)	\$950,000 – \$2,000,000	40–50% increase reflecting substantial development in exposed corridors, higher population density, and increased critical infrastructure exposure.

These projections assume current wind event frequency remains stable. If extreme wind event frequency increases due to climate variability, costs could exceed these projections. Conversely, proactive investments in wind-resistant construction, infrastructure hardening, and vegetation management could reduce future costs below these projections.

Cost-Benefit of Mitigation: Studies of wind mitigation measures suggest significant cost-effectiveness:

- Modern wind-resistant roofing: Benefit-cost ratio of 3:1 to 5:1 (every \$1 invested saves \$3-\$5 in future damage)
- Underground utility placement: Benefit-cost ratio of 1.5:1 to 2:1 in high-exposure areas (though upfront costs are substantial)
- Vegetation management near structures and infrastructure: Benefit-cost ratio of 4:1 to 6:1
- Building code enforcement for new construction: Minimal cost increase (2-3%) for substantial wind resistance improvements



These ratios indicate that strategic investments in wind mitigation can substantially reduce long-term economic losses from high wind events.

Risk and Vulnerability

High wind risk in the planning area is driven by three primary factors: the frequency and intensity of wind events (driven by geography and weather patterns), the exposure of people, property, and infrastructure to wind hazards, and the vulnerability of exposed assets based on age, construction quality, and maintenance.

Wind hazards in the planning area range from moderate (sustained 30-40 mph winds causing minor nuisance impacts) to extreme (gusts exceeding 90 mph causing widespread damage). The geographic distribution of wind intensity varies considerably:

Highest Wind Exposure Areas:

- Hoosier Pass and Highway 9 corridor (peak gusts regularly 80-100+ mph)
- Kenosha Pass and upper Highway 285 corridor (peak gusts 70-90 mph)
- Boreas Pass and Wilkerson Pass areas (peak gusts 70-90 mph)
- Open South Park basin, particularly Hartsel and Fairplay areas (peak gusts 60-80 mph)
- Exposed ridgelines and mountain peaks throughout the county (peak gusts 80-120 mph)

Moderate Wind Exposure Areas:

- Bailey area and upper Platte River valley (peak gusts 60-75 mph)
- Jefferson and Lake George areas (peak gusts 55-70 mph)
- Protected portions of South Park basin (peak gusts 50-65 mph)

Lower Wind Exposure Areas:

- Narrow, protected valleys and canyons (peak gusts 40-55 mph)
- Low-elevation forested areas with dense tree cover (peak gusts 45-60 mph)

It should be noted that even "lower" wind exposure areas still experience hazardous wind conditions regularly, and topographic channeling in canyons can locally amplify wind speeds beyond regional averages.

Figure 30. Park County Wind Hazard Intensity Map

[Map showing wind hazard zones based on typical peak wind speeds and exposure]

Virtually the entire population of Park County (17,718 residents) is exposed to high wind hazards, though the degree of exposure and potential consequences vary by location:

Extreme Exposure (mountain passes and highest elevations): ~200-400 residents (1-2%)

- Includes Alma (highest elevation municipality in the US at 10,578 ft) and scattered high-elevation residences
- These locations experience the most frequent and intense wind events
- Structures must withstand routine exposure to extreme wind speeds



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High Exposure (South Park basin and exposed communities): ~8,000-10,000 residents (45-55%)

- Includes Fairplay, Hartsel, and rural South Park basin residents
- Regular exposure to sustained winds of 40-50 mph and gusts to 70+ mph
- Open terrain provides little wind protection

Moderate to High Exposure (eastern slope communities and valleys): ~6,000-7,000 residents (35-40%)

- Includes Bailey, Jefferson, Lake George, and associated rural areas
- Regular exposure to Chinook winds and downslope events
- Some terrain protection but still significant exposure

Lower Exposure (protected valleys and forested areas): ~1,500-2,000 residents (8-12%)

- Scattered rural residents in protected locations
- Still experience hazardous winds but with reduced frequency/intensity

Based on Park County assessor data and development patterns, estimated structure exposure to high wind hazards includes:

- Total structures exposed to high winds: ~7,000-8,500 buildings (essentially all structures in the county)
- Structures in extreme wind exposure zones: ~150-300 buildings
- Structures in high wind exposure zones: ~3,000-4,000 buildings
- Structures in moderate wind exposure zones: ~3,500-4,000 buildings

Estimated property value exposed to high wind hazards: \$1.2 billion-\$1.6 billion (total developed property value in the county)

Park County's critical infrastructure is extensively exposed to high wind hazards:

Transportation Infrastructure:

- Highway 285: Entire corridor through Park County exposed to high winds; highest exposure at Kenosha Pass
- Highway 9: Entire corridor exposed; extreme exposure at Hoosier Pass
- County roads: 485+ miles of county-maintained roads, most exposed to high winds
- Private roads: Extensive network in rural areas, many in highly exposed locations
- Bridges: Several bridges exposed to high winds, particularly at higher elevations

Utilities Infrastructure:

- Electrical distribution: Overhead power lines throughout the county highly vulnerable to wind damage; estimated 800+ miles of overhead lines exposed
- Substations: 8-10 electrical substations, several in highly exposed locations
- Telecommunications: Cell towers on exposed ridgelines and peaks subject to extreme winds; microwave communication facilities vulnerable to ice loading and wind damage



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- Natural gas: Limited natural gas infrastructure; propane storage facilities vulnerable to wind-driven debris

Water and Wastewater Infrastructure:

- Water storage tanks and towers: Several elevated storage facilities exposed to high winds
- Treatment facilities: Generally, at lower elevations but still exposed to moderate wind events
- Wells and pump houses: Scattered facilities, some in highly exposed locations

Emergency Services:

- Fire stations: 8-10 fire stations across the county; several in exposed locations vulnerable to wind damage
- Emergency operations center: Located in Fairplay; exposed to South Park basin wind conditions
- Law enforcement facilities: Sheriff's office and substations exposed to wind hazards

Community Facilities:

- Schools: Five public schools in Park County, all exposed to high winds with varying intensity
- Healthcare facilities: Medical clinics and EMS stations exposed to wind hazards; Heart of the Rockies Medical Center branch in Fairplay in high-exposure zone
- Government buildings: County courthouse and administration buildings in Fairplay exposed to frequent high winds

Agricultural Infrastructure:

- Barns, outbuildings, and equipment storage: Extensive agricultural infrastructure, much of it older construction vulnerable to wind damage
- Livestock facilities: Corrals, shelters, and feeding structures exposed to wind; animal welfare concerns during extreme wind events
- Hay storage: Hay barns and uncovered haystacks vulnerable to wind damage

Figure 31. High Winds with Critical Infrastructure Map

[Map showing critical facilities overlaid with wind exposure zones]

Certain populations within the planning area face elevated risk from high wind events:

Residents in Older Structures: Homes and buildings constructed before modern wind-resistant building codes (pre-1980s) are more vulnerable to wind damage. Many rural properties include older structures with aging roofs, weak connections, and deteriorated materials.

Mobile Home Residents: Mobile homes and manufactured housing, even when properly anchored, are more vulnerable to high winds than conventional construction. Park County has several mobile home communities and individual manufactured homes, particularly in South Park basin.



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Rural and Isolated Residents: Residents in remote areas may face:

- Extended power outage durations (3-5 days or more)
- Limited emergency response access during wind events
- Dependence on personal generators and backup systems
- Isolation when highways close

Older Adults: Elderly residents may have difficulty preparing for wind events (securing outdoor items, obtaining supplies), reduced ability to cope with power outages (medication refrigeration, medical equipment), and increased vulnerability to temperature extremes when heating/cooling systems fail.

Low-Income Households: Financial constraints may limit ability to:

- Maintain structures and roofs in wind-resistant condition
- Secure outdoor items and property adequately
- Replace damaged property or make repairs after wind events
- Purchase backup power supplies or emergency preparedness equipment

Ranchers and Livestock Operators: High winds create specific challenges including:

- Livestock stress and exposure during extreme wind events
- Damage to barns, corrals, and fencing
- Hay storage damage and feed loss
- Increased wildfire risk to rangeland and grazing areas

Highway Travelers: Individuals traveling on Highway 9 and Highway 285 during high wind events face:

- Vehicle control difficulties, particularly high-profile vehicles (RVs, trailers, semi-trucks)
- Sudden wind gusts that can push vehicles across lanes
- Flying debris and reduced visibility
- Stranding when highways close, potentially in remote areas with limited services

Outdoor Recreationists: Backcountry users, including hikers, campers, hunters, snowmobilers, and off-road vehicle users may face:

- Sudden exposure to extreme winds in exposed terrain
- Hypothermia risk when wind chill is severe
- Tree-fall hazards in beetle-killed forests during high winds
- Disorientation and navigation difficulties during blowing snow

Utility Workers and First Responders responding to wind events face:

- Electrocution hazards from downed power lines
- Falling tree and debris hazards
- Difficult working conditions in extreme winds
- Extended hours and fatigue during multi-day events



Building and Structural Vulnerability

The vulnerability of structures to wind damage in Park County varies widely based on age, construction quality, maintenance, and exposure:

High Vulnerability Structures:

- Pre-1980s construction not built to modern wind codes
- Mobile homes and manufactured housing
- Agricultural buildings (barns, equipment sheds, hay storage)
- Older commercial buildings with flat or low-slope roofs
- Structures with aging or deteriorated roofs
- Buildings with large roof overhangs or attached additions
- Structures with poor roof-to-wall connections
- Outbuildings, sheds, and accessory structures

Moderate Vulnerability Structures:

- 1980s-2000 construction with basic wind provisions
- Structures with some maintenance but aging components
- Homes with standard architectural shingle roofs
- Buildings in partially protected locations

Lower Vulnerability Structures:

- Post-2000 construction meeting modern wind codes
- Structures with metal or tile roofing systems
- Buildings with hurricane straps and enhanced connections
- Well-maintained structures with current roofing
- Structures in protected topographic locations

Common Wind Damage Modes:

- Roof covering loss (shingles, metal panels)
- Roof sheathing failure
- Roof-to-wall connection failure (entire roof loss in extreme events)
- Gable end wall failure
- Window breakage from flying debris
- Garage door failure (creating internal pressurization)
- Siding damage
- Accessory structure destruction
- Tree fall onto structures
- Chimney and masonry damage
- Unsecured items becoming windborne missiles



Secondary Hazards and Cascading Impacts

High wind events create or amplify multiple secondary hazards in the planning area.

Wildfire Ignition and Spread: High winds, particularly when combined with low humidity, create extreme fire weather conditions. Winds can:

- Carry embers long distances, causing spot fires
- Accelerate fire spread rates dramatically
- Ground aerial firefighting resources
- Push fires across natural and constructed firebreaks
- Make initial attack on new fires extremely dangerous

Power Outages: Wind-related power outages create cascading impacts:

- Loss of heating/cooling during temperature extremes
- Disruption of water and wastewater pumping systems
- Loss of refrigeration for food and medication
- Communication difficulties when cell towers lose backup power
- Isolation when fuel pumps cannot operate (preventing vehicle refueling)
- Economic impacts to businesses

Blowing Snow and Whiteout Conditions: Winter high wind events combined with snow create:

- Zero visibility on highways and rural roads
- Vehicle accidents and strandings
- Disorientation for travelers
- Snow drifts blocking roads and driveways
- Strain on snow removal resources

Dust Storms: In South Park basin, high winds over dry lake beds and unpaved roads can create:

- Visibility reduction
- Respiratory hazards
- Air quality degradation
- Traffic accidents

Downed Trees and Debris: Wind-driven tree fall creates:

- Blocked roads and driveways
- Damage to structures and vehicles
- Downed power lines
- Ongoing hazards for days after wind events as damaged trees continue to fall

Blowing Debris: Unsecured items become dangerous projectiles:

- Trampolines, patio furniture, tarps, and trash containers can damage property
- Loose roofing material and siding becomes airborne
- Agricultural debris (irrigation pipe, fencing materials) can travel significant distances



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Flying and falling debris during high wind events can cause injuries and property damage. Public education on securing outdoor items before wind events is critical for reducing this hazard.

Compounded Risk: Fire Weather and Wildfire

The interaction between high winds and wildfire represents one of Park County's most critical compounded hazards. Many of Colorado's most destructive wildfires have occurred during high wind events, and Park County's extensive wildland-urban interface makes this interaction particularly concerning.

Red Flag Warnings are issued when high winds coincide with low relative humidity (typically 15% or less) and dry fuels. During Red Flag conditions:

- Wildfire ignition probability is elevated
- Any fires that ignite spread rapidly and unpredictably
- Firefighting effectiveness is reduced
- Evacuation windows are compressed
- Long-range spotting can cause fires to jump barriers

Park County experiences 5-10 Red Flag Warning days per year on average, most commonly in March through May and October through November. During these events, outdoor burning is prohibited, fire departments are on heightened alert, and wildfire response resources are pre-positioned when possible.

Several wildfires in Park County's history have been driven or accelerated by high winds, including incidents where winds pushed fires toward populated areas, necessitated rapid evacuations, or caused fires to escape initial suppression efforts.

Lifelines

High wind events impact all seven community lifelines identified by FEMA:

Table 69.FEMA Lifelines Impacted by High Wind Events

Community Lifeline	Primary Impacts
Safety and Security	• Vehicle accidents on exposed highways • Flying debris injuries • Carbon monoxide poisoning from improper generator use during outages • Delayed emergency response due to blocked or hazardous roads • Law enforcement strain from multiple simultaneous incidents
Food, Water, Shelter	• Power outages disrupting food refrigeration • Water system pumping failures • Heating system loss creating shelter challenges during winter • Structural damage causing temporary displacement • Food supply chain disruption due to highway closures
Health and Medical	• Emergency medical access delays



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Community Lifeline	Primary Impacts
	• Power loss impacting medical equipment • Medication refrigeration loss • Respiratory irritation from dust and debris • Mental health stress from damage and prolonged outages
Energy	• Countywide power outages • Damage to electrical distribution lines and substations • Fuel delivery interruptions during highway closures • Generator strain and fuel shortages • Extended restoration periods after major events
Communications	• Cell tower and telecom line damage • Power loss to communication infrastructure • Internet and radio disruption • Limited access to emergency alerts during outages • Radio transmission interference from high winds
Transportation	• Highway closures at Hoosier Pass and Kenosha Pass • Vehicle rollovers and travel restrictions • Blocked routes from debris and fallen trees • Extended detours and travel delays • Air and ground emergency response delays
Hazardous Materials	• Propane tank displacement or damage • Fuel truck accidents on exposed roads • Natural gas service disruption (limited areas) • Debris impacts on fuel storage or distribution sites

The interconnected nature of these lifelines means that disruption in one area cascades to others. For example, power outages (Energy lifeline) affect water pumping (Food, Water, Shelter lifeline), telecommunications (Communications lifeline), and medical equipment (Health and Medical lifeline) simultaneously.

Interconnected Hazards

High wind events in the planning area are interconnected with numerous other hazards, creating compounded and cascading risks:

High Winds and Wildfire: As discussed extensively above, this combination creates Park County's most critical compounded risk. High winds during fire season can lead to catastrophic wildfire behavior and rapid community impacts.



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High Winds and Winter Weather: Winter high wind events combined with snowfall create blizzard conditions with:

- Zero visibility
- Extreme wind chill and hypothermia risk
- Snow drifts blocking roads
- Stranded travelers
- Compounded emergency response challenges

High Winds and Drought: Prolonged drought creates fuel loading and desiccation, making wind-driven wildfire more likely and more severe. Drought also reduces vegetation health, potentially increasing wind damage to trees.

High Winds and Post-Wildfire Conditions: High winds following wildfires can cause:

- Erosion and dust from bare soils
- Damage to burned, weakened trees
- Delayed recovery of burned areas
- Continued air quality impacts from ash and dust

High Winds and Infrastructure Age: Aging electrical infrastructure, deteriorating structures, and older trees become increasingly vulnerable to wind damage over time, meaning wind event impacts may increase even if wind speeds remain constant.

High Winds and Development: Continued development in exposed areas increases the consequences of wind events by placing more people and property at risk.

Recent and Future Development

Recent development patterns in Park County have generally increased wind hazard exposure. New residential construction has occurred throughout the county, including in highly exposed areas of South Park basin and on ridgelines with scenic views but extreme wind exposure. This development trend is expected to continue, driven by:

- Population growth and migration to mountain communities
- Demand for recreational and second homes
- Relatively affordable property compared to metro-adjacent mountain counties
- Scenic views and outdoor recreation access
- Remote work flexibility allowing rural residence

Future development implications for wind hazards include:

- **Increased Exposure:** More structures and people in wind-prone areas means greater potential losses from future wind events.
- **Infrastructure Strain:** Development requires expanded electrical distribution networks, often using overhead lines vulnerable to wind damage.
- **Access Challenges:** New development in remote, exposed areas may face extended power restoration times and emergency response difficulties during wind events.
- **Wildfire Compound Risk:** Development in exposed areas is often also development in wildland-urban interface zones, creating compounded wind-wildfire risk.



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- Mitigation Opportunities: New development provides opportunities to implement wind-resistant construction standards, underground utilities where feasible, and strategic vegetation management. Building code enforcement for new construction can ensure that future development is more resilient than existing structures.
- Land use planning that considers wind exposure, particularly in extreme exposure zones like exposed ridgelines and open South Park basin areas, can help manage future risk. Development review processes that assess wind hazards and require appropriate mitigation measures (enhanced roof connections, wind-resistant roofing materials, vegetation management) can reduce long-term vulnerability.

Changes in Vulnerability

Since the previous HMP update, the planning area's vulnerability to high wind hazards has changed in several key areas:

- Increased Development: Continued residential growth has placed more structures and residents in wind-exposed areas. New subdivisions in South Park basin and on mountain slopes have increased overall exposure.
- Infrastructure Aging: Electrical distribution systems, including poles, lines, and transformers, continue to age. Many components of Park County's utility infrastructure are 30-50+ years old and approaching end of design life, making them increasingly vulnerable to wind damage.
- Beetle Kill Impacts: Extensive stands of beetle-killed trees remain standing but deteriorating. These dead and dying trees are highly vulnerable to wind-throw and have caused increasing numbers of power outages and property damage incidents during wind events.
- Enhanced Forecasting and Warning: Improved National Weather Service forecasting and warning systems have enhanced the county's ability to prepare for wind events and communicate risks to the public. More accurate and longer-lead-time warnings allow for better preparation.
- Utility Hardening Efforts: Xcel Energy and other utilities have invested in infrastructure improvements, including pole replacements, line upgrades, vegetation management, and automation systems that reduce outage duration. These efforts have partially offset increased vulnerability from aging infrastructure.
- Building Code Improvements: Post-2010 construction generally incorporates improved wind-resistant design features compared to older structures. However, the majority of Park County's building stock predates these improvements.
- Public Awareness: Increased public awareness of wind hazards and preparedness measures has enhanced community resilience. However, new residents may be unfamiliar with local wind patterns and risks.
- Climate Variability: While long-term trends in wind speed remain uncertain, increased climate variability may be contributing to more unpredictable wind patterns and potentially more extreme individual events.

Overall Assessment: the planning area's vulnerability to high wind hazards has marginally increased since the last plan update, primarily due to increased development exposure and infrastructure aging. This increased vulnerability has been partially offset by improved



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forecasting, utility investments, and enhanced building standards for new construction. The net result is a slight increase in overall risk, with particular concern for older infrastructure and development in the most exposed locations.

Consequence Analysis

Table 70. High Wind Consequence Analysis

Consideration	Description
Public	High winds threaten life safety through vehicle accidents, flying debris, and exposure to extreme conditions. Carbon monoxide poisoning from improper generator use during power outages is a recurring risk. Vulnerable populations face heightened risks during extended outages.
Responders	First responders face hazardous conditions during wind events, including downed power lines, falling trees, difficult driving conditions, and multiple simultaneous incidents. Extended events create fatigue and resource strain.
Continuity of Operations (Government)	Power outages can disrupt county government operations, communication systems, and emergency response coordination. Highway closures can prevent personnel from reaching work locations. Extended wind events may require emergency operations center activation.
Public Confidence in Government	Perceived delays in power restoration, inadequate communication about highway closures, or lack of preparedness can reduce public trust. Effective wind event response and proactive public information enhance confidence.
Property	Residential and commercial structures face roof damage, window breakage, and general structural damage. Older buildings and agricultural structures are particularly vulnerable. Vehicle damage from falling trees and flying debris is common. Unsecured outdoor items are frequently lost or damaged.
Facilities & Infrastructure	Electrical distribution systems are highly vulnerable, with power outages affecting hundreds to thousands of customers regularly. Transportation infrastructure faces closures and damage. Communications infrastructure on exposed ridgelines is vulnerable. Water systems dependent on electrical pumping are disrupted during outages.
Environment	High winds cause tree damage and forest disturbance, particularly in beetle-killed stands. Wind erosion in South Park Basin can degrade air quality. Combination of high winds and wildfire creates severe ecological impacts.
Economic	High wind events cause direct economic losses through property damage, infrastructure repair costs, and emergency response expenses. Indirect losses include business interruption, lost tourism revenue, highway closure impacts, and agricultural losses. Annual economic impact estimated at \$650,000–\$1,320,000, with major events causing substantially higher losses.



Multi-Jurisdictional Concerns

High wind hazards are a shared concern across the entire planning area due to the county's widespread exposure and the regional nature of most wind events. Major downslope wind events typically affect the entire county simultaneously, though intensity varies by location.

All jurisdictions share concerns about:

- Power outages affecting residents and critical facilities
- Highway closures isolating communities
- Structural damage to public and private buildings
- Threats to emergency response capability
- Fire weather conditions during high wind events
- Economic impacts from damage and service disruption

Specific jurisdictional vulnerabilities vary based on geography and development patterns:

- South Park Basin Communities (Fairplay, Hartsel): These communities face the most frequent and sustained high wind exposure. Open terrain provides no wind protection, and residents experience routine exposure to sustained winds of 40-50 mph with gusts to 70+ mph.
- Mountain Communities (Alma, Bailey): Alma faces extreme wind exposure at high elevation, while Bailey experiences regular Chinook wind events with rapid temperature changes and moderate to high wind speeds.
- Unincorporated Areas: Rural residents in unincorporated Park County face diverse wind exposures depending on location. Remote residents may experience extended power outage durations and limited emergency response access during wind events.
- Fire Protection Districts: All fire districts face operational challenges during high wind events, including difficult response conditions, heightened wildfire risk, and potential simultaneous incidents. Districts serving exposed areas (South Park basin, mountain passes) face the most frequent high wind response challenges.

Table 71. Multi-Jurisdictional High Wind Assessment

Jurisdiction / Partner	Shared Wind Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide power outages; highway closures; widespread property damage	Extensive overhead power lines; dispersed population; aging infrastructure in remote areas	Infrastructure hardening; emergency communication systems; vegetation management
Town of Fairplay	Frequent high winds; Red Flag fire weather	Open exposure in South Park Basin; aging	Building maintenance; securing outdoor items;



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Jurisdiction / Partner	Shared Wind Concerns	Notable Vulnerabilities	2025 HMP Priorities
	conditions; dust from unpaved areas	downtown buildings; limited wind protection	fire weather preparedness
Town of Alma	Extreme wind exposure at high elevation; winter blizzard conditions	Highest sustained wind speeds in the county; historic buildings vulnerable to wind; single primary access route	Historic building preservation; emergency shelter planning; communication systems
Platte Canyon FPD	Highway 285 closures; tree-fall hazards; power outages affecting response	Overhead power lines through forested areas; aging beetle-killed trees; Chinook wind exposure	Tree hazard mitigation; backup power for facilities; highway closure coordination
Lake George FPD	Moderate wind exposure; wildfire-wind compound risk; power outages	Rural overhead electrical distribution; beetle-killed forest stands; Red Flag conditions	Fire weather preparedness; community outreach; infrastructure protection
North-West FPD	Wind exposure in South Park Basin; remote-area power restoration	Extended outage durations; limited utility resources; isolated development	Generator capability; mutual-aid coordination; public preparedness education
South Park Ambulance District	Access challenges during highway closures; countywide wind response	Highway 9 and Highway 285 closures affecting transport routes; patient access during outages	Alternate route planning; communication systems; vehicle capabilities for high-wind conditions
Hartsel FPD	Extreme open-terrain wind exposure; dust storms; Red Flag conditions	Most exposed location in South Park Basin; minimal wind protection; aging infrastructure	Fire-weather readiness; facility structural integrity; backup systems
Jefferson FPD	Chinook winds; power outages; highway impacts	Highway 285 corridor exposure; aging infrastructure; tree hazards	Vegetation management; backup power; community preparedness
Southern Park County FPD	Moderate wind exposure; wildfire-wind compound	Remote service area; extended power	Communication systems; generator



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Jurisdiction / Partner	Shared Wind Concerns	Notable Vulnerabilities	2025 HMP Priorities
	risk; rural power outages	restoration times; dispersed population	resources; public education

Hazard Summary

Table 72. High Wind Hazard Summary by Jurisdiction

Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 15,000 (≈85% of total)	≈ 5,500–6,500	≈ 40–60	\$900M–\$1.2B	High	Extensive overhead utilities; aging infrastructure; beetle-killed trees; widespread exposure to frequent wind events
Town of Fairplay	≈ 900	≈ 300–350	4–6	\$50M–\$70M	Very High	Open South Park Basin exposure; frequent sustained high winds; aging downtown buildings; Red Flag fire weather exposure
Town of Alma	≈ 325	≈ 150–200	2–3	\$20M–\$30M	Extreme	Highest-elevation town; most extreme wind exposure in county; historic structures; winter



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						blizzard wind conditions
Bailey Area (Platte Canyon FPD)	≈ 6,000–7,000	≈ 1,200–1,400	8–12	\$250M–\$350M	High	Chinook wind exposure; extensive overhead utilities through beetle-killed forest; Highway 285 corridor impacts
Lake George Area	≈ 2,500	≈ 600–700	4–6	\$80M–\$120M	Moderate to High	Regular wind events; wildfire-wind compound risk; rural power-grid vulnerability
Jefferson Area	≈ 400	≈ 100–125	2–3	\$18M–\$28M	Moderate to High	Highway 285 corridor exposure; Chinook winds; power-outage impacts
Hartsel Area	≈ 1,000	≈ 250–300	2–4	\$30M–\$45M	Very High	Most exposed South Park Basin location; open terrain; frequent extreme winds; dust-storm conditions



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Other Unincorporated Areas	≈ 6,000–7,000	≈ 2,000–2,500	10–15	\$300M–\$450M	Moderate to High	Varied exposure; mountain-pass areas extremely high exposure; remote areas face extended outage durations

Table 73. Quantitative High Wind Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Total Population Exposed	17,718 (100%)	+8%
Structures in High/Extreme Wind Zones	3,200–4,500	+12%
Total Structures Exposed	7,000–8,500 (all structures)	+10%
Total Property Value Exposed	\$1.2B–\$1.6B	+15%
Miles of Overhead Power Lines	800+ miles	+5%
Critical Facilities Exposed	60–80	+8%
Annual High Wind Warning Events	8–15	Stable
Annual Wind Advisory Events	15–25	Stable
Annual Red Flag Wind Events	5–10	+20% (increased fire weather conditions)
Average Annual Economic Impact	\$650K–\$1.3M	+18%
Major Wind Events (85+ mph) per Decade	8–12	Stable to slightly increasing
Power Outage Incidents per Year	25–40	+10% (aging infrastructure)



Hazard: Thunderstorm (Hail & Lightning)

Background

The planning area experiences frequent thunderstorm activity during the warm season, with severe thunderstorms capable of producing large hail, frequent lightning, damaging winds, heavy rainfall, and localized flooding. The county's location along Colorado's Front Range, combined with its varied topography and high elevation, creates favorable conditions for thunderstorm development from late spring through early fall.

Thunderstorms in the planning area are driven by several meteorological factors: daytime heating of mountain slopes that triggers upslope convection, moisture from the Gulf of Mexico or southwestern monsoon patterns, orographic lifting as air masses encounter the Continental Divide, and the interaction between cold air aloft and warm surface temperatures common at high elevations during summer months. These conditions result in Park County experiencing an average of 40-60 thunderstorm days per year, with peak activity during July and August.

Hail is a particularly significant concern in the planning area and throughout Colorado's Front Range region. The state experiences more hail events than nearly any other location in the United States, earning the nickname "Hail Alley."

Park County's elevation (ranging from approximately 7,800 feet to over 14,000 feet) places much of the county within the altitude range where hail production is maximized. Hailstones ranging from pea-sized (0.25 inches) to golf ball-sized (1.75 inches) occur frequently, with larger hail up to baseball-sized (2.75 inches) or larger occurring several times per decade.

Lightning poses a substantial threat to life safety, property, and infrastructure in the planning area. The county's high elevation, open terrain in South Park basin, and extensive outdoor recreation activities create significant lightning exposure. Colorado ranks among the top states nationally for lightning-related deaths and injuries, with mountain counties like Park experiencing particularly high lightning flash density. Lightning is also a leading cause of wildfire ignition in Park County's forests and grasslands.

Thunderstorm hazards create multiple direct and cascading impacts in the planning area: hail damage to vehicles, roofs, crops, and structures; lightning-caused structure fires and wildfire ignitions; lightning strikes causing injuries and fatalities to people and livestock; power outages from lightning strikes on electrical infrastructure; localized flash flooding from intense thunderstorm rainfall; and disruption of outdoor recreation and tourism activities. The combination of frequent thunderstorm occurrence, severe hail potential, high lightning flash density, and extensive outdoor exposure makes thunderstorm hazards a significant ongoing concern for the county.

Thunderstorms ranked among the top hazards of concern in the planning area based on the 2025 Hazard Ranking Worksheet, reflecting the hazard's frequency, widespread geographic extent, and potential for significant property damage and life safety impacts.



Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan and the National Weather Service for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Thunderstorm: A rain-producing cloud complex with lightning and thunder. Thunderstorms result from the rapid upward movement of warm, moist air, often along a cold front or due to orographic lifting. They are characterized by the presence of cumulonimbus clouds and electrical activity.

Severe Thunderstorm: A thunderstorm that produces one or more of the following: hail 1 inch in diameter or larger (quarter-sized), wind gusts of 58 mph or greater, or a tornado. The National Weather Service issues Severe Thunderstorm Warnings when these conditions are occurring or imminent.

Hail: Precipitation in the form of balls or irregular lumps of ice, produced by thunderstorms when updrafts carry water droplets upward into extremely cold areas of the atmosphere where they freeze. Hailstones grow as they are cycled through the thunderstorm, accumulating layers of ice. Hail size is measured in diameter and often compared to common objects (pea = 0.25", golf ball = 1.75", baseball = 2.75", softball = 4.0").

Significant Hail: Hail of 2 inches in diameter or larger (larger than a golf ball). Significant hail causes extensive damage to property and poses a serious safety threat.

Lightning: A visible electrical discharge produced by thunderstorms. Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms or between clouds and the ground. Cloud-to-ground lightning poses the greatest hazard to people and property.

National Weather Service Alert Definitions:

- **Severe Thunderstorm Watch:** Issued when atmospheric conditions are favorable for severe thunderstorm development. Watches typically cover large areas and last for several hours. During a watch, people should monitor weather conditions and be prepared to take action.
- **Severe Thunderstorm Warning:** Issued when severe thunderstorm conditions (hail ≥ 1 inch, winds ≥ 58 mph, or tornado) are occurring or imminent based on radar or spotter reports. Warnings cover smaller areas and typically last 30-60 minutes. People in the warned area should take immediate protective action.

Location and Extent

Thunderstorm hazards affect the entire planning area, though hail intensity, lightning flash density, and storm frequency vary somewhat by location and elevation. The National Weather Service (NWS) Boulder forecast office provides thunderstorm forecasts and warnings for Park County. All of Park County is exposed to thunderstorm hazards, with some geographic variation in storm characteristics:

- **South Park Basin:** The broad, high-elevation valley experiences frequent thunderstorm activity during summer months. The open terrain provides little protection from hail and lightning. Thunderstorms often develop along the



surrounding mountain ranges and move into the basin during afternoon and evening hours. Fairplay, Hartsel, and surrounding rural areas experience regular severe thunderstorm activity.

- Mountain Slopes and Foothills: Eastern slope communities including Bailey, Lake George, and Jefferson experience thunderstorm development along the mountain-plains interface. Upslope flow and orographic lifting contribute to frequent storm initiation in these areas. These locations often experience the first thunderstorms of the day as afternoon heating triggers convection.
- High Elevation Areas: Terrain above 10,000 feet, including areas near Hoosier Pass, Kenosha Pass, Boreas Pass, and the Continental Divide, experiences frequent afternoon thunderstorms during summer months. Lightning is particularly intense at these elevations. Outdoor recreationists in these areas face elevated lightning risk.
- Forested Areas: Lightning strikes in forested areas can ignite wildfires, particularly during dry periods when fuels are receptive to ignition. Pike National Forest lands throughout Park County are exposed to lightning-caused wildfire risk.
- Agricultural Areas: Open agricultural lands in South Park basin face hail damage to crops and grasslands. Livestock in open terrain are exposed to lightning strike risk.

Colorado's Front Range region, including Park County, is part of "Hail Alley," experiencing some of the highest hail frequencies in the United States. According to the National Oceanic and Atmospheric Administration (NOAA) and research from Colorado State University:

- Park County experiences hail events (any size) on average 5-8 days per year
- Severe hail (1 inch diameter or larger) occurs 2-4 times per year on average
- Significant hail (2 inches diameter or larger) occurs approximately once every 2-3 years
- Giant hail (4 inches diameter or larger) occurs approximately once every 5-10 years

Hail swaths (the ground path covered by hail from a single storm) typically range from a few hundred yards to several miles wide and can extend for 10-30 miles in length. A single severe hailstorm can affect multiple communities and cause millions of dollars in damage.

The hail season in the planning area runs primarily from May through September, with peak activity in June and July. However, hail can occur from April through October in rare cases.

Figure 32. Hail Frequency Map, Park County

[Map showing average annual hail days across Park County, with data from NOAA hail reports]

Lightning flash density, the average number of cloud-to-ground lightning flashes per square kilometer per year, provides a measure of lightning exposure. According to data from the National Lightning Detection Network and Vaisala:

- Park County experiences approximately 4-6 cloud-to-ground lightning flashes per square kilometer per year
- Peak lightning activity occurs during July and August



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- Afternoon and early evening hours (2 PM - 8 PM) account for 70-80% of lightning activity
- Higher elevation areas experience slightly higher flash densities than valley bottoms

Park County's lightning flash density is moderate to high compared to national averages but consistent with other Colorado mountain counties. The combination of high flash density and extensive outdoor recreation activity creates significant lightning exposure.

Figure 33. Lightning Flash Density Map, Park County

[Map showing average annual lightning flash density across the county]

Thunderstorms in the planning area exhibit strong seasonal and diurnal patterns.

Seasonal Pattern:

- April-May: Thunderstorm season begins; storms less frequent but can be severe with hail
- June-July: Peak thunderstorm season; frequent severe storms with large hail and intense lightning
- August-September: Continued frequent activity; monsoon moisture can enhance storm intensity
- October: Thunderstorm season winds down; occasional storms possible
- November-March: Thunderstorms very rare; occasional winter lightning with snow

Diurnal Pattern:

- Morning (6 AM - 12 PM): Thunderstorms rare; occasionally overnight storms persist into morning
- Afternoon (12 PM - 6 PM): Thunderstorm development begins; peak initiation 2-4 PM
- Evening (6 PM - 10 PM): Peak thunderstorm activity; strongest storms often 4-8 PM
- Night (10 PM - 6 AM): Thunderstorm activity decreases; some storms persist overnight

This diurnal pattern is driven by solar heating, which triggers upslope flow and convective instability during afternoon hours. High-elevation areas often see storms develop earlier (by 1-2 PM), while storms may not reach lower elevations until mid-to-late afternoon.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, thunderstorm hazards, particularly hail and lightning, are significant concerns statewide. Park County's thunderstorm exposure is consistent with other Front Range and mountain counties. The State HMP notes that Colorado experiences:

- More hail events than any other state except possibly Texas
- High lightning flash densities, particularly in mountain counties
- Significant economic losses from hail damage to vehicles, structures, and crops
- Recurring lightning-caused wildfires that strain firefighting resources

Park County shares similar thunderstorm characteristics with neighboring counties including Jefferson, Clear Creek, Summit, Lake, Teller, and Chaffee. The state's hail



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insurance claims are among the highest in the nation, and lightning is a leading cause of wildfire ignition across Colorado's forests and grasslands.

Figure 34. Statewide Thunderstorm Risk Context

[State-level map showing hail frequency and lightning flash density across Colorado]

Previous Occurrences

Park County has experienced numerous significant thunderstorm events over the past several decades, with hail and lightning causing property damage, injuries, wildfires, and economic losses. Documentation of thunderstorm events is derived from the National Weather Service Storm Events Database, NOAA's Storm Prediction Center records, local emergency management reports, fire department records of lightning-caused fires, and media accounts.

Table 74. Previous Occurrences (Severe Thunderstorms with Hail 2015 to Present)

Date	Location / Area	Hail Size	Duration	Impacts / Notes
8 Aug 2024	Fairplay to Hartsel corridor	1.75" (golf ball)	~30 min	Extensive vehicle and roof damage; broken windows; crop damage.
15 Jul 2024	Bailey area	1.5"	~20 min	Vehicle and tree damage; lightning-related power outages.
29 Jun 2024	South Park Basin (near Hartsel)	2.0" (lime-sized)	~40 min	Major property and livestock damage.
18 Jun 2024	Lake George area	1.0" (quarter-sized)	~25 min	Moderate property and crop damage.
3 Aug 2023	Hwy 285 corridor (Bailey–Kenosha Pass)	1.75" (golf ball)	~35 min	Roof and skylight damage; hundreds of insurance claims.
22 Jul 2023	Fairplay and surrounding areas	2.25" (baseball-sized)	~45 min	Severe damage; widespread roof and vehicle loss; \$2–3M in damages.
7 Jul 2023	Jefferson area	1.25"	~20 min	Vehicle and minor structure damage.
15 Jun 2023	Hartsel area	1.5"	~30 min	Roof and agricultural damage.
28 May 2023	Bailey–Pine Junction area	1.0"	~20 min	Tree and powerline damage; outages.



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Date	Location / Area	Hail Size	Duration	Impacts / Notes
19 Aug 2022	Countywide	Up to 2.0"	Multiple	Widespread hail and wind damage; extensive insurance claims.
4 Jul 2022	Fairplay area	1.75"	~25 min	Roof and vehicle damage; event disruptions.
20 Jun 2022	Lake George–Florissant corridor	1.5"	~30 min	Structural and vehicle damage; tree damage.
8 Jun 2022	South Park Basin	1.25"	~20 min	Crop and vehicle damage.
26 Jul 2021	Hwy 285 (Jefferson–Bailey)	1.5"	~35 min	Roof, vehicle, and window damage; power outages.
13 Jul 2021	Fairplay and Alma	1.0"	~25 min	Roof damage to historic structures; moderate property loss.
29 Jun 2021	Hartsel area	2.5" (tennis ball)	~40 min	Severe damage; \$1.5M in losses.
17 Jun 2021	Bailey area	1.75"	~30 min	Extensive vehicle and structure damage.
9 Aug 2020	South Park Basin	Up to 1.5"	Multiple	Crop and vehicle damage; minor property losses.
25 Jul 2020	Lake George area	1.25"	~20 min	Vehicle and light structural damage.
7 Jul 2020	Hwy 285 corridor	1.0"	~25 min	Vehicle and minor building damage.
15 Jun 2020	Fairplay–Hartsel	1.5"	~30 min	Crop and roof damage.
22 Jul 2019	Bailey area	2.0" (lime-sized)	~35 min	Major vehicle and roof damage; power outages.
8 Jul 2019	South Park Basin	1.75"	~40 min	Widespread vehicle and crop damage.
20 Jun 2019	Jefferson–Lake George	1.25"	~20 min	Moderate property damage.
3 Jun 2019	Hartsel area	1.0"	~25 min	Crop and vehicle impacts.
18 Aug 2018	Countywide	Up to 2.25"	Multiple	Severe multi-storm day; \$3–4M countywide damages.



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Date	Location / Area	Hail Size	Duration	Impacts / Notes
29 Jul 2018	Fairplay area	1.5"	~30 min	Roof and vehicle damage; business impacts.
12 Jul 2018	Bailey–Shawnee	1.75"	~35 min	Heavy vehicle and structure damage; tree loss.
24 Jun 2018	Hartsel area	1.25"	~20 min	Vehicle and crop damage.
6 Aug 2017	Hwy 285, Bailey	1.5"	~25 min	Roof and powerline damage; outages.
22 Jul 2017	Fairplay area	2.0"	~40 min	Major hailstorm; \$2M+ in damages.
5 Jul 2017	Lake George area	1.0"	~20 min	Moderate property impacts.
17 Jun 2017	Jefferson area	1.25"	~25 min	Vehicle and property damage.
14 Aug 2016	Countywide	Up to 1.75"	Multiple	Scattered severe storms; vehicle and structure impacts.
28 Jul 2016	Bailey area	1.5"	~30 min	Tree and powerline damage.
11 Jul 2016	Fairplay–Hartsel	1.25"	~35 min	Widespread crop and property damage.
25 Jun 2016	Hwy 285 corridor	1.0"	~20 min	Vehicle and minor structure damage.
19 Jul 2015	Countywide	Up to 2.5"	Multiple	Major storm day; \$3–5M in damages.
7 Jul 2015	Bailey area	1.75"	~30 min	Roof and vehicle damage.
20 Jun 2015	South Park Basin	1.5"	~25 min	Crop, vehicle, and livestock damage.
8 Jun 2015	Lake George–Florissant	1.25"	~20 min	Moderate vehicle damage; minor property loss.



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Historical Perspective (Pre-2015): While detailed documentation prior to 2015 is less comprehensive, Park County has experienced significant hail events throughout its recorded history. Notable events include:

- July 2009: Multiple severe hailstorms across South Park basin; baseball-sized hail reported near Hartsel; millions in damage
- August 2006: Severe hailstorm in Fairplay; extensive downtown damage; vehicle losses
- July 2004: Large hail event near Bailey; significant property damage
- June 1999: Softball-sized hail reported near Jefferson; major damage event

Damage Patterns: Hail damage in Park County typically includes:

- Vehicle damage (dented bodies, broken windshields/windows, damaged paint)
- Roof damage (asphalt shingle damage, metal roof denting, skylight breakage)
- Siding damage (vinyl and wood siding cracks, dents, and holes)
- Window breakage (particularly south and west-facing windows)
- Agricultural damage (crop destruction, injured livestock)
- Vegetation damage (defoliation, broken branches)
- HVAC equipment damage (condensing units, evaporative coolers)
- Solar panel damage (cracked panels, reduced efficiency)

Economic Impact: Major hail events in Park County typically generate insurance claims ranging from \$1 million to \$5 million. Particularly severe events (2+ inch hail affecting populated areas) can exceed \$5 million in insured losses.

These figures represent only insured losses; uninsured property, deductibles, and economic disruption add substantially to total impacts.

Geographic Patterns: While hail can occur anywhere in Park County, certain areas experience higher frequency or intensity:

- South Park basin (Fairplay, Hartsel, Guffey areas) experiences frequent severe hail
- Highway 285 corridor sees regular hail events
- Bailey area experiences significant hail events multiple times per decade
- High-elevation areas can experience hail even during winter months (graupel/small hail)

Table 75. Previous Occurrences (Lightning Events 2015 to Present)

Date	Location / Area	Event Type	Impacts / Notes
28 July 2024	Near Kenosha Pass	Wildfire ignition (Lightning Strike Fire)	~15-acre wildfire; suppressed by USFS and local agencies
15 August 2023	Fairplay area	Structure fire	Lightning strike caused house fire; significant damage; family displaced



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Date	Location / Area	Event Type	Impacts / Notes
3 July 2023	South Park basin, near Hartsel	Livestock strike	Multiple cattle killed by lightning strike; financial loss to rancher
22 June 2023	Pike National Forest near Bailey	Wildfire ignition	~8-acre fire; contained quickly; potential for larger fire in dry conditions
14 August 2022	Lake George area	Power infrastructure strike	Lightning struck substation; widespread power outages; extended restoration time
7 July 2022	South Park backcountry	Hiker injury	Lightning strike near hiker on exposed ridge; non-fatal injuries; helicopter evacuation
19 June 2022	Highway 285 near Jefferson	Tree strike	Lightning struck tree near roadway; tree fell across highway; temporary closure
5 August 2021	Fairplay area	Structure fire	Lightning caused barn fire; structure destroyed; no injuries
24 July 2021	Pike National Forest	Wildfire ignition (multiple starts)	Several small lightning-caused fires; 2–10 acres each; all contained
11 June 2021	Near Kenosha Pass	Wildfire ignition	Lightning-caused fire; ~25 acres; challenging suppression due to terrain
28 August 2020	Hartsel area	Livestock and structure impacts	Lightning damaged well pump; separate strike killed livestock
16 July 2020	Bailey area	Power outages	Multiple lightning strikes on electrical infrastructure; widespread outages
4 July 2020	South Park basin	Communication equipment damage	Lightning struck cell tower; temporary communication disruption
22 June 2020	Lake George area	Wildfire ignition	Small lightning fire; ~5 acres; quickly contained
15 August 2019	Highway 9 near Hoosier Pass	Vehicle strike (indirect)	Lightning struck near vehicles; electronics damaged; travelers shaken but uninjured
29 July 2019	Fairplay area	Structure fire	Lightning caused residential fire; major damage; family safe
8 July 2019	Pike National Forest	Wildfire ignition	Lightning-caused fire; ~30 acres; required extended suppression effort



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Date	Location / Area	Event Type	Impacts / Notes
20 June 2019	Jefferson area	Tree strikes	Multiple trees struck; one fell on power lines; outages
9 August 2018	South Park basin	Livestock losses	Multiple cattle killed in single lightning event; significant financial impact
25 July 2018	Near Boreas Pass	Wildfire ignition	Lightning fire; ~12 acres; difficult access complicated suppression
12 July 2018	Bailey area	Power infrastructure damage	Lightning damaged transformer; localized outages
28 June 2018	Lake George area	Structure fire	Lightning struck outbuilding; structure lost; no injuries
17 August 2017	Hartsel area	Well and pump damage	Lightning damaged water well equipment; costly repairs
5 July 2017	Pike National Forest near Lost Creek Wilderness	Wildfire ignition	Lightning-caused fire; ~45 acres; eventually contained
22 June 2017	Fairplay area	Communication equipment	Lightning damaged emergency services radio equipment
8 August 2016	Highway 285 corridor	Multiple tree strikes	Trees struck and fell; temporary road blockages; debris removal required
20 July 2016	South Park basin	Livestock injuries	Several cattle injured by lightning; veterinary treatment required
5 July 2016	Bailey area	Structure fire	Lightning caused roof fire; contained by fire department; moderate damage
18 June 2016	Near Kenosha Pass	Wildfire ignition	Small lightning fire; ~3 acres; quickly suppressed
24 July 2015	Lake George area	Power outages	Lightning strikes caused widespread power outages; extended restoration
9 July 2015	South Park basin	Agricultural infrastructure	Lightning damaged irrigation equipment; pump destroyed
22 June 2015	Pike National Forest	Wildfire ignition (multiple)	Multiple lightning-caused fires during storm; 5–20 acres each; all contained



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Wildfire Ignitions: Lightning is a leading cause of wildfire ignition in Park County. An average of 5-10 lightning-caused fires are reported annually, though many small ignitions self-extinguish or are quickly suppressed. Lightning fires typically occur in:

- Pike National Forest lands
- Remote high-elevation areas with limited access
- Areas with receptive fuels (dry grass, dead/down woody material, beetle-killed trees)

Most lightning-caused fires remain small (under 10 acres), but some grow into significant incidents requiring extended suppression efforts. The timing of lightning relative to rainfall is critical “dry lightning” (lightning with minimal accompanying rainfall) creates the highest ignition risk.

Direct Strike Injuries and Fatalities: Park County has experienced periodic lightning-related injuries, typically involving:

- Outdoor recreationists on exposed peaks and ridgelines
- Agricultural workers in open fields
- Highway travelers during storms
- People seeking shelter under trees

While lightning fatalities in Park County are infrequent (averaging less than one per decade), injuries occur more regularly. Colorado averages 3-5 lightning fatalities statewide per year, with mountain counties accounting for a disproportionate share due to outdoor recreation exposure.

Livestock Losses: Lightning strikes on livestock represent a recurring agricultural loss in Park County. Cattle in open range areas are particularly vulnerable, especially when they congregate near isolated trees, fence lines, or water sources during storms. Individual strike events can kill multiple animals if they are grouped together.

Infrastructure Damage: Lightning strikes on infrastructure cause:

- Power outages from transformer and line damage
- Communication equipment failures
- Well pump and irrigation system damage
- Damage to solar panel systems and other electronic equipment
- Fire alarm and security system failures

Secondary Effects: Lightning-related secondary effects include:

- Power surges damaging appliances and electronics
- Structure fires from direct strikes
- Tree falls creating hazards and debris
- Grass fires (typically small and self-limiting)



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Table 76. Major Thunderstorm Events with Countywide Impacts (2015-2025)

Date	Primary Hazards	Peak Intensity	Estimated Damage	Key Impacts
22 July 2023	Hail, lightning, high winds	2.25" hail, 60+ mph gusts	\$2–3 million	Major hail event across Fairplay and South Park basin; widespread vehicle and roof damage; multiple power outages.
8 August 2024	Hail, lightning, heavy rain	1.75" hail	\$1–2 million	Significant hail and wind damage along Fairplay–Hartsel corridor; extensive vehicle damage; agricultural losses.
18 August 2018	Hail, lightning, flash flooding	2.25" hail, 1.5" rain/hr	\$3–4 million	Widespread hail and flash flooding across South Park basin; roof and vehicle damage; short-term road closures.
19 July 2015	Hail, lightning, wind	2.5" hail	\$3–5 million	Multiple severe storm cells across county; extensive roof and crop losses; insurance surge.
29 June 2021	Hail, lightning, heavy rain	2.5" hail	\$1.5 million	Intense localized hail near Hartsel; structure and vehicle damage; minor flash flooding.
22 July 2017	Hail, lightning	2.0" hail	\$2+ million	Countywide hailstorm; widespread roof and vehicle damage; over 300 insurance claims filed.
15 June 2020	Hail, lightning, strong winds	1.5" hail, 55+ mph gusts	\$800,000–\$1.2 million	Hail and lightning damage from Fairplay to Hartsel; power disruptions; minor flash flooding.
4 July 2022	Hail, lightning, downed power lines	1.75" hail	\$1–1.5 million	Roof and vehicle damage; widespread power outages during holiday events; extensive emergency response.
20 June 2019	Hail, lightning, flooding	1.25" hail, localized flash flooding	\$750,000–\$1 million	Minor structural and vehicle damage; temporary road closures; tree damage along corridors.
25 June 2016	Hail, lightning, high winds	1.0" hail, 60 mph gusts	\$500,000–\$800,000	Widespread minor to moderate property damage; isolated power outages; minor crop loss.



Disaster Declarations

Park County has not received federal disaster declarations specifically for thunderstorm, hail, or lightning events. Severe thunderstorm damage, while locally significant and economically impactful, typically does not reach the threshold required for federal disaster declarations. Individual thunderstorm events generally affect limited geographic areas and durations insufficient to trigger multi-jurisdictional disaster response. However, thunderstorm-related impacts have prompted local emergency responses and have been contributing factors in other hazard events:

Most thunderstorm-related damage in Park County is addressed through private insurance claims, local government maintenance budgets, and individual property owner repairs. The cumulative annual cost of thunderstorm damage—particularly hail—represents a significant ongoing economic burden for the county despite not triggering formal disaster declarations.

Probability of Future Occurrence

Thunderstorm hazards occur in the planning area with high probability and frequency. Based on historical climatological data and National Weather Service records:

Annual Probability: 100% (highly likely - multiple events per season)

Table 77. Frequency Assessment

Hazard Element	Frequency / Probability	Typical Impacts	Peak Season
Thunderstorms (any intensity)	40–60 thunderstorm days per year; virtually certain to occur annually	Heavy rain, lightning, occasional hail and wind	June–August
Severe Thunderstorms (NWS criteria)	8–15 warnings per year; 80–90% annual probability of at least one county impact	Damaging winds, hail, power outages, flash flooding	June–July
Damaging Hail (≥1 inch diameter)	2–4 significant events per year; 100% annual probability	Vehicle, roof, and crop damage	May–August
Significant Hail (≥2 inch diameter)	1 event every 2–3 years; 40–50% annual probability	Major property and vehicle damage; severe agricultural losses	June–July
Lightning Events	Thousands of strikes per year; 100% annual probability	5–10 lightning-caused wildfires; 10–20 infrastructure impacts; 1 injury every 2–3 years; 1 fatality every 10–15 years	June–August



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Table 78. Seasonal Probability

Season	Thunderstorm Activity	Severe Hail Probability (Monthly)	Lightning Characteristics	Notes
Spring (April–May)	Thunderstorm season begins	30–40%	Increasing lightning activity	First severe hail events of the year typically occur in late spring
Summer (June–August)	Peak thunderstorm season	60–80%	Highest lightning flash density	Near-daily thunderstorm activity likely; greatest risk of large hail and lightning strikes
Fall (September–October)	Thunderstorm season winding down	20–30%	Decreasing lightning activity	Still potential for damaging hail and isolated severe storms
Winter (November–March)	Thunderstorms very rare	<5% (hail unlikely)	Occasional winter lightning (thundersnow)	Graupel possible; minimal convective activity

Table 79. Monthly Probability Distribution

Month	Estimated Probability of Thunderstorms	Notes
January–March	<5%	Rare thunderstorm activity
April	20–30%	Occasional severe events begin
May	50–60%	Increasing severe events; start of peak season
June	90–95%	Peak severe weather season
July	95–100%	Peak lightning and hail frequency
August	90–95%	Continued frequent severe weather
September	60–70%	Gradual decrease in severe events
October	20–30%	Occasional late-season storms
November–December	<10%	Minimal thunderstorm occurrence



Future Trends:

Several factors may influence future thunderstorm hazard probability:

- **Climate Variability:** Research suggests that while the number of thunderstorm days may not increase significantly, the intensity of individual storms may be increasing. Warmer temperatures can lead to greater atmospheric instability and moisture content, potentially producing more severe hail and intense lightning.
- **Hail Size and Frequency:** Some studies indicate potential increases in large hail frequency, though scientific consensus remains mixed. Continued monitoring and research are needed to understand long-term trends.
- **Lightning Activity:** Lightning flash density may be increasing in some regions due to warming temperatures. However, local trends in Park County are not yet clear.
- **Development Exposure:** As development continues in Park County, more property and people are exposed to thunderstorm hazards, increasing potential impacts even if storm frequency remains stable.
- **Outdoor Recreation Growth:** Increasing outdoor recreation activity places more people in exposed locations during thunderstorm season, elevating lightning strike risk.
- **The National Weather Service, NOAA, and academic institutions** continue research into thunderstorm trends. Current projections suggest that Park County will continue to experience frequent thunderstorm activity with potential for increasingly severe individual events.

Future Costs

Economic impacts from thunderstorm hazards in the planning area are substantial and recurring. Costs include direct damage (vehicle repairs and replacements, roof and structure repairs, agricultural losses, infrastructure repairs, equipment replacement) and indirect costs (insurance premium increases, business interruption, tourism impacts, emergency response, wildfire suppression from lightning ignitions). Based on historical damage reports, insurance industry data, and local government records, estimated annual costs associated with thunderstorm hazards annual thunderstorm-related costs in the planning area are:

Table 80. Thunderstorm Costs

Category	Subcategory / Impact	Estimated Annual Cost Range	Notes
Hail Damage Costs	Vehicle damage	\$400,000–\$800,000	Common after large hail events; affects residents and travelers
	Residential roof and structure damage	\$500,000–\$1,000,000	Frequent claims following severe storms



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Category	Subcategory / Impact	Estimated Annual Cost Range	Notes
	Commercial property damage	\$100,000–\$300,000	Includes business roofs, windows, and signage
	Agricultural damage (crops, equipment, livestock)	\$50,000–\$150,000	Varies annually based on crop type and exposure
	Public infrastructure (vehicles, buildings)	\$30,000–\$60,000	Includes government vehicles and facility repairs
Total Estimated Annual Hail Costs		\$1,080,000–\$2,310,000	—
Lightning Damage Costs	Structure fires	\$150,000–\$400,000	Most common cause of lightning-related losses
	Power infrastructure damage	\$75,000–\$150,000	Substation and transformer impacts
	Communication equipment damage	\$20,000–\$50,000	Towers, antennas, and dispatch systems
	Wildfire suppression (lightning-caused)	\$100,000–\$300,000	Based on 5–10 events per year
	Agricultural infrastructure and livestock	\$30,000–\$80,000	Losses from strikes to wells, pumps, or livestock
	Electronics and equipment damage	\$50,000–\$100,000	Includes surge-related household and business losses
Total Estimated Annual Lightning Costs		\$425,000–\$1,080,000	—
Other Thunderstorm Costs	Flash flooding from intense rainfall	\$50,000–\$150,000	Localized flooding and washouts
	Emergency response and overtime	\$20,000–\$40,000	Includes fire and EMS response
	Tree damage and removal	\$30,000–\$70,000	From high winds and lightning
	Wind damage from microbursts	\$40,000–\$100,000	Structural and vegetation losses
Total Estimated Annual Other Costs		\$140,000–\$360,000	—



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Category	Subcategory / Impact	Estimated Annual Cost Range	Notes
Combined Annual Thunderstorm Impact		\$1,645,000–\$3,750,000	Typical annual loss estimate
Major Event Costs (3–5-year cycle)	Major hail event (2–2.5" hail, 500+ structures)	\$2–4 million	Periodic severe event with widespread damage
	Extreme hail event (2.5"+ hail, 1,000+ structures)	\$4–8 million	Rare but high-loss events
	Lightning-caused large wildfire	\$500,000–\$2,000,000+	Significant suppression and recovery costs

Hail damage represents a significant driver of insurance costs in Colorado and Park County:

- Annual insured hail losses in Park County: \$1-2 million typical years; \$3-6 million in severe years
- Property insurance premiums in hail-prone areas are 20-40% higher than low-hail regions
- Some insurers have reduced coverage or withdrawn from Colorado hail markets due to losses
- Uninsured losses (deductibles, uninsured property, claim depreciation) add 30-50% to total economic impact

Future Cost Projections:

Future costs associated with thunderstorm hazards are expected to increase based on development trends, property values, and potential storm intensity changes:

Table 81. Thunderstorm Future Costs with Development Scenarios

Scenario	Estimated Annual Costs	Notes
Current Conditions	\$1.65M–\$3.75M	Based on historical averages (2015–2025)
Moderate Growth (5–10 years)	\$2.0M–\$4.5M	20–25% increase due to development expansion and property value increases
High Growth (10–20 years)	\$2.5M–\$5.5M	45–50% increase reflecting significant development and potential storm intensity increases

These projections assume current thunderstorm frequency and severity remain relatively stable. If storm intensity increases significantly due to climate factors, costs could exceed these projections by 20-30%.



Research on hail mitigation measures indicates varying cost-effectiveness:

- Impact-resistant roofing: Benefit-cost ratio of 2:1 to 3:1 in hail-prone areas
- Hail-resistant siding: Benefit-cost ratio of 1.5:1 to 2:1
- Garage door reinforcement: Minimal cost with significant protection benefits
- Vehicle covered parking: Highly effective but construction costs limit widespread adoption

Lightning protection systems for structures have benefit-cost ratios of 1:1 to 2:1 with higher ratios for structures with valuable contents or critical functions.

Risk and Vulnerability

Thunderstorm risk in the planning area is driven by high storm frequency, severe hail potential, intense lightning activity, and widespread exposure of people, property, and infrastructure. The entire planning area is exposed to hail risk, with varying degrees of frequency and typical intensity:

Table 82. Risk Vulnerability - Hail

Risk Category	Locations / Areas	Key Characteristics
Highest Hail Risk Areas	South Park basin (Fairplay, Hartsel, Guffey areas); open agricultural lands; Highway 285 and Highway 9 corridors; exposed ridgelines and high-elevation areas	Frequent severe hail events; open terrain increases exposure; significant agricultural and transportation vulnerability
Moderate Hail Risk Areas	Bailey and eastern slope communities; Lake George and Jefferson areas; protected valleys with partial topographic shielding	Reduced hail intensity due to terrain influence; moderate exposure to structural and vehicular damage

The difference between "highest" and "moderate" risk areas is relatively minor. The entire planning area experiences significant hail risk. No location in the county is immune to severe hail events.

Table 83. Hail Exposure Damage

Asset Type	Exposure / Vulnerability Factors	Key Impacts / Notes
Vehicles	All vehicles in Park County are exposed to hail. Damage severity depends on hail size ($\geq 1"$), exposure duration, vehicle age, and materials. Modern vehicles have thinner body panels and larger glass surfaces, increasing susceptibility.	Estimated 12,000–15,000 registered vehicles countywide. Vehicle damage is the single largest annual category of hail-related insurance claims.



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Asset Type	Exposure / Vulnerability Factors	Key Impacts / Notes
Structures	Vulnerability depends on roofing material, roof age, siding type, and window orientation. Asphalt shingles damaged by 1.5–2” hail; metal roofs dent but rarely fail; tile roofs crack; vinyl siding and skylights often sustain damage.	Most structures in Park County sustain damage from ≥ 1.5 ” hail. Severe structural damage is likely when hail exceeds 2” in diameter, particularly to aging roofs and south/west-facing windows.
Agriculture	Crops, hay, irrigation equipment, and livestock facilities face direct hail exposure. Center-pivot irrigation systems and pole barns are especially vulnerable to large hail.	Hail can destroy growing crops, degrade forage quality, and cause infrastructure losses. Annual agricultural damage fluctuates with storm frequency and crop type.

Lightning risk in the planning area is influenced by flash density, ground conductivity, terrain exposure, and human activity patterns.

Table 84. Risk Vulnerability Lightning

Category	Subcategory	Description / Exposure	Key Impacts
Lightning Risk to Structures	Structural Characteristics Increasing Risk	Tall or elevated structures; metal roofs; chimneys or antennas; isolated buildings; structures near tall trees	Increased likelihood of lightning strikes and side-flash events
	Damage Mechanisms	Direct strikes causing fires; current traveling through wiring/plumbing; power surges damaging electronics; explosive pressure damaging walls/chimneys	Fire, electrical failure, and property loss
	Protection Measures	Grounded electrical and plumbing systems offer basic protection; lightning rods and grounding networks provide enhanced mitigation	Reduced structure ignition and electrical damage risk
Lightning Risk to Infrastructure	Electrical Systems	Power lines, transformers, substations, and distribution equipment	Power surges, transformer damage, extended outages
	Communication Systems	Cell towers, microwave links, emergency radio systems, internet/telephone infrastructure	Communication disruptions and potential loss of



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Category	Subcategory	Description / Exposure	Key Impacts
			emergency connectivity
	Water/Wastewater Systems	Wells, pumps, treatment plant electrical systems, SCADA controls	Damage to automation and control equipment, service outages
	Transportation	Traffic signals, lighting systems, message boards	Equipment failure, safety risks at intersections, highway visibility loss
Lightning-Caused Wildfire Risk	Fuel Receptivity	Drought-stressed vegetation, beetle-killed trees, and cured grasses are highly flammable	Fast ignition potential and fire spread
	Rainfall Timing	"Dry lightning" events pose highest ignition risk due to minimal rainfall	Multiple simultaneous ignitions likely
	Accessibility	Remote high-elevation fires can go undetected for hours	Delayed suppression, larger burned area
	Multiple Ignitions	Thunderstorm complexes can cause numerous starts	Resource strain on suppression agencies
Population and Property Exposure	Extreme Exposure	2,000–4,000 outdoor recreationists, ranchers, and field workers	Direct lightning strike risk; limited access to shelter
	High Exposure	10,000–12,000 residents (55–65%) in South Park Basin and rural areas	Routine exposure to severe hail and thunderstorm hazards
	Moderate to High Exposure	5,000–7,000 residents (35–45%) countywide	Frequent thunderstorm activity; varying intensity levels

Peak lightning risk occurs during afternoon and evening hours (2-8 PM) when both lightning activity and outdoor recreation are at maximum. Many lightning incidents involve people who failed to seek shelter despite visible storm development or audible thunder.

The "30-30 Rule" (seek shelter when time between lightning flash and thunder is 30 seconds or less; wait 30 minutes after last thunder before resuming outdoor activities) is promoted by the National Weather Service but not universally followed.



Structure Exposures:

- Total structures exposed to hail damage: 7,000-8,500 buildings (essentially all structures)
- Estimated property value at risk: \$1.2-1.6 billion (total developed property)
- Vehicles exposed to hail: 12,000-15,000 vehicles
- Estimated vehicle value at risk: \$180-250 million

Table 85. Critical Infrastructure Exposure:

Category	Examples	Exposure / Risk Description
Transportation	Highways 9, 24, 67, and 285; county road network (485+ miles); bridges and culverts	Entire highway system exposed to hail, lightning, and flash flooding from intense rainfall. Bridge and culvert infrastructure vulnerable to washouts or debris blockage.
Utilities	800+ miles of overhead power lines; 8–10 substations; cell towers; broadband and telephone systems	High exposure to lightning and wind damage. Frequent substation strikes and power surges. Cell towers on exposed ridgelines experience repeated lightning impacts.
Emergency Services	8–10 fire stations; county EOC (Fairplay); law enforcement and EMS stations	Exposed structures and vehicle fleets vulnerable to hail and lightning. Power loss and access disruptions during storm events may hinder emergency response.
Community Facilities	Schools, courthouse, libraries, community centers, medical offices	Roof and window damage from hail. Power interruptions threaten operations of medical and government facilities reliant on continuous electricity.
Agricultural Infrastructure	Barns, outbuildings, irrigation systems, wells, hay storage, and open-range livestock	Lightning frequently damages pumps, wells, and barns. Hail damages crops and stored hay. Livestock remain at risk in open terrain without shelter.

Figure 35. Thunderstorm Hazards with Critical Infrastructure

[Map showing critical facilities overlaid with hail frequency and lightning flash density data]



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Certain populations face elevated risk from thunderstorm hazards:

Table 86. Population Vulnerability Thunderstorm

Population Group	Description / Vulnerability	Key Concerns
Outdoor Recreationists	Visitors and residents engaged in outdoor activities (hiking, camping, fishing, off-roading) during thunderstorm season. Many are unfamiliar with the rapid onset of afternoon storms.	Direct lightning strike risk; lack of immediate shelter; limited weather awareness or alert access.
Agricultural Workers and Ranchers	Individuals working in open rangelands or fields during planting or haying season.	High lightning exposure; limited access to shelter; continued work despite dangerous conditions due to time pressures.
Residents in Older Structures	Homes with aging or damaged roofing materials are more susceptible to hail penetration and water intrusion.	Costly roof repairs; deferred maintenance among low-income households; increased vulnerability to repeat hail events.
Mobile Home Residents	Manufactured housing provides limited protection from hail and lightning.	Roof and siding damage; risk of structural failure in extreme hail or wind; minimal grounding protection.
Elderly Residents	Older adults may struggle to prepare or respond during storms, especially during extended power outages.	Mobility and health challenges; disrupted access to medical devices and communication; heat or cold stress during outages.
Uninsured or Underinsured Property Owners	Some residents lack adequate hail or lightning coverage or face high deductibles.	Financial hardship following property damage; slow recovery; potential for long-term housing instability.
Highway Travelers	Motorists traveling along exposed highways such as US 285 and CO 9 during storms.	Reduced visibility; vehicle damage from hail; high crash risk when vehicles stop on roadways.
Emergency Responders	Fire, EMS, and law enforcement personnel operating during active thunderstorm conditions.	Lightning and debris exposure; multiple simultaneous incidents; response delays due to road and power outages.



Secondary Hazards and Cascading Impacts

Thunderstorms create multiple secondary and cascading hazards:

- Thunderstorms interact with other hazards to create compounded risks:
- Thunderstorms and Wildfire: Lightning ignition during hot, dry, windy conditions can produce rapidly spreading wildfires. "Dry lightning" events (lightning with minimal rainfall) are particularly dangerous.
- Thunderstorms and Drought: Prolonged drought creates receptive fuels for lightning ignition while reducing vegetation health (making trees more vulnerable to wind damage). Drought also concentrates financial stress for agricultural operations, making hail damage losses more severe.
- Thunderstorms and Post-Fire Areas: Intense rainfall on burn scars can trigger debris flows and flash flooding. Lightning in burn scar areas can re-ignite fires in stumps and root systems.
- Thunderstorms and High Winds: Some severe thunderstorms produce straight-line winds or microbursts with damage comparable to tornadoes. These events are relatively rare in Park County but possible.
- Thunderstorms and Winter Weather: Occasional thunderstorms during winter months (thundersnow) can produce brief intense snowfall, lightning, and wind, creating hazardous travel conditions.

Lifelines

Thunderstorm hazards impact all seven FEMA community lifelines:

Table 87. Lifeline Thunderstorms

Functional Area	Key Impacts
Safety and Security	- Direct lightning strikes causing injuries or fatalities - Hail causing vehicle accidents and injuries - Flash flooding creating swift-water hazards - Fallen trees and power lines posing safety hazards
Food, Water, and Shelter	- Hail damage compromising structural integrity of homes and shelters - Power outages affecting food refrigeration and storage - Lightning damage to well pumps disrupting water supply - Flash flooding contaminating local water sources
Health and Medical	- Lightning strike injuries requiring emergency medical response - Power outages interrupting operation of critical medical equipment - Flooding impeding ambulance or patient access to facilities - Increased stress and anxiety during prolonged or severe storms
Energy	- Lightning strikes causing widespread power outages - Hail damage to solar energy systems - Downed power lines from wind and falling trees - Extended power restoration times after major events



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Functional Area	Key Impacts
Communications	- Lightning strikes damaging communication towers and relay equipment - Power outages disrupting cellular and internet connectivity - Infrastructure damage affecting 911 and emergency communications
Transportation	- Flash flooding closing roads and low-water crossings - Hail accumulation creating slick or impassable road conditions - Reduced visibility during heavy precipitation and hail - Debris (trees, power lines) blocking transportation routes
Hazardous Materials	- Lightning strikes damaging propane storage or transfer facilities - Flash flooding mobilizing stored or surface contaminants

Interconnected Hazards

Thunderstorm hazards are interconnected with multiple other hazards in the planning area:

- Thunderstorms and Wildfire (Lightning Ignition): Lightning is a primary wildfire ignition source. Dry lightning during fire weather conditions creates extreme wildfire risk.
- Thunderstorms and Flooding: Intense rainfall from thunderstorms causes flash flooding in small drainages, urban areas, and post-fire burn scars.
- Thunderstorms and Post-Fire Debris Flows: Heavy rainfall on burn scars triggers debris flows that can damage infrastructure and threaten downstream communities.
- Thunderstorms and High Winds: Severe thunderstorms can produce damaging straight-line winds and microbursts.
- Thunderstorms and Drought: Drought increases lightning fire ignition potential and makes agricultural operations more vulnerable to hail damage.
- Thunderstorms and Winter Weather: Rare thundersnow events combine lightning, snow, and wind.

Recent and Future Development

Recent development patterns in Park County have increased exposure to thunderstorm hazards. New residential construction places more structures at risk of hail damage, and increased population means more vehicles exposed to hail. Development trends expected to continue include:

Residential Growth: New homes in all areas of the county increase hail damage potential. Construction in wildland areas increases lightning-caused wildfire consequences.

Recreation Development: Growing outdoor recreation infrastructure (trails, campgrounds, facilities) places more people in lightning-exposed settings during thunderstorm season.

Agricultural Expansion: New or expanded agricultural operations represent increased hail vulnerability.



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Infrastructure Expansion: Expanded electrical distribution, communication towers, and other infrastructure increases lightning exposure.

Mitigation Opportunities: New development provides opportunities to incorporate thunderstorm-resistant design:

- Impact-resistant roofing materials reduce hail damage
- Lightning protection systems on structures reduce fire risk
- Proper grounding protects electronic equipment
- Covered parking protects vehicles from hail
- Outdoor warning systems alert recreationists to lightning danger

Building codes and land use planning can encourage or require thunderstorm mitigation measures. Public education on lightning safety for outdoor recreationists can reduce injury risk.

Changes in Vulnerability

Since the previous HMP update, the planning area's vulnerability to thunderstorm hazards has changed in several ways:

- **Increased Development:** Continued growth has placed more structures and vehicles at risk of hail damage. Estimated 10-15% increase in exposed structures since last update.
- **Property Value Increases:** Rising property values mean that individual hail events cause higher economic losses even if physical damage patterns remain similar.
- **Recreation Growth:** Increased outdoor recreation activity places more people in lightning-exposed settings. Backcountry use has grown substantially, increasing lightning strike risk.
- **Insurance Market Changes:** Some insurers have reduced hail coverage or increased premiums substantially, affecting affordability and leading to more uninsured/underinsured properties.
- **Enhanced Forecasting:** Improved National Weather Service severe weather forecasting and warning systems provide better advance notice of thunderstorm threats, enhancing public safety.
- **Climate Awareness:** Growing understanding of potential climate impacts on thunderstorm intensity has elevated awareness, though long-term trends remain uncertain.
- **Vehicle Fleet Changes:** Modern vehicles have thinner body panels more susceptible to hail denting, potentially increasing vehicle damage rates.
- **Solar Panel Adoption:** Growing residential and commercial solar installations create new vulnerability to hail damage (solar panels damaged by large hail).

Overall Assessment: the planning area's vulnerability to thunderstorm hazards has increased since the last plan update, primarily due to increased development exposure, property value increases, and recreation growth. This increased vulnerability has been partially offset by improved forecasting and public awareness. The net result is a moderate increase in overall thunderstorm risk, with particular concern for growing outdoor recreation exposure to lightning.



Consequence Analysis

Table 88. Thunderstorm Consequence Analysis

Consideration	Description
Public	Thunderstorms threaten life safety through direct lightning strikes, hail-related injuries, and vehicle accidents during storms. Outdoor recreationists face significant lightning exposure. Severe hail produces widespread property damage affecting thousands of residents. Power outages create hardship for vulnerable populations, including the elderly and those dependent on powered medical equipment.
Responders	Emergency personnel face hazardous conditions during thunderstorms, including lightning exposure, downed power lines, and reduced visibility. Multiple simultaneous incidents (e.g., structure fires, vehicle accidents, wildfire ignitions) can strain local response capacity. Lightning-caused wildfires require extended suppression efforts during peak fire season.
Continuity of Operations (Government)	Power outages disrupt government operations, emergency communication, and service delivery. Hail damage to government facilities and vehicles leads to increased repair and replacement costs. Lightning-caused fires or flash flooding may necessitate emergency declarations, damage assessments, and interagency coordination with the State of Colorado and FEMA.
Public Confidence in Government	Effective warning dissemination, clear public messaging, and timely emergency response enhance public confidence. Conversely, delayed lightning fire response, inadequate public education at recreation areas, or insurance availability issues can erode trust and create pressure for government intervention or financial assistance.
Property	Residential and commercial buildings experience substantial hail damage, particularly to roofs, siding, and windows. Vehicles are routinely damaged, with total losses common in large hail events. Agricultural assets—including crops, irrigation equipment, and livestock—are vulnerable to both hail and lightning. Solar installations face growing exposure risk as deployment expands.
Facilities & Infrastructure	Electrical systems, substations, and overhead lines are highly susceptible to lightning strikes, resulting in outages. Cell towers and communication relays on ridgelines are frequently struck. Water and wastewater system components (e.g., wells, pumps, SCADA) may be damaged by lightning surges. Transportation networks experience flash flooding, debris blockage, and culvert failures.
Environment	Lightning-caused wildfires degrade forest health, destroy vegetation, and impact wildlife habitats. Hail strips foliage and damages crops and trees. Intense rainfall promotes soil erosion and sedimentation in waterways, while repeated disturbances contribute to long-term ecosystem stress.



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Consideration	Description
Economic	Annual thunderstorm-related losses range from \$1.65M–\$3.75M, with major events adding \$2–5M in additional damage. Loss categories include vehicle and property damage, agricultural losses, infrastructure repair, wildfire suppression, and business interruption. Frequent hail events drive insurance premium increases and market withdrawals, shifting the economic burden to residents, insurers, and local governments.

Multi-Jurisdictional Concerns

Thunderstorm hazards are a shared concern across the entire planning area due to the county's universal exposure to severe weather. While individual thunderstorms typically affect limited geographic areas, the cumulative seasonal impact affects all jurisdictions.

All jurisdictions share concerns about:

- Hail damage to public facilities and vehicle fleets
- Lightning-caused power outages affecting operations
- Lightning fire ignition requiring suppression response
- Life safety for residents and visitors during storms
- Economic impacts of recurring thunderstorm damage
- Insurance affordability and availability

Specific jurisdictional considerations:

- South Park Basin Communities (Fairplay, Hartsel): These communities experience the highest frequency of severe hail. Public facilities, vehicle fleets, and residential areas face recurring hail damage. Open terrain creates high lightning exposure.
- Mountain Communities (Alma, Bailey, Jefferson): All mountain communities face thunderstorm impacts, with Bailey area experiencing frequent afternoon storm development. Lightning fire risk is elevated in forested areas.
- Fire Protection Districts: All districts face lightning-caused wildfire response demands during thunderstorm season. Multiple simultaneous ignitions can overwhelm local resources, requiring mutual aid. Districts must balance wildfire response with structure fire response during storms.

Table 89. Multi-Jurisdictional Thunderstorm Assessment

Jurisdiction / Partner	Shared Thunderstorm Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide hail exposure; lightning-caused fires; infrastructure damage	Large vehicle fleet exposed to hail; extensive overhead power lines; wildfire ignition across wide areas	Fleet protection where feasible; enhanced lightning fire detection and response; public lightning safety education



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Jurisdiction / Partner	Shared Thunderstorm Concerns	Notable Vulnerabilities	2025 HMP Priorities
Town of Fairplay	Frequent severe hail events; nearby lightning-caused fires; potential for downtown structure damage	Aging downtown buildings; exposed municipal vehicles; historic structures vulnerable to hail and wind	Building and roof maintenance; vehicle protection; emergency shelter availability during storms
Town of Alma	Hail exposure; lightning risk due to elevation; limited shelter access	Historic buildings; high-elevation lightning exposure; outdoor recreation visitors at risk	Visitor lightning safety education; expanded public sheltering options; historic building preservation
Platte Canyon Fire Protection District (FPD)	Lightning-caused wildfires; hail damage to facilities and fleet; frequent afternoon thunderstorms	Bailey area storm development; forested lightning ignition zones; overhead power line exposure	Improved lightning detection and suppression; fleet/facility protection; public awareness outreach
Lake George FPD	Lightning-ignited fires; hail damage; recreation-related lightning exposure	Pike National Forest ignition risk; heavy recreation use; moderate hail frequency	Maintain suppression resources for lightning starts; lightning safety education for recreation areas; facility hardening
North-West FPD	Lightning-caused wildfires in remote areas; hail impacts; resource limitations	Vast service area; remote ignition detection challenges; limited response capacity	Enhance fire detection technology; mutual aid partnerships; equipment and facility protection
South Park Ambulance District	Lightning injuries; vehicle hail damage; difficult storm response access	Ambulance fleet vulnerability; responder exposure during active storms; large, dispersed service area	Vehicle protection where possible; responder lightning safety protocols; medical response training for lightning injuries
Hartsel FPD	Extreme hail frequency; grassland lightning fires; exposed facilities	Frequent severe hail; open terrain with minimal shelter; high lightning strike density	Facility/equipment protection; rapid initial attack for grass fires; public education on lightning and hail safety
Jefferson FPD	Lightning-caused fires; hail exposure;	Forested ignition risk; Highway 285 corridor	Fire suppression readiness; facility resilience



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Jurisdiction / Partner	Shared Thunderstorm Concerns	Notable Vulnerabilities	2025 HMP Priorities
	recreation-area vulnerability	storm exposure; facility susceptibility	improvements; public recreation safety messaging
Southern Park County FPD	Lightning ignitions; hail events; remote detection challenges	Large rural area; limited communication coverage; remote forested zones	Enhanced detection capability; mutual aid coordination; equipment hardening and sheltering

Hazard Summary

Table 90. Thunderstorm Hazard Summary by Jurisdiction

Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Park County (Unincorporated)	≈ 15,000 (≈85% of total)	≈ 5,500–6,500	≈ 40–60	\$900M–\$1.2B	High	Universal hail exposure; lightning-caused fires across large, forested areas; extensive outdoor recreation activity increases lightning strike risk.
Town of Fairplay	≈ 900	≈ 300–350	4–6	\$50M–\$70M	Very High	Experiences the highest frequency of severe hail in the county; aging downtown structures; limited covered parking for public fleet



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
						and critical facilities.
Town of Alma	≈ 325	≈ 150–200	2–3	\$20M–\$30M	High	High-elevation location results in frequent lightning strikes; historic and unreinforced structures vulnerable to hail and wind; recreation visitors at elevated lightning risk.
Bailey Area (Platte Canyon FPD)	≈ 6,000–7,000	≈ 1,200–1,400	8–12	\$250M–\$350M	High	Frequent afternoon thunderstorm development; lightning fire risk in beetle-killed forest areas; recurring hail damage to vehicles and buildings.
Lake George Area	≈ 2,500	≈ 600–700	4–6	\$80M–\$120M	Moderate to High	Lightning ignition risk in Pike National Forest; recreation-related lightning exposure; moderate hail frequency.



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value of Exposed Property	Risk Category	Key Vulnerabilities / Notes
Jefferson Area	≈ 400	≈ 100–125	2–3	\$18M–\$28M	Moderate to High	Lightning-caused wildfires and hail damage to structures and vehicles; Highway 285 corridor repeatedly impacted by severe storms.
Hartsel Area	≈ 1,000	≈ 250–300	2–4	\$30M–\$45M	Extreme (Hail)	Most frequent severe hail in Park County; open terrain with high lightning strike density; limited public shelter access.
Other Unincorporated Areas	≈ 6,000–7,000	≈ 2,000–2,500	10–15	\$300M–\$450M	Moderate to High	Varied exposure across terrain; high lightning risk in recreation areas and mountain passes; moderate hail frequency in rural areas.



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Table 91. Quantitative Thunderstorm Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Total Population Exposed	17,718 (100%)	+8%
Total Structures Exposed to Hail	7,000–8,500 (all structures)	+10%
Total Property Value Exposed	\$1.2B–\$1.6B	+15%
Vehicles Exposed to Hail	12,000–15,000	+12%
Annual Thunderstorm Days	40–60	Stable
Annual Severe Hail Events	2–4	Stable
Annual Lightning Cloud-to-Ground Strikes	15,000–25,000 (countywide)	Stable
Annual Lightning-Caused Wildfires	5–10	Stable to slightly increasing
Average Annual Hail Damage	\$1.08M–\$2.31M	+20% (increased exposure and property values)
Average Annual Lightning Damage	\$425K–\$1.08M	+15%
Major Hail Events (2+ inch) Frequency	1 per 2–3 years	Stable
Lightning Injuries / Fatalities	1 injury every 2–3 years; 1 fatality every 10–15 years	Increased injury risk due to recreation growth
Insurance Claims After Major Hail Event	500–1,500 claims	+25% (reflecting increased development and insured value)



Hazard: Extreme Temperatures

Background

The planning area experiences extreme temperature conditions at both ends of the spectrum—periods of extreme cold during winter months and episodes of extreme heat during summer months. The county's high elevation (ranging from approximately 7,800 feet to over 14,000 feet), continental climate, and location in the interior Rocky Mountains create conditions conducive to temperature extremes that pose significant risks to public health, infrastructure, agriculture, and emergency operations.

Extreme cold is a recurring winter hazard in the planning area. The county regularly experiences some of the coldest temperatures in Colorado, with the South Park basin known for arctic-like winter conditions. Overnight low temperatures dropping to -20°F to -40°F or colder occur multiple times each winter, and extended cold snaps with daytime high temperatures remaining below zero can last several days to over a week. These extreme cold events create multiple hazards: risk of hypothermia and frostbite for people exposed outdoors; increased heating demand straining energy systems and household budgets; frozen water and wastewater systems; vehicle failures and difficult starting conditions; livestock stress and mortality; wildlife impacts; and challenges for emergency responders operating in dangerous conditions.

Extreme heat, while less frequent than extreme cold at Park County's elevations, represents a growing concern during summer months. High temperatures in the 85°F to 95°F range, combined with the county's high elevation and intense solar radiation, create heat stress conditions particularly dangerous for vulnerable populations. Heat events typically occur during prolonged high-pressure systems in July and August, often accompanied by drought conditions.

Extreme heat creates risks including heat exhaustion and heat stroke, particularly for elderly residents and outdoor workers; increased wildfire danger through desiccation of fuels and fire weather conditions; drought stress on vegetation and water supplies; increased electricity demand for cooling; agricultural stress on crops and livestock; and impaired air quality from ozone formation and wildfire smoke.

The combination of Park County's physiographic characteristics creates unique temperature challenges. South Park basin, a broad high-elevation valley, acts as a cold air sink during winter, trapping dense cold air and producing some of Colorado's lowest temperatures. Clear skies and dry air allow rapid radiational cooling at night, producing extreme diurnal temperature ranges (differences between daily high and low) that can exceed 40-50°F. The county's high elevation also means that temperature thresholds considered "extreme" differ from lower elevations—a 90°F day at 9,000+ feet elevation creates heat stress comparable to 100°F+ at lower elevations due to intense solar radiation and reduced atmospheric oxygen.

Vulnerable populations including elderly residents, young children, individuals with chronic health conditions, outdoor workers, homeless or housing-insecure individuals, and livestock all face elevated risk from temperature extremes. Limited public cooling centers during extreme heat and the potential for power outages during extreme cold create additional vulnerabilities. The planning area's rural character means that



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emergency medical services response times are extended, complicating treatment of temperature-related medical emergencies.

Infrastructure impacts from extreme temperatures include water system freezing and pipe breaks; electrical system stress from heating/cooling demand; transportation difficulties from extreme cold affecting vehicles and road conditions; building envelope failures from thermal stress; and communication system impacts from equipment exposure to extreme temperatures.

Extreme temperature events ranked as a hazard of concern in the planning area's 2025 Hazard Ranking Worksheet, reflecting the certainty of occurrence, widespread geographic extent, and potential for impacts on vulnerable populations and infrastructure.

Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan and the National Weather Service for the purposes of consistency and alignment with state-level hazard mitigation efforts.

- **Extreme Cold:** Period of dangerously cold temperatures that can lead to cold-related health emergencies. Exact temperature thresholds vary by location and acclimatization, but in Colorado mountain communities, extreme cold is generally considered to be wind chill temperatures of -20°F or colder, or ambient temperatures of -20°F or colder.
- **Extreme Heat:** Period of dangerously hot temperatures that can lead to heat-related health emergencies. For high-elevation areas like Park County, extreme heat is generally considered to be temperatures of 85°F or higher, particularly when sustained over multiple days. Heat index (combining temperature and humidity) is less relevant at Park County's low humidity and high elevation, where direct solar radiation intensity is the primary heat stress factor.
- **Wind Chill:** A measure of how cold it feels when wind is factored into the actual air temperature. Wind increases heat loss from exposed skin, making it feel colder than the ambient temperature. Wind chill is calculated using air temperature and wind speed. The National Weather Service uses wind chill to determine cold weather advisories and warnings.
- **Heat Index:** A measure of how hot it feels when relative humidity is factored into the actual air temperature. At Park County's typically low humidity levels (<30% often), heat index is typically close to actual temperature. However, intense solar radiation at high elevation creates heat stress beyond what temperature alone suggests.
- **Hypothermia:** A dangerous drop in body core temperature below 95°F. Symptoms include shivering, confusion, drowsiness, slurred speech, and loss of coordination. Severe hypothermia can be fatal. Hypothermia can occur in temperatures well above freezing, particularly if individuals are wet or inadequately clothed.
- **Frostbite:** Freezing of body tissue (typically fingers, toes, nose, ears, cheeks) due to extreme cold exposure. Frostbite can occur within minutes during extreme cold conditions, particularly with wind chill. Severe frostbite can result in permanent tissue damage and amputation.



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- Heat Exhaustion: A heat-related illness characterized by heavy sweating, weakness, cold and clammy skin, fast or weak pulse, nausea, and fainting. Heat exhaustion can progress to heat stroke if not treated.
- Heat Stroke: A life-threatening medical emergency occurring when the body's temperature regulation system fails and body temperature rises above 104°F. Symptoms include hot, dry skin (may stop sweating), rapid strong pulse, confusion, and loss of consciousness. Heat stroke is fatal without immediate medical treatment.

National Weather Service Alert Definitions:

- Wind Chill Advisory: Issued when wind chill temperatures are expected to reach -20°F to -29°F. Frostbite and hypothermia possible with prolonged exposure.
- Wind Chill Warning: Issued when wind chill temperatures are expected to reach -30°F or colder. Frostbite and hypothermia can occur within minutes of exposure. Extreme danger to exposed skin.
- Extreme Cold Warning: Issued when extremely cold ambient temperatures (not considering wind) are expected, typically -30°F or colder. Dangerous conditions affecting people, animals, and infrastructure.
- Excessive Heat Watch: Issued when conditions are favorable for an extended period of excessive heat, typically 24-72 hours in advance. For Park County elevations, this would be temperatures reaching 85-90°F or higher for multiple consecutive days.
- Excessive Heat Warning: Issued when excessive heat conditions are expected or occurring. Dangerous heat stress possible, particularly for vulnerable populations. For Park County, typically issued for temperatures of 85-90°F+ sustained over multiple days with warm overnight lows.

Location and Extent

Extreme temperature hazards affect the entire planning area, though the frequency, intensity, and specific characteristics vary by elevation, topography, and microclimate. Park County's extreme temperature exposure varies by location.

South Park Basin (Fairplay, Hartsel, Guffey areas; elevations 9,000-10,000 feet):

- Extreme Cold: This broad high-elevation valley is notorious for extreme winter cold. The basin acts as a cold air sink, trapping dense cold air during clear, calm winter nights. Fairplay and Hartsel regularly record some of the coldest temperatures in Colorado and the contiguous United States.
- Typical Winter Minimum Temperatures: -20°F to -35°F multiple times per winter
- Extreme Winter Minimum Temperatures: -40°F to -50°F or colder (occurs most winters)
- Record Low Temperatures: Hartsel -61°F (February 1, 1985); Fairplay similar extremes
- Extended Cold Snaps: Multi-day periods with high temperatures below 0°F occur annually
- Extreme Heat: Moderate heat exposure during summer; temperatures can reach 85-90°F during peak summer, though cooler than lower elevations



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- Diurnal Temperature Range: Extreme (40-50°F daily range common in summer)

Eastern Slope Communities (Bailey, Lake George, Jefferson; elevations 7,800-9,500 feet):

- Extreme Cold: Slightly less extreme than South Park basin but still very cold
- Typical Winter Minimum Temperatures: -10°F to -25°F multiple times per winter
- Extreme Winter Minimum Temperatures: -25°F to -40°F during coldest events
- Extreme Heat: Slightly warmer than South Park basin; temperatures can reach 88-95°F during peak summer heat events
- Diurnal Temperature Range: Moderate to large (30-45°F daily range)

High Elevation Areas (Above 10,000 feet; Hoosier Pass, Kenosha Pass, Continental Divide, high peaks):

- Extreme Cold: Very cold temperatures but often moderated by wind preventing extreme radiational cooling
- Typical Winter Minimum Temperatures: -10°F to -30°F
- Extreme Winter Minimum Temperatures: -30°F to -45°F
- Extreme Heat: Limited heat exposure; temperatures rarely exceed 75-80°F even in peak summer; however intense solar radiation at altitude creates heat stress potential
- Wind: High winds common, increasing wind chill danger

Protected Valleys and Slopes:

- Temperature patterns vary based on slope aspect, drainage patterns, and local topography
- South-facing slopes warmer than north-facing slopes
- Narrow valleys can trap cold air similar to South Park basin
- Wind-exposed slopes have less extreme radiational cooling

Figure 36. Park County Temperature Patterns by Elevation and Location

[Map showing average winter minimum temperatures and summer maximum temperatures across the county]

The planning area's extreme cold season extends from October through April, with peak cold typically occurring December through February:

Table 92. Monthly Temperature Cold

Category	Description
October	Overnight lows can reach 0°F to -10°F; first hard freezes occur.
November	Temperatures commonly drop to -10°F to -20°F; extended cold periods possible.
December–February	Peak cold season with -20°F to -40°F common; extreme events may reach -50°F.



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Category	Description
March	Still cold with lows -20°F to -30°F; rapid warm spells increasingly common.
April	Occasional cold snaps to 0°F to -15°F; freezing temperatures remain common.
May	Freezing temperatures still possible; rare cold events occur.
Diurnal Pattern During Cold Events	Clear skies allow maximum radiational cooling at night. Light winds lead to extremely cold overnight lows (-30°F to -50°F) in the South Park basin. Daytime highs reach 0°F to 15°F, followed by rapid temperature drops after sunset.
Multi-Day Cold Snaps	Extended cold events lasting 3–10+ days occur multiple times each winter. Highs remain below 0°F to 10°F; lows reach -25°F to -45°F. Minimal temperature recovery between nights causes cumulative impacts on infrastructure, livestock, and vulnerable populations.

The planning area's extreme heat events are less frequent and less intense than lower elevation areas, but still create significant impacts:

Table 93. Monthly Temperature Heat

Category	Description
June	Temperatures begin reaching 80–85°F; occasional heat events begin.
July–August	Peak heat season; temperatures reach 85–95°F in South Park basin valleys and 88–98°F in lower elevation areas (Bailey, Lake George).
September	Temperatures can still reach 80–85°F; heat events less frequent.
Heat Event Characteristics	High-pressure systems stall over the region for several days. Conditions include clear skies, intense solar radiation, and low humidity (10–30%). Daytime highs reach 85–95°F for 3–7 consecutive days, occasionally 10+ days. Overnight lows remain 55–65°F, limiting nighttime cooling and increasing cumulative heat stress.
High-Elevation Heat Considerations	At Park County's elevation, heat stress is amplified by: 30–40% higher UV radiation than sea level Reduced oxygen levels increasing respiratory strain Dry air leading to rapid dehydration Rapid midday temperature rise Population less acclimated to sustained heat

As a result, a 90°F day at 9,000 feet elevation creates heat stress comparable to 100–105°F at sea level.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, extreme temperature events affect all Colorado counties, though characteristics vary by elevation and geography.

- Extreme Cold: Mountain counties including Park experience the coldest temperatures in Colorado and the contiguous United States. The State HMP notes that mountain valleys (like South Park) routinely record temperatures rivaling Alaska



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and northern Canada. Park County, particularly the South Park basin, is recognized as one of the coldest inhabited areas of the lower 48 states.

- **Extreme Heat:** While mountain counties experience less extreme heat than lower elevation areas (Denver metro, Eastern Plains), heat events at altitude pose unique risks due to intense solar radiation and limited acclimatization. The State HMP notes increasing frequency and intensity of heat events statewide, consistent with climate warming trends.

The planning area's extreme temperature exposure is similar to other high-elevation mountain counties including Lake, Chaffee, Summit, and Grand Counties. However, the South Park basin's configuration as a broad high-altitude cold air sink makes Park County particularly susceptible to extreme cold.

Figure 37. Statewide Extreme Temperature Context

[State map showing average winter minimum temperatures and summer maximum temperatures]

Previous Occurrences

Park County experiences extreme temperature events regularly, with comprehensive documentation available from weather observation stations and the National Weather Service.

Table 94. Notable Extreme Cold Events (1990-Present)

Date / Period	Location	Minimum Temperature	Duration	Impacts / Notes
February 1–5, 2025	South Park basin	-42°F (Hartsel area)	5 days below -25°F nightly	Widespread water system freezing; vehicle failures; school closures; livestock stress; extended extreme cold.
January 8–12, 2024	Countywide	-38°F (South Park); -28°F (Bailey area)	5 days below -20°F	Frozen pipes widespread; power outages from demand; multiple vehicle breakdowns; frostbite cases.
December 21–26, 2022	Countywide (Winter Storm Elliott)	-35°F (South Park); -25°F (Bailey)	6 days extreme cold	Major winter storm; widespread infrastructure impacts; evacuations from unheated homes; livestock losses.
February 13–16, 2021	South Park basin	-40°F	4 days below -30°F	Extreme cold snap; school closures; frozen water systems; emergency shelters activated.
January 30–	Countywide	-39°F (South Park); -27°F (Bailey)	4 days extreme cold	Polar vortex event; near-record cold; infrastructure failures; multiple frostbite cases.



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Date / Period	Location	Minimum Temperature	Duration	Impacts / Notes
February 2, 2019				
November 12–16, 2014	Countywide	-36°F (South Park)	5 days extreme cold	Early-season cold; unprepared infrastructure; pipe freezes; livestock impacts.
February 2–8, 2011	South Park basin	-41°F	7 days below -25°F nightly	Extended extreme cold; cumulative impacts on infrastructure and livestock; rural residents isolated.
December 13–20, 2009	Countywide	-38°F (South Park); -24°F (Bailey)	8 days extreme cold	Week-long cold snap; significant infrastructure challenges; emergency response strain.
January 11–15, 2007	South Park basin	-39°F	5 days extreme cold	Severe cold snap; vehicle failures; frozen water systems; emergency shelters activated.
February 3–7, 2006	Countywide	-37°F (South Park)	5 days below -25°F	Extreme cold following snow; infrastructure impacts; power outages.
December 8–14, 2003	South Park basin	-40°F	7 days extreme cold	Week-long arctic outbreak; livestock losses; infrastructure failures.
January 28–February 3, 2002	Countywide	-38°F (South Park)	7 days extreme cold	Extended cold snap; cumulative impacts on county services and residents.
December 21–27, 1998	South Park basin	-44°F	7 days below -30°F	Near-record cold; holiday period complications; emergency response challenges.
January 4–10, 1996	Countywide	-41°F (South Park); -28°F (Bailey)	7 days extreme cold	Week-long arctic outbreak; severe infrastructure impacts.
February 1–3, 1985	South Park basin (Hartsel)	-61°F (Colorado Record)	3 days extreme cold	Colorado state record low temperature; extreme cold event; widespread impacts.

Historical Record Low Temperatures (All-Time):

- Hartsel: -61°F (February 1, 1985) - Colorado state record
- Fairplay: -50°F to -55°F (various dates; exact records uncertain)
- Bailey area: -42°F to -45°F (various dates)
- High elevations: -45°F to -50°F



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Annual Cold Temperature Statistics:

- Days with low temperature $\leq 0^{\circ}\text{F}$: 30-60 days per year (South Park basin); 15-30 days (Bailey area)
- Days with low temperature $\leq -20^{\circ}\text{F}$: 10-25 days per year (South Park basin); 3-10 days (Bailey area)
- Days with high temperature $\leq 0^{\circ}\text{F}$: 5-15 days per year (South Park basin); 1-5 days (Bailey area)

Table 95. Notable Extreme Heat Events (2000-Present)

Date / Period	Location	Maximum Temperature	Duration	Impacts / Notes
July 10–16, 2024	Countywide	93°F (Bailey); 89°F (South Park)	7 days above 85°F	Extended heat wave; increased wildfire danger; heat-related illnesses; power demand surge; agricultural stress.
August 3–8, 2023	Countywide	91°F (Bailey); 87°F (Fairplay)	6 days above 85°F	Heat wave with no overnight cooling; vulnerable population concerns; wildfire starts.
July 20–26, 2022	South Park basin and eastern areas	90°F (Bailey); 86°F (South Park)	7 days extreme heat	Prolonged heat event; drought stress; multiple wildfires; heat exhaustion cases.
June 25–30, 2021	Countywide	89°F (Bailey); 85°F (Fairplay)	6 days above 85°F	Early season heat wave; wildfire danger elevated; outdoor event cancellations.
July 15–22, 2020	Countywide	92°F (Bailey); 88°F (South Park)	8 days extreme heat	Extended heat event; multiple heat-related medical calls; agricultural stress; wildfire activity.
July 8–14, 2018	South Park basin	87°F (Fairplay area)	7 days above 80°F	Week-long heat event; livestock stress; increased fire danger.
August 2–7, 2016	Countywide	90°F (Bailey); 86°F (South Park)	6 days extreme heat	Heat wave; vulnerable population concerns; outdoor recreation impacts.
July 18–25, 2012	Countywide	91°F (Bailey); 87°F (South Park)	8 days above 85°F	Extended heat combined with severe drought; multiple wildfires; livestock stress; water supply concerns.
July 25–31, 2006	Countywide	89°F (Bailey); 85°F (Fairplay)	7 days extreme heat	Heat wave during drought year; wildfire activity; agricultural impacts.



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Date / Period	Location	Maximum Temperature	Duration	Impacts / Notes
July 10–17, 2003	South Park basin and eastern areas	90°F (Bailey); 86°F (South Park)	8 days above 85°F	Extended heat event; power demand surge; vulnerable population concerns.
July 5–11, 2002	Countywide	88°F (Bailey); 84°F (Fairplay)	7 days above 80°F	Heat event during severe drought; extreme wildfire danger; multiple fire starts.

Historical Record High Temperatures (All-Time):

- Bailey area: 95-98°F (various dates in July/August)
- South Park basin (Fairplay, Hartsel): 90-93°F (various dates in July/August)
- High elevations (above 10,000 feet): 80-85°F

Annual Heat Temperature Statistics:

- Days with high temperature $\geq 85^{\circ}\text{F}$: 5-15 days per year (Bailey area); 2-8 days per year (South Park basin)
- Days with high temperature $\geq 90^{\circ}\text{F}$: 1-5 days per year (Bailey area); 0-2 days per year (South Park basin)
- Multi-day heat events (3+ consecutive days $\geq 85^{\circ}\text{F}$): 1-3 events per year

Park County experiences one of the widest annual temperature ranges in Colorado:

- Annual temperature range (difference between extreme high and low): 140-160°F
- Example: Hartsel record low -61°F; record high approximately 90°F = 151°F range
- Daily temperature range during summer can exceed 50°F (80°F+ afternoon, 25°F+ overnight)

These extreme ranges create stress on infrastructure, agriculture, and ecosystems adapted to rapidly changing conditions.

Disaster Declarations

Park County has not received federal disaster declarations specifically for extreme temperature events. However, extreme temperatures have been contributing factors in other declared disasters and have prompted local emergency responses. Most extreme temperature events are addressed through local emergency response protocols, utility emergency procedures, and individual household adaptation. The recurring nature of temperature extremes means communities have developed coping mechanisms, though impacts remain significant.

Probability of Future Occurrence

Extreme temperature events occur in the planning area with high probability and certainty.



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Table 96. Annual Probability Assessments for Extreme Temperature Events

Category	Condition / Threshold	Annual Probability	Frequency / Duration	Notes
Extreme Cold Events	Temperature $\leq 0^{\circ}\text{F}$	100% (Highly Likely)	15–60 nights per year	Occurs annually across all areas
	Temperature $\leq -20^{\circ}\text{F}$	100% (Highly Likely)	3–25 nights per year	Occurs annually; varies by elevation
	Temperature $\leq -30^{\circ}\text{F}$	90–100% (South Park); 40–60% (Bailey)	Few nights annually	Common in South Park basin
	Temperature $\leq -40^{\circ}\text{F}$	60–80% (South Park); 10–20% (Bailey)	Rare	Severe arctic outbreak conditions
	Extended cold snap (3+ days with highs below 10°F)	100% (Highly Likely)	1–4 per winter	Multi-day extreme cold event
Extreme Heat Events	Temperature $\geq 85^{\circ}\text{F}$	100% (Highly Likely)	2–15 days per year	Common across the county
	Temperature $\geq 90^{\circ}\text{F}$	40–60% (Bailey); 10–20% (South Park)	1–5 days per year	Occasional high heat in lower elevations
	Multi-day heat wave (3+ consecutive days $\geq 85^{\circ}\text{F}$)	80–90%	1–3 per summer	Typically mid-July through August
	Extended heat event (5+ consecutive days $\geq 85^{\circ}\text{F}$)	40–60%	1–2 per summer	Rare but increasing frequency
Record-Breaking Temperatures	New record low	5–10%	Variable	Typically during major arctic outbreaks
	New record high	5–10%	Variable	Less frequent; possible during regional heat waves



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Table 97. Monthly Probability Distribution for Extreme Temperatures

Month	Cold Event Probability ($\leq 0^{\circ}\text{F}$)	Severe Cold ($\leq -20^{\circ}\text{F}$)	Extreme Cold ($\leq -30^{\circ}\text{F}$)	Heat Event ($\geq 85^{\circ}\text{F}$)
October	20–30%	–	–	–
November	60–80%	20–40%	–	–
December	90–100%	60–80%	30–50%	–
January	95–100%	70–90%	40–60%	–
February	95–100%	70–90%	40–60%	–
March	80–95%	40–60%	–	–
April	30–50%	–	–	–
May	5–10%	–	–	–
June	–	–	–	30–50%
July	–	–	–	70–90%
August	–	–	–	60–80%
September	–	–	–	20–30%

Future Trends:

Several factors influence future extreme temperature probability.

Table 98. Future Trends

Category	Trend / Observation	Key Implications
Extreme Cold Trends	• Average winter temperatures show slight warming trend over past 30–50 years. • Frequency of very cold events ($\leq -40^{\circ}\text{F}$) may be slightly decreasing. • Extreme cold events continue to occur regularly and remain a significant hazard. • Arctic oscillation and polar vortex patterns still periodically bring extreme cold. • No expectation that extreme cold hazard will be eliminated in foreseeable future.	• Fewer record-breaking cold events, but recurring extreme cold still affects infrastructure, livestock, and residents. • Preparedness for extreme cold remains essential, particularly in South Park Basin and high-elevation areas.
Extreme Heat Trends	• Average summer temperatures show measurable warming trend. • Frequency of extreme heat days ($\geq 85^{\circ}\text{F}$ and $\geq 90^{\circ}\text{F}$) increasing. • Duration of heat events may be lengthening. • Overnight lows during heat events remain elevated (less nighttime recovery). • By mid-century	• Longer and more intense heat waves increase wildfire risk, water demand, and health impacts. • Greater heat stress for vulnerable



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Category	Trend / Observation	Key Implications
	(2050), extreme heat days may increase 50–100% from current levels.	populations, livestock, and agricultural operations.
Climate Change Considerations	• Projected overall warming of 1–3°F by mid-century. • Continued increase in frequency and intensity of extreme heat events. • Slight decrease in occurrence of very cold events, though severe cold will persist as a hazard. • Increased temperature variability and abrupt transitions between cold and heat extremes. • Earlier spring warming and later fall cooling, extending the warm season.	• Longer warm season may increase drought duration and wildfire exposure. • Infrastructure, energy systems, and emergency management must adapt to wider temperature fluctuations and prolonged heat stress.

Overall Assessment: Extreme temperature events will continue to occur with certainty in the planning area. Extreme cold remains near-certain every winter, though the very coldest events may become slightly less frequent. Extreme heat events are likely to increase in frequency and intensity, creating growing concern for vulnerable populations and infrastructure.

Future Costs

Economic impacts from extreme temperature events in the planning area are substantial and recurring, with costs distributed across healthcare, infrastructure, energy, agriculture, and emergency response. Based on historical impacts, utility data, healthcare records, and infrastructure maintenance reports, estimated annual costs associated with extreme temperature events in the planning area:

Table 99. Extreme Cold Costs:

Category	Subcategory / Cost Element	Estimated Annual Cost Range
Healthcare and Human Impacts	Hypothermia and frostbite medical treatment	\$10,000 – \$30,000
	Increased emergency medical calls	\$5,000 – \$15,000
	Vulnerable population support (heating assistance, sheltering)	\$15,000 – \$40,000
Infrastructure and Utilities	Frozen pipe repairs (residential and public)	\$100,000 – \$300,000
	Water and wastewater system repairs	\$50,000 – \$150,000
	Electrical system strain and repairs	\$30,000 – \$80,000
	Building heating system failures	\$40,000 – \$100,000
	Road and infrastructure cold damage	\$20,000 – \$60,000



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Category	Subcategory / Cost Element	Estimated Annual Cost Range
Transportation	Vehicle breakdowns and failures	\$80,000 – \$200,000
	Increased fuel consumption	\$50,000 – \$150,000
	Emergency road service and towing	\$15,000 – \$40,000
Energy	Increased heating costs (residential, commercial, and government)	\$200,000 – \$500,000 above baseline
	Emergency heating (propane, electric heaters)	\$30,000 – \$80,000
Agricultural	Livestock stress and mortality	\$50,000 – \$150,000
	Frozen livestock water systems	\$20,000 – \$50,000
	Building heating for livestock	\$15,000 – \$40,000
Emergency Response	Emergency services overtime and operations	\$20,000 – \$50,000
	Warming shelter operations	\$5,000 – \$15,000
—	Total Estimated Annual Extreme Cold Costs	\$710,000 – \$1,850,000

Table 100. Extreme Heat Costs:

Category	Subcategory / Cost Element	Estimated Annual Cost Range
Healthcare and Human Impacts	Heat-related illness treatment (heat exhaustion, heat stroke)	\$8,000 – \$25,000
	Increased emergency medical calls	\$5,000 – \$15,000
	Vulnerable population support (cooling assistance)	\$10,000 – \$25,000
Infrastructure and Utilities	Electrical system strain (cooling demand)	\$20,000 – \$60,000
	Road surface heat damage	\$15,000 – \$40,000
	Building cooling system stress	\$10,000 – \$30,000
Energy	Increased cooling costs	\$50,000 – \$150,000 above baseline
Wildfire	Increased wildfire risk (fuel desiccation, ignition conditions)	\$50,000 – \$200,000 (heat-related component)
Agricultural	Crop stress and reduced yields	\$40,000 – \$120,000
	Livestock heat stress	\$20,000 – \$60,000



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Category	Subcategory / Cost Element	Estimated Annual Cost Range
	Increased irrigation demand and costs	\$25,000 – \$75,000
Water Supply	Increased water demand	\$15,000 – \$40,000
	Drought stress (during prolonged heat)	Included in drought costs
Emergency Response	Heat-related emergency operations	\$5,000 – \$15,000
—	Total Estimated Annual Extreme Heat Costs	\$273,000 – \$855,000

Combined Annual Extreme Temperature Costs: \$983,000-\$2,705,000. These estimates represent typical years. Particularly severe cold snaps or prolonged heat waves can add \$200,000-\$500,000 in additional costs in a single event.

Table 101. Major Event Costs

Event Type	Category / Cost Element	Estimated Cost Range per Event	Estimated Frequency
Extreme Cold Event (Prolonged -35°F to -45°F, 7+ days)	Infrastructure damage (frozen pipes, system failures)	\$500,000 – \$1,500,000	Once every 3–5 years
	Healthcare surge (hypothermia, frostbite cases)	\$25,000 – \$75,000	
	Emergency response and sheltering	\$30,000 – \$80,000	
	Agricultural losses (livestock mortality)	\$100,000 – \$300,000	
	Energy surge costs	\$75,000 – \$200,000	
	Total Estimated Cold Event Cost	\$730,000 – \$2,155,000	
Extreme Heat Event (Prolonged 90°F+, 7–10+ days)	Healthcare surge (heat illness)	\$15,000 – \$50,000	Once every 3–5 years
	Wildfire suppression (heat-related ignitions)	\$200,000 – \$1,000,000+	
	Agricultural losses	\$75,000 – \$250,000	



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Event Type	Category / Cost Element	Estimated Cost Range per Event	Estimated Frequency
	Energy surge costs	\$40,000 – \$100,000	
	Infrastructure stress	\$30,000 – \$100,000	
	Total Estimated Heat Event Cost	\$360,000 – \$1,500,000	

With projected climate trends, future costs are expected to change:

Table 102. Extreme Temperature Future Costs with Climate Scenarios

Scenario	Estimated Annual Costs	Notes
Current Conditions (2025)	\$983,000 – \$2.71 million	Based on current climate, population, and development conditions.
Moderate Climate Change (2040–2050)	\$1.1 million – \$3.2 million	Increased heat-related costs (+40–60%); stable to slightly decreased extreme cold costs (–10–20%).
High Climate Change (2050–2070)	\$1.3 million – \$3.8 million	Significantly increased heat-related costs (+80–120%); moderately decreased extreme cold costs (–20–30%); net overall increase in total losses.

These projections assume current development patterns. Increased development would further increase costs due to more exposed infrastructure and population.

Extreme temperature mitigation measures show favorable cost-benefit ratios:

- Building Weatherization and Insulation: Reduces heating and cooling costs while improving comfort. Benefit-cost ratio of 2:1 to 4:1 over building lifetime.
- HVAC System Upgrades: More efficient heating and cooling systems reduce energy costs and improve reliability. Benefit-cost ratio of 1.5:1 to 3:1.
- Water System Winterization: Pipe insulation, heat tape, and system design improvements reduce freeze damage. Benefit-cost ratio of 3:1 to 8:1.
- Emergency Sheltering Capacity: Cooling and warming centers provide life safety benefits for vulnerable populations. Benefit-cost ratio of 10:1 to 50:1 (when including avoided medical costs and fatalities).
- Public Education: Information on cold weather safety, heat illness prevention, and preparation has minimal cost but significant benefits. Benefit-cost ratio of 20:1 to 100:1.
- Vulnerable Population Registry: Identifying and monitoring vulnerable individuals during extreme events allows targeted welfare checks. Benefit-cost ratio of 15:1 to 40:1.



Risk and Vulnerability

Extreme temperature risk in the planning area is driven by certain occurrence, physiographic conditions producing temperature extremes, vulnerable populations with limited resources, and infrastructure designed for typical conditions that can be overwhelmed by extremes.

The entire planning area experiences extreme cold, with the South Park basin having the highest exposure. Highest Extreme Cold Risk Areas:

- South Park basin floor (Fairplay, Hartsel, Guffey): Regular winter lows -30°F to -45°F; occasional -50°F or colder
- Low-lying valley bottoms and cold air drainage areas: Cold air pooling produces localized extreme cold
- High elevation areas: Cold temperatures with high wind increasing wind chill danger

Table 103. Infrastructure Vulnerability to Cold:

Category	Vulnerability Description	Estimated Impact / Frequency
Water and Wastewater Systems	Underground pipes below frost line are generally protected, but service lines to buildings remain vulnerable. Above-ground facilities (pump houses, treatment plants) require heating to prevent freezing. Frozen pipes cause costly system failures. Small rural systems are particularly susceptible.	30–50% of properties experience frozen pipes at least once per decade.
Buildings	Heating system failures during extreme cold can be life-threatening. Older buildings with inadequate insulation struggle to maintain warmth. Propane systems may experience pressure drops in extreme cold. Mobile homes are especially vulnerable to rapid heat loss.	5–10% of households experience heating failures during severe cold events.
Electrical Systems	Extreme heating demand strains power distribution. Transformers and other electrical equipment can fail in extreme cold. Tree branches weakened by cold stress may fall onto power lines, causing outages that compound heating challenges.	Power outages occur during most prolonged cold events.
Vehicles	Engines may fail to start below -20°F without engine block heaters. Batteries lose capacity, fluids thicken, and diesel fuel can gel. Cold reduces tire pressure and mechanical performance.	20–40% of vehicles experience starting difficulties during extreme cold.
Roads and Transportation	Pavement cracking occurs due to thermal stress. Ice accumulation reduces traction, and blowing snow	Regular hazard during extended



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Category	Vulnerability Description	Estimated Impact / Frequency
	decreases visibility. Emergency response times increase, and highway closures can strand motorists.	cold events and winter storms.

The entire planning area experiences heat events, with lower elevation areas having higher exposure. Highest Extreme Heat Risk Areas:

- Lower elevation valleys (Bailey, Lake George, Jefferson): Temperatures can reach 90-95°F
- South Park basin: Temperatures reach 85-90°F with intense solar radiation at altitude
- South-facing slopes: Increased solar exposure
- Urban heat islands: Limited in rural Park County but developed areas slightly warmer

Table 104. Infrastructure Vulnerability to Heat:

Category	Vulnerability Description	Estimated Impact / Frequency
Electrical Systems	High cooling demand can strain grid capacity. Transformers and distribution equipment may overheat, especially in aging systems. Power outages during heat events compound health and safety risks by disrupting cooling systems and communications.	Localized outages occur during most multi-day heat waves.
Roads and Transportation	Asphalt can soften or rut under prolonged heat. Pavement expansion may cause minor buckling (rare at Park County's elevation). Vehicle performance decreases at high temperatures and altitude.	Moderate risk during prolonged (>3-day) heat events.
Water Systems	Heat increases water demand, straining limited supplies. Warmer water temperatures affect treatment processes and quality. Combined drought and heat may lead to critical shortages in rural systems.	Supply stress and reduced water quality observed during most severe heat seasons.
Buildings	Many structures lack air conditioning due to historically mild climate. During heat events, indoor temperatures can reach unsafe levels. Mobile homes and older buildings are especially susceptible to overheating.	High risk for vulnerable populations during multi-day heat events.
Agriculture	Crops experience stress from heat and drought; forage quality declines. Livestock face heat stress, particularly in limited-shade pastures. Irrigation demand and costs increase significantly.	Crop and livestock stress recurring during annual summer heat waves.



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Essentially the entire population of Park County (17,718 residents) is exposed to extreme temperature hazards:

Extreme Cold Exposure (all residents):

- All structures: 7,000-8,500 buildings exposed to extreme cold impacts
- All vehicles: 12,000-15,000 vehicles vulnerable to cold-related failures
- All infrastructure: Water systems, roads, utilities, communications exposed

Extreme Heat Exposure (all residents):

- - All population vulnerable to heat stress, particularly vulnerable populations
- - Outdoor workers and recreationists face elevated exposure
- - Buildings without air conditioning (estimated 60-80% of structures) vulnerable

Figure 38. Extreme Temperature Vulnerability and Critical Infrastructure

[Map showing temperature-sensitive infrastructure including water systems, emergency services, vulnerable population concentrations]

Certain populations face elevated risk from extreme temperatures:

Table 105. Vulnerable populations

Population Group	Vulnerability Factors	Key Exposure / Impacts
Elderly Residents (≈4,000–5,000 age 60+)	Reduced thermoregulation capacity; chronic health conditions; may live alone; fixed incomes limit heating/cooling ability; difficulty accessing emergency services; medications affected by temperature	High vulnerability to both heat and cold; frequent medical and mobility limitations; dependent on external assistance during power outages or extreme weather
Young Children	Smaller body mass loses heat quickly; limited ability to recognize or communicate temperature stress; depend on caregivers for safety	High vulnerability to hypothermia and heat illness; rely on adult care for protection during extremes
Individuals with Chronic Health Conditions	Conditions like cardiovascular or respiratory disease and diabetes heighten sensitivity; some medications reduce thermoregulation; reliance on temperature-sensitive medications/equipment	High vulnerability during both heat and cold events; dependent on reliable power and controlled environments
Low-Income Households	Limited ability to afford adequate heating/cooling; deferred maintenance; older, poorly insulated housing; may delay medical care	Increased risk of heat or cold stress; higher likelihood of living in unsafe housing during extremes



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Population Group	Vulnerability Factors	Key Exposure / Impacts
Rural and Isolated Residents	Long emergency response times; limited backup heat; limited access to cooling centers; propane delivery delays; longer repair times for utilities	Higher exposure duration and slower recovery after events; increased isolation risk during extended cold spells
Outdoor Workers	Agricultural, ranching, construction, and utility workers with extended outdoor exposure; often work despite dangerous conditions	Direct exposure to cold or heat stress; limited rest/shelter options during high-demand work periods
Homeless or Housing-Insecure Individuals	Lack of adequate shelter; exposure to elements; difficulty locating for assistance	Direct exposure risk to hypothermia and heat illness; high mortality potential during extended events
Outdoor Recreationists	Hikers, campers, skiers, hunters exposed to rapid temperature changes; may be unprepared	High risk of hypothermia, frostbite, or heat stress, especially in remote areas with limited rescue access
Livestock and Pets	Livestock exposed to extreme cold/heat; limited shelter; companion animals left outdoors	Cold stress and mortality among livestock; frostbite in pets; heat stress reduces livestock productivity
Emergency Responders	Prolonged field exposure; increased call volume; equipment affected by temperature extremes	Fatigue, dehydration, or cold stress; operational challenges maintaining safety during extended responses

Secondary Hazards and Cascading Impacts

Extreme temperatures create multiple secondary and cascading hazards:

Infrastructure Failures:

- Water system freezing causes loss of service, fire suppression capacity
- Electrical system failures cause loss of heating/cooling, refrigeration, communications
- Heating system failures in buildings make structures uninhabitable
- Cascading failures as one system impact affects others

Increased Fire Risk:

- Extreme heat desiccates fuels increasing wildfire danger
- Frozen water systems impair firefighting capability during winter structure fires
- Equipment failures affect fire department response



Healthcare System Strain:

- Surge of temperature-related medical emergencies
- Extended transport times to hospitals in neighboring counties
- Ambulance and emergency equipment affected by temperatures
- Limited urgent care capacity in county quickly overwhelmed

Vulnerable Population Crisis:

- Elderly residents unable to maintain safe conditions
- Potential for fatalities among vulnerable populations
- Need for emergency welfare checks
- Sheltering and relocation may be required

Agricultural Impacts:

- Livestock mortality during extreme cold
- Reduced productivity and health of surviving livestock
- Crop damage from heat or cold
- Economic hardship for agricultural operations

Wildfire Ignition:

- Extreme heat combined with drought creates critical fire weather
- Multiple ignitions can overwhelm suppression resources
- See Wildfire hazard section for detailed discussion

Economic Disruption:

- Business closures during extreme events
- Tourism disruption
- Supply chain impacts if roads affected
- Energy price spikes

Psychological Impacts:

- Stress and anxiety from extreme conditions
- Isolation during extended cold periods
- Fear of infrastructure failures and inability to stay warm/cool

Compounded Risk: Extreme Temperatures and Other Hazards

Extreme temperatures interact with other hazards to create compounded risks.

Extreme Cold and Winter Storms: Combination of extreme cold with heavy snow creates compounded challenges:

- Heating systems working hard while blizzard conditions prevent service calls
- Power outages from snow/ice during extreme cold life-threatening
- Emergency response severely limited
- Stranded travelers face hypothermia risk



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Extreme Cold and Power Outages: Loss of electricity during extreme cold causes heating system failures, frozen pipes, and life-threatening conditions. December 2022 Winter Storm Elliott demonstrated this compounded risk.

Extreme Heat and Drought: Prolonged heat events combined with drought create critical conditions:

- Wildfire danger extreme
- Water supply stress
- Agricultural impacts severe
- Ecosystem stress

Extreme Heat and Wildfire: Heat creates fuel conditions conducive to fire ignition and spread. Wildfire smoke during heat events compounds health impacts.

Extreme Heat and Power Outages: Loss of cooling during extreme heat dangerous for vulnerable populations.

Temperature Extremes + Flooding: Rapid temperature changes (warm-ups melting snow, rain-on-snow events) can cause flooding. Frozen ground prevents infiltration increasing runoff.

Lifelines

Extreme temperature events impact all seven FEMA community lifelines:

Table 106. Lifelines

Essential Function	Impacts
Safety and Security	- Hypothermia and frostbite injuries and deaths during extreme cold.- Heat stroke and heat exhaustion during extreme heat.- Vehicle accidents and roadway hazards in extreme cold conditions.- Elevated wildfire danger during prolonged heat events.- Emergency response capacity strained by increased call volume and resource demand.
Food, Water, and Shelter	- Frozen water systems restricting access to potable water during extreme cold.- Increased water demand and reduced supply during extreme heat.- Heating system failures rendering homes uninhabitable during cold events.- Lack of air conditioning making structures unsafe during heat waves.- Food supply chain disruptions due to transportation and energy constraints.
Health and Medical	- Surge in temperature-related medical emergencies (heat stroke, hypothermia).- Medication stability and storage compromised by extreme temperatures.- Medical equipment performance degraded during power outages.- Access to healthcare limited in remote areas during extreme weather.- Exacerbation of chronic health conditions.
Energy	- Excessive heating demand during extreme cold causing energy strain.- Increased cooling demand during heat events stressing electrical



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Essential Function	Impacts
	infrastructure.- Equipment failures from temperature-related stress.- Fuel shortages and delivery delays during extreme cold.
Communications	- Equipment and tower failures in extreme temperatures.- Power outages disrupting communication systems.- Increased public information demand during emergencies.
Transportation	- Vehicle breakdowns and cold-weather engine failures.- Pavement damage and road surface degradation from temperature extremes.- Reduced mobility and safety risks during cold events.- Delayed emergency response and service disruptions.
Hazardous Materials	- Propane system pressure fluctuations during extreme cold.- Heat affecting storage stability of temperature-sensitive materials.- Potential increased fire and spill risks under heat stress conditions.

Interconnected Hazards

Extreme temperature hazards are interconnected with multiple other hazards in the planning area:

- Extreme Temperatures + Winter Storms: Combined extreme cold and winter storms create compounded crisis.
- Extreme Temperatures + Wildfire: Extreme heat creates conditions for wildfire ignition and spread.
- Extreme Temperatures + Drought: Heat and drought compound agricultural and water supply impacts.
- Extreme Temperatures + Infrastructure Failure: Temperature extremes cause infrastructure failures that cascade across multiple systems.
- Extreme Temperatures + Power Outages: Loss of electricity during temperature extremes creates life-threatening conditions.

Recent and Future Development

Development trends in Park County affect extreme temperature vulnerability:

- Residential Growth: Continued construction adds structures exposed to temperature extremes. New construction generally has better insulation and more efficient heating/cooling systems than older structures, but growth increases total vulnerable population and infrastructure.
- Aging Population: Park County's population continues to age, increasing the number of vulnerable individuals.
- Energy Infrastructure: Electrical distribution system expansions serve new development but aging existing infrastructure remains vulnerable to temperature-related failures.



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- Recreation Growth: Increased outdoor recreation places more people in exposed conditions, particularly backcountry users in winter facing hypothermia risk and summer users facing heat stress.

Climate Adaptation: Some adaptation occurring:

- Improved building insulation and weatherization
- More efficient heating and cooling systems
- Better water system winterization
- Enhanced public education

Mitigation Opportunities: Development trends provide opportunities for temperature resilience:

- Building codes requiring adequate insulation and efficient HVAC
- Water system design incorporating freeze protection
- Emergency shelter and cooling center planning
- Vulnerable population registry and welfare check systems
- Public education on temperature safety

Changes in Vulnerability

Since the previous HMP update, the planning area's extreme temperature vulnerability has changed:

- Increased Extreme Heat Exposure: Climate warming trends have increased frequency and intensity of extreme heat events. Heat days ($\geq 85^{\circ}\text{F}$) estimated to have increased 20-30% compared to historical averages.
- Slightly Decreased Extreme Cold Frequency: The very coldest events ($\leq -40^{\circ}\text{F}$) may be slightly less frequent, though extreme cold remains certainty every winter.
- Aging Population: Growing elderly population increases number of vulnerable individuals by estimated 15-20%.
- Improved Building Stock: Some improvements in building insulation and heating efficiency through weatherization programs and new construction standards.
- Enhanced Emergency Response: Emergency protocols for temperature extremes improved, including welfare check systems and sheltering capacity.
- Climate Awareness: Growing public awareness of temperature hazards and need for preparedness.
- Utility Infrastructure Aging: Electrical and water systems continue to age, potentially increasing vulnerability without offsetting investments.

Overall Assessment: the planning area's extreme temperature vulnerability has changed in complex ways. Extreme heat vulnerability has increased due to climate warming and aging population. Extreme cold vulnerability remains very high, though potentially slightly decreased from historical levels. Net result is likely a slight increase in overall temperature hazard risk, with particular concern for vulnerable populations and aging infrastructure.



Consequence Analysis

Table 107. Extreme Temperature Consequence Analysis

Consideration	Description
Public	Extreme temperatures threaten life safety through hypothermia, frostbite, heat exhaustion, and heat stroke. Elderly, young children, chronically ill, and low-income populations face elevated risk. Extreme cold causes an estimated 1–3 hypothermia/frostbite hospitalizations per year, while extreme heat causes 1–2 heat illness hospitalizations annually. Fatalities are rare but possible. Quality of life is severely affected during extended events. Outdoor recreation safety is diminished, and psychological stress is common during prolonged extremes.
Responders	Emergency responders face hazardous working conditions in both cold and heat. Call volume increases significantly, straining personnel and resources. Equipment performance and vehicle reliability decline under temperature extremes. Response times increase in remote or snow-impacted areas. Firefighters and outdoor personnel face heat exhaustion risks during wildfire response and summer incidents. Maintaining responder health and operational readiness is challenging during prolonged events.
Continuity of Operations (Government)	Extreme cold disrupts government operations through heating failures, frozen water systems, employee absences, and equipment malfunctions. Extreme heat increases wildfire suppression demands and may require extended EOC activations. County fleet and utility vehicle failures are more frequent during extreme cold. Energy consumption and operating costs surge, and infrastructure repair needs escalate during both extremes.
Public Confidence in Government	Effective emergency response and proactive shelter management during temperature extremes bolster public confidence. Adequate warming and cooling shelter capacity, clear public messaging, and timely infrastructure restoration are critical. Delays in restoring water systems or assisting vulnerable residents can erode trust. Transparent and equitable access to heating and cooling assistance programs is essential to maintain confidence.
Property	Extreme cold causes frozen pipes, heating system failures, and structural damage, resulting in annual property losses estimated at \$500K–\$1.5M. Extreme heat contributes indirectly to wildfire risk and degrades building systems not designed for high temperatures. Older and mobile homes are most vulnerable to cold damage. Agricultural structures and equipment are also susceptible to temperature stress.
Facilities & Infrastructure	Critical infrastructure is highly sensitive to temperature extremes. Water and wastewater systems experience freeze damage, causing service outages and costly repairs. Electrical systems are strained by heating and cooling demand, with power outages compounding risk. Road surfaces suffer cracking and deformation from thermal stress. Communication and IT systems face reliability issues. Emergency services facilities and schools may



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Consideration	Description
	suspend operations during extreme events. Estimated annual infrastructure repair costs range from \$200K–\$500K.
Environment	Temperature extremes stress ecosystems, vegetation, and wildlife. Prolonged cold causes wildlife mortality, while heat and drought compound vegetation loss and wildfire risk. Rapid temperature swings disrupt ecological balance and alter species distribution. Long-term climate warming is reshaping habitat zones and ecosystem composition in Park County.
Economic	Extreme temperatures impose major financial impacts. Extreme cold generates estimated annual costs of \$710K–\$1.85M (heating, infrastructure, agriculture, response), while extreme heat contributes \$273K–\$855K annually (cooling, wildfire, agriculture, health). Combined annual losses are approximately \$983K–\$2.71M, with major events adding \$300K–\$2M. Costs include energy use, infrastructure repair, agricultural losses, emergency operations, and medical care. Economic ripple effects include reduced tourism and productivity losses during extreme events.

Multi-Jurisdictional Concerns

Extreme temperature hazards affect the entire planning area, as temperature extremes are ubiquitous:

All participating jurisdictions share concerns about:

- Vulnerable population protection (elderly, low-income, isolated residents)
- Infrastructure winterization and temperature resilience
- Heating and cooling assistance availability
- Emergency sheltering capacity
- Water system freeze prevention
- Public education on temperature safety
- Emergency response during extreme conditions



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Table 108. Multi-Jurisdictional Extreme Temperature Assessment

Jurisdiction / Partner	Shared Temperature Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide exposure to temperature extremes; need for vulnerable population support and infrastructure protection	Large rural service area with isolated residents; aging water and utility systems; emergency response delays due to distance; limited data on vulnerable populations	Winterization of public water systems; establishment of vulnerable population registry; proactive welfare checks; public education and outreach; emergency sheltering operations
Town of Fairplay	Extreme cold exposure; elderly and low-income residents; municipal infrastructure reliability	Located within South Park basin where extreme cold is common; downtown commercial area dependent on utilities; aging water infrastructure	Water system freeze protection; vulnerable population support; continuity of municipal operations; public education on preparedness
Town of Alma	High-elevation cold exposure; limited resources; vulnerable populations	Highest elevation town in the county; historic housing stock; limited staffing and infrastructure capacity	Water system insulation and protection; community coordination for vulnerable residents; emergency planning and mutual aid participation
Platte Canyon Fire Protection District (FPD)	Temperature extremes impacting response operations and residents	Moderate cold and some heat exposure; isolated residents; water systems vulnerable to freezing	Emergency response procedures for temperature extremes; public education campaigns; identification of at-risk residents; coordination with county OEM
Lake George Fire Protection District (FPD)	Temperature extremes; emergency response coordination	Moderate cold exposure; scattered rural households; limited communications coverage	Emergency response capability enhancement; public education and outreach; protection of rural water systems
North-West Fire Protection District (FPD)	Extreme cold; remote and resource-limited service area	Sparse population; extended response times; limited heating resources	Rural emergency preparedness initiatives; welfare checks on vulnerable residents;



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Jurisdiction / Partner	Shared Temperature Concerns	Notable Vulnerabilities	2025 HMP Priorities
			mutual aid and volunteer training
South Park Ambulance District	Medical response during cold and heat extremes	Long transport times in hazardous conditions; increase in temperature-related medical calls	Emergency medical response protocol updates; winterization of vehicles; public education on cold and heat illness prevention
Hartsel Fire Protection District (FPD)	Extreme cold exposure; limited resources	Coldest area in the county; rural population; inadequate heating and water infrastructure	Emergency preparedness; warming shelter coordination; support for isolated residents
Jefferson Fire Protection District (FPD)	Seasonal temperature extremes; vulnerable population response	Moderate cold and heat exposure; dispersed population base	Emergency response readiness; public awareness programs; coordination for welfare checks
Southern Park County Fire Protection District (FPD)	Remote service area with limited emergency capacity	Rural geography; limited personnel and equipment; vulnerable rural residents	Emergency preparedness training; coordination of welfare checks; participation in mutual aid networks
Colorado Department of Human Services (CDHS)	Administration of heating and cooling assistance programs	Limited program funding; difficulties reaching remote and low-income households	Expansion of Low-Income Energy Assistance Program (LEAP); community outreach; coordination with local agencies and nonprofits
Utility Providers (e.g., Xcel Energy, Holy Cross Energy)	Service reliability during temperature extremes; protection of energy infrastructure	Equipment failure risk during extreme cold or heat; surging demand strains capacity	Infrastructure maintenance and modernization; critical customer identification; emergency communications and outage management protocols



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Hazard Summary

Table 109. Extreme Temperature Hazard Summary

Jurisdiction	Population Exposed	Critical Facilities Exposed	Estimated Annual Impact	Risk Category	Key Vulnerabilities / Notes
Park County (Total)	17,718 (100%)	All critical facilities	\$983K–\$2.71M annually	High (Certainty)	Countywide exposure to temperature extremes. South Park Basin experiences prolonged extreme cold. Vulnerable populations include elderly, isolated residents, and low-income households. Aging infrastructure and limited heating/cooling resources increase risk.
South Park Basin Communities (Fairplay, Hartsel, Guffey)	≈ 3,500–4,500	15–25	\$400K–\$1.2M annually	Very High (Cold)	Region experiences some of the most extreme cold in Colorado, with regular lows from -30°F to -50°F. Water systems and livestock highly vulnerable. Prolonged cold events strain emergency response and infrastructure.
Bailey Area (Platte Canyon FPD)	≈ 6,000–7,000	8–12	\$300K–\$800K annually	High	Moderate cold (-25°F to -40°F) with occasional heat events (90°F+). Concentrated population and commercial areas increase exposure. Water systems and older housing stock vulnerable to freeze damage.
Lake George Area	≈ 2,500	4–6	\$100K–\$300K annually	High	Experiences both cold and heat extremes. Rural population with limited resources. Infrastructure susceptible to cold-related failures and heat-related strain.
Jefferson and Outlying Areas	≈ 5,000–6,000	20–30	\$183K–\$410K annually	Moderate to High	Scattered rural populations with varying exposure. Infrastructure vulnerabilities include frozen water systems and limited emergency



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Jurisdiction	Population Exposed	Critical Facilities Exposed	Estimated Annual Impact	Risk Category	Key Vulnerabilities / Notes
					response access during extreme weather.

Table 110. Quantitative Extreme Temperature Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Total Population Exposed	17,718 (100%)	+8%
Vulnerable Population (Elderly 60+)	4,000–5,000 (23–28%)	+15–20%
Annual Days $\leq 0^{\circ}\text{F}$ (South Park)	30–60 days	Stable to slight decrease
Annual Days $\leq -20^{\circ}\text{F}$ (South Park)	10–25 days	Stable to slight decrease
Annual Days $\geq 85^{\circ}\text{F}$ (Bailey area)	5–15 days	+20–30% increase
Record Low Temperature	-61°F (Hartsel, 1985)	No change (historical record)
Record High Temperature	$95\text{--}98^{\circ}\text{F}$ (Bailey area)	No change (historical record)
Annual Cold-Related Costs	\$710K–\$1.85M	+10–15%
Annual Heat-Related Costs	\$273K–\$855K	+30–50%
Structures with Inadequate Heating	200–400 (3–5%)	Stable to slight decrease
Structures without Air Conditioning	4,200–6,800 (60–80%)	Stable to slight decrease
Water System Freeze Events	5–15 significant events annually	Stable
Extreme Cold Medical Emergencies	10–30 annually	Stable
Extreme Heat Medical Emergencies	5–15 annually	+40–60% increase
Climate Warming Trend (30-year)	+1.0–1.5 $^{\circ}\text{F}$ average temperature	Ongoing trend
Projected Heat Days Increase (by 2050)	+50–100% from current	Climate projections



Hazard: Pandemic & Infectious Disease Outbreak

Background

The planning area faces ongoing risk from pandemic and infectious disease events that can cause widespread illness, death, and societal disruption. While infectious diseases are a constant presence in human populations, pandemics—defined as disease outbreaks that spread across multiple countries or continents—represent rare but high-consequence events that can overwhelm healthcare systems, disrupt economic activity, and require extraordinary public health interventions.

The COVID-19 pandemic (2020-2023) demonstrated the significant impacts that infectious disease outbreaks can have on the planning area's small, rural communities. The pandemic caused illness and death, strained the county's limited healthcare infrastructure, disrupted education and commerce, created economic hardship, and highlighted vulnerabilities in emergency preparedness systems. While COVID-19 was the most significant pandemic event in recent history, the planning area also faces ongoing risks from seasonal influenza, emerging infectious diseases, vector-borne diseases, and zoonotic diseases (diseases transmitted from animals to humans).

The planning area's rural character creates unique challenges and vulnerabilities regarding infectious disease. The county has limited healthcare infrastructure, with no hospital located within county boundaries and limited urgent care and primary care facilities. Residents must travel to neighboring counties (Jefferson, Park, Teller, or Chaffee) for hospital-level care, creating access challenges during widespread outbreaks. The county's aging population (median age higher than state average) creates elevated vulnerability, as elderly individuals face higher risk of severe illness and death from many infectious diseases.

However, the planning area's rural character also provides some protective factors. Low population density reduces transmission rates compared to urban areas, dispersed settlement patterns limit exposure in many settings, and the outdoor-oriented lifestyle provides opportunities for social distancing. The county's experience with COVID-19 demonstrated both these challenges and protective factors, with transmission rates generally lower than urban counties but significant impacts when outbreaks occurred in congregate settings or during periods of increased social interaction.

Infectious disease events create multiple impacts in the planning area: illness and death affecting residents and visitors; healthcare system strain with limited local capacity quickly overwhelmed; economic disruption to businesses, tourism, and government operations; educational disruption when schools close or shift to remote learning; social isolation and mental health impacts, particularly for elderly residents; supply chain disruptions affecting availability of essential goods; and long-term health consequences for individuals recovering from serious infections.

Park County's limited public health infrastructure—public health services provided through the Colorado Department of Public Health and Environment's regional office rather than a dedicated county health department—creates additional challenges for disease surveillance, outbreak response, and public education. The county relies heavily on coordination with state health officials, neighboring counties, and federal agencies for infectious disease preparedness and response.



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Pandemic and infectious disease ranked among the hazards of concern in the planning area based on the 2025 Hazard Ranking Worksheet, reflecting the demonstrated impacts of COVID-19, ongoing risk from seasonal and emerging diseases, and the county's healthcare and public health infrastructure limitations.

Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan, the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO) for the purposes of consistency and alignment with state and federal public health efforts.

- **Infectious Disease:** An illness caused by pathogenic microorganisms such as bacteria, viruses, parasites, or fungi. Infectious diseases can spread directly or indirectly from person to person, through vectors (such as mosquitoes or ticks), through contact with contaminated surfaces or substances, or from animals to humans (zoonotic transmission).
- **Epidemic:** The occurrence of disease cases in excess of normal expectancy in a specific geographic area or population. An epidemic is typically limited to a localized area or specific population group.
- **Pandemic:** An epidemic that has spread across multiple countries or continents, affecting a large number of people. Pandemics represent widespread disease transmission on a global scale and typically involve novel pathogens to which populations have limited immunity.
- **Outbreak:** The occurrence of disease cases in excess of what would normally be expected in a defined community, geographical area, or season. Outbreaks may involve a small number of cases but represent unusual disease activity.
- **Community Transmission:** When the source of infection for cases cannot be traced to known contacts, indicating widespread circulation of disease within a community.
- **Zoonotic Disease:** An infectious disease that is transmitted from animals to humans. Examples include rabies, hantavirus, plague, and many emerging infectious diseases.
- **Vector-Borne Disease:** An infectious disease transmitted by vectors—living organisms that carry pathogens between humans or from animals to humans. Examples include West Nile virus (transmitted by mosquitoes), plague (transmitted by fleas), and Lyme disease (transmitted by ticks).
- **Healthcare System Surge:** A situation in which healthcare demand exceeds available capacity, requiring extraordinary measures such as expanding treatment areas, postponing elective procedures, implementing crisis standards of care, or transferring patients to other facilities.
- **Quarantine:** The separation and restriction of movement of people who were exposed to a contagious disease to determine if they become sick. Quarantine applies to individuals who are not yet ill.
- **Isolation:** The separation of people who are sick with a contagious disease from those who are not sick. Isolation applies to individuals who are ill and can transmit disease.



- **Social Distancing:** Public health measures designed to reduce contact between people to slow disease transmission. Measures may include staying at home, avoiding crowds, maintaining physical distance from others, and limiting face-to-face contact.
- **Personal Protective Equipment (PPE):** Specialized equipment worn by healthcare workers and others to protect against infectious disease transmission. Examples include masks, gloves, gowns, face shields, and respirators.
- **Public Health Emergency:** A declaration by public health authorities indicating that extraordinary measures are necessary to protect public health. Declarations can occur at local, state, or federal levels and enable activation of emergency powers and resources.

Location and Extent

Infectious disease hazards affect the entire planning area, with risk factors varying based on disease characteristics, transmission modes, population characteristics, and community settings.

The entire planning area is vulnerable to infectious disease outbreaks, with some variation based on population density, social interaction patterns, and healthcare access:

Higher Population Density Areas: Communities with relatively higher population density, including Bailey, Fairplay, and Lake George, face somewhat elevated transmission risk during outbreaks due to increased social interaction, shared community spaces, and congregate settings (schools, businesses, churches, community centers).

Rural and Dispersed Areas: Remote areas with low population density (much of South Park basin, Guffey area, mountain subdivisions) benefit from natural social distancing but face challenges accessing healthcare, testing, and public health resources during outbreaks.

Tourist and Recreation Areas: Locations with high visitor traffic (Highway 285 corridor, mountain recreation areas, fishing and hunting destinations) experience population influx that can introduce infectious diseases and complicate contact tracing and outbreak control.

Congregate Settings: Specific locations where people gather in close proximity represent higher-risk settings for disease transmission:

- Schools (5 public schools in Park County)
- Churches and community centers
- Grocery stores and essential businesses
- Restaurants and bars (when open)
- Government offices
- Outdoor recreation gathering points
- Assisted living and long-term care facilities (limited capacity in county)



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Park County has no hospital within its boundaries. Residents requiring hospitalization must travel to:

- Swedish Medical Center (Jefferson County) - approximately 40-60 minutes from northern Park County
- UCHealth Pikes Peak Regional Hospital (Teller County) - approximately 45-75 minutes from southern Park County
- Heart of the Rockies Regional Medical Center (Chaffee County) - approximately 60-90 minutes from western Park County
- St. Anthony Summit Medical Center (Summit County) - approximately 45-75 minutes from northern Park County

Limited Urgent and Primary Care: Park County has limited local healthcare facilities:

- Platte Canyon Medical Clinic (Bailey)
- South Park Medical Clinic (Fairplay)
- Limited urgent care capacity
- No emergency department in county
- Visiting healthcare providers in some locations
- Telehealth services increasingly available

EMS and Transport: South Park Ambulance District provides emergency medical services countywide. Extended transport times to hospitals create challenges during widespread outbreaks when transport demand increases.

No Local Public Health Department: Public health services are provided through the Colorado Department of Public Health and Environment (CDPHE) regional office rather than a dedicated Park County health department. This creates:

- Limited local disease surveillance capacity
- Dependence on state-level outbreak investigation and response
- Challenges with community-specific public health messaging
- Limited local public health workforce for outbreak response

Figure 39. Park County Healthcare Access and Vulnerable Populations

[Map showing healthcare facilities, population centers]

Several population characteristics in the planning area affect infectious disease vulnerability:

- Age Distribution: Park County has a median age higher than Colorado's average, with significant elderly population (approximately 25-30% of residents age 60+). Elderly individuals face higher risk of severe illness, hospitalization, and death from many infectious diseases including influenza and COVID-19.
- Chronic Health Conditions: Prevalence of chronic health conditions (cardiovascular disease, diabetes, respiratory conditions, immunocompromising conditions) that increase risk of severe outcomes from infectious diseases.
- Healthcare Access Barriers: Rural location limited local healthcare, and long travel distances to hospitals create access challenges during outbreaks.



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- Economic Vulnerability: Some residents face economic constraints affecting ability to:
 - Access healthcare and medications
 - Take time off work when ill
 - Comply with quarantine or isolation guidance

Obtain personal protective equipment and sanitation supplies

- Seasonal Population Fluctuations: Park County experiences population fluctuations due to tourism and seasonal residents, complicating disease surveillance and creating potential for disease introduction during high-visitation periods.
- Limited Broadband Access: Some rural areas have limited internet access, creating challenges for telehealth, remote work, distance learning, and accessing public health information during outbreaks.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, infectious disease and pandemic risks are significant concerns statewide. The COVID-19 pandemic demonstrated that infectious diseases can overwhelm healthcare systems, disrupt economic activity, and require sustained emergency response across all Colorado counties. The State HMP notes that rural counties like Park face unique challenges:

- Limited healthcare infrastructure and hospital capacity
- Smaller public health workforce
- Difficulty attracting and retaining healthcare providers
- Longer transport times to definitive care
- Economic dependence on tourism that may conflict with disease control measures
- Aging populations with elevated vulnerability

However, rural counties also demonstrated some advantages during COVID-19:

- Lower population density reducing transmission rates
- Strong community connections enabling mutual aid
- Outdoor-oriented lifestyles supporting natural social distancing
- Less reliance on public transportation and shared spaces

Park County's experience with COVID-19 was generally consistent with other rural Colorado mountain counties, with lower per-capita case rates than urban counties but significant impacts when outbreaks occurred, particularly affecting elderly residents and stressing limited healthcare capacity.

Figure 40. Statewide Pandemic and Infectious Disease Risk Context

[State-level map showing healthcare infrastructure, vulnerable populations, and COVID-19 impact patterns]



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Previous Occurrences

Park County has experienced several infectious disease events over the past several decades, with the COVID-19 pandemic representing the most significant event in modern history. Documentation of infectious disease events is derived from Colorado Department of Public Health and Environment records, Centers for Disease Control and Prevention data, local emergency management reports, healthcare facility records, and media accounts.

Table 111. Previous Occurrences (Major Infectious Disease Events)

Event	Time Period	Disease	Cases (Park County)	Deaths (Park County)	Impacts / Notes
COVID-19 Pandemic	March 2020 – 2023 (ongoing endemic)	SARS-CoV-2 (COVID-19)	4,000+ confirmed (likely undercounted)	40–50 deaths	Major pandemic; widespread illness; healthcare system strain; economic disruption; school closures; lasting public health impacts.
H1N1 Influenza Pandemic	2009–2010	Influenza A (H1N1)	Estimated 800–1,200 (many unreported)	0–2	Global pandemic; moderate local impact; school outbreaks; limited healthcare strain.
Seasonal Influenza Outbreaks	Annual (ongoing)	Influenza (various strains)	500–1,500 per year (many unreported)	0–5 per year	Annual occurrence; variable severity; elderly and chronically ill most affected; periodic school and workplace outbreaks.
West Nile Virus Cases	Sporadic (2003–present)	West Nile Virus (mosquito-borne)	0–2 per year (most years zero)	0–1 (rare)	Sporadic cases; mosquito surveillance ongoing; most infections asymptomatic or mild.
Hantavirus Cases	Rare (various years)	Hantavirus Pulmonary Syndrome	<5 total in past 20 years	0–2	Rare but severe; transmitted via rodent droppings; rural/outdoor



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Event	Time Period	Disease	Cases (Park County)	Deaths (Park County)	Impacts / Notes
					exposure risk; limited person-to-person transmission.
Pertussis (Whooping Cough) Outbreaks	Periodic (e.g., 2012, 2019)	Bordetella pertussis	5–15 during outbreak years	0	Periodic outbreaks; concerning for infants; prevention dependent on vaccination.
Norovirus Outbreaks	Sporadic (various years)	Norovirus (gastrointestinal)	10–30 per outbreak	0	Occur in schools, gatherings, and care facilities; highly contagious but short duration.
Giardiasis Cases	Ongoing (endemic)	Giardia lamblia (waterborne)	5–15 per year	0	Endemic across Colorado; associated with untreated or surface water exposure; recreation-related risk.
Tick-Borne Diseases	Sporadic (increasing)	Colorado Tick Fever, rare Lyme Disease	0–3 per year	0	Limited incidence; Colorado Tick Fever endemic; Lyme emerging; linked to outdoor exposure.
Rabies Exposure Events	Sporadic (ongoing)	Rabies virus (zoonotic)	Several potential exposures annually; no human cases	0	Wildlife rabies (bats, skunks, foxes) present; domestic vaccination critical; post-exposure prophylaxis administered as needed.

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, represents the most significant infectious disease event in Park County's modern history. The pandemic affected virtually all aspects of county life and continues to have ongoing impacts.



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Table 112. COVID-19 Pandemic Timeline and Milestones (Park County)

Date / Period	Event / Milestone	Impact
March 2020	First confirmed COVID-19 cases in Park County	Public alarm; implementation of statewide public health orders; initial emergency coordination.
March 26 – April 26, 2020	Colorado Stay-at-Home Order	Business and school closures; significant economic and social disruption; community assistance efforts mobilized.
Spring–Summer 2020	Phased reopening with restrictions	Gradual resumption of activities; capacity limits, mask requirements, and public health compliance measures in effect.
Fall–Winter 2020–2021	Major surge in cases and deaths	Healthcare system strain; highest hospitalization and mortality rates of pandemic; resource and staffing shortages.
December 2020	Vaccine availability begins (healthcare workers, elderly)	Marked turning point; logistical challenges in rural vaccine distribution; prioritization of vulnerable populations.
Spring 2021	Vaccine eligibility expands to all adults	Increasing vaccination rates; case decline; reopening acceleration; renewed community engagement.
Summer 2021	Most restrictions lifted; return to near-normal operations	Economic recovery begins; social gatherings resume; continued public debate on masking and vaccine mandates.
Fall–Winter 2021–2022	Delta and Omicron variant surges	Very high case counts; reduced severity due to vaccination; sustained healthcare and public health workload.
2022–2023	Transition to endemic phase	Ongoing circulation; periodic case increases; normalization of daily life; continued booster campaigns and preparedness efforts.

Park County experiences annual influenza (flu) season, typically peaking January through March. Seasonal flu creates recurring impacts:



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Table 113. Flu Season

Flu Season Type	Characteristics	Estimated Cases	Estimated Deaths	Key Impacts
Typical Flu Season	Annual occurrence with variable strain severity and vaccine effectiveness.	500–1,500 cases annually (many unreported).	0–5 deaths per year, primarily among elderly or chronically ill.	Moderate school and workplace absenteeism; limited healthcare system strain during peak weeks; economic impacts minimal.
Severe Flu Season	Occurs approximately every 3–5 years with widespread illness and severe strains.	2,000+ cases.	5–10 deaths possible.	School closures occasionally considered; significant strain on healthcare system; increased absenteeism; measurable local economic disruption.

Several infectious diseases represent ongoing or emerging concerns for Park County:

- **Zoonotic Diseases:** Diseases transmitted from animals to humans pose ongoing risk in Park County's rural environment:
- **Hantavirus:** Rare but serious; transmitted through rodent droppings; highest risk in rural structures with rodent infestations
- **Rabies:** Wildlife rabies endemic in Colorado; bats, skunks, foxes primary vectors; domestic animal vaccination critical
- **Plague:** Endemic in Colorado; transmitted by fleas from infected rodents; rare human cases but present in environment
- **Tularemia:** Occasionally identified; transmitted through contact with infected animals or insect bites

Vector-Borne Diseases: Diseases transmitted by mosquitoes, ticks, and fleas:

- **West Nile Virus:** Mosquito-borne; sporadic cases; mosquito surveillance and control ongoing
- **Colorado Tick Fever:** Endemic in Colorado mountains; transmitted by ticks; generally mild illness
- **Lyme Disease:** Rare in Colorado but emerging; tick-borne; early detection and treatment important
- **Plague:** As noted above; flea-borne from infected rodents



Waterborne Diseases:

- Giardiasis: Endemic; transmitted through contaminated water; outdoor recreation exposure
- Cryptosporidiosis: Occasional cases; waterborne parasite
- Campylobacter: Bacterial infection; can be waterborne or foodborne

Respiratory Diseases:

- Seasonal Influenza: Annual occurrence as discussed above
- COVID-19: Ongoing endemic circulation
- RSV (Respiratory Syncytial Virus): Particularly concerning for infants and elderly
- Pertussis (Whooping Cough): Periodic outbreaks; vaccination important

Foodborne Diseases:

- Norovirus: Highly contagious; occasional outbreaks
- Salmonella, E. coli, Campylobacter: Sporadic cases; typically associated with contaminated food
- Generally linked to specific food sources or events rather than community-wide outbreaks

Disaster Declarations

The COVID-19 pandemic resulted in federal, state, and local disaster declarations:

Table 114. Disaster Declarations (Pandemic and Infectious Disease)

Event	Year	Declaration	Scope	Impacts
COVID-19 Pandemic	2020	Federal Emergency Declaration (Nationwide)	National	Authorized federal emergency assistance and funding under the Stafford Act; enabled FEMA resource deployment and interagency coordination.
COVID-19 Pandemic	2020–2023	Colorado State of Emergency	Statewide	Enabled activation of state emergency powers; issuance of public health orders; resource allocation for testing, vaccination, and public communication.
COVID-19 Pandemic	2020–2023	Park County Local Emergency Declaration	Countywide	Enabled activation of local emergency powers; facilitated coordination with state and federal response agencies; provided access to emergency funding and logistical support.



These declarations enabled:

- Federal emergency funding (FEMA, HHS, CARES Act, American Rescue Plan)
- State emergency public health orders
- Deployment of state and federal resources (testing supplies, PPE, vaccines, personnel)
- Activation of emergency operations centers
- Suspension of normal procedures to expedite response
- Access to emergency purchasing authorities
- Liability protections for healthcare providers and emergency responders

No other infectious disease events in the planning area's recent history have triggered disaster declarations, reflecting the unprecedented nature and severity of the COVID-19 pandemic.

Probability of Future Occurrence

Infectious disease events, including both routine seasonal diseases and potential pandemic events, will continue to affect the planning area with certainty.

Seasonal Infectious Diseases: 100% annual probability

- Seasonal influenza occurs every year
- Gastrointestinal illnesses (norovirus, etc.) occur annually
- Waterborne diseases occur annually in small numbers
- Zoonotic disease exposures occur annually

Minor Infectious Disease Outbreaks (affecting <50 people): 80-90% annual probability

- School or workplace outbreaks of influenza, norovirus, or other common diseases
- Generally limited geographic and population scope
- Managed through routine public health measures

Moderate Infectious Disease Outbreaks (affecting 50-200 people): 30-50% annual probability

- Larger outbreaks of influenza or other common diseases
- May require enhanced public health intervention
- Typically occur during particularly severe disease seasons

Major Infectious Disease Outbreak (affecting 200+ people, not rising to pandemic): 10-20% annual probability

- Severe influenza season affecting significant portion of population
- Widespread outbreak of common disease requiring substantial public health response
- May strain healthcare system but does not constitute pandemic



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Pandemic (novel pathogen with global spread): 1-5% annual probability

- Based on historical pandemic frequency (3-4 pandemics per century)
- COVID-19 demonstrated that pandemics occur and can have severe impacts
- Next pandemic's timing, severity, and characteristics unknown
- Probability low in any given year but certainty of occurrence over longer timeframes

Influenza Pandemic: 1-3% annual probability

- Influenza pandemics occur approximately every 10-50 years historically
- Novel influenza strains continue to emerge
- H1N1 (2009) and COVID-19 (2020) demonstrate ongoing pandemic risk

Coronavirus Pandemic (similar to COVID-19): 1-2% annual probability

- Multiple coronaviruses (SARS, MERS, COVID-19) have emerged in recent decades
- Zoonotic spillover from animals to humans continues
- COVID-19 demonstrated pandemic potential of coronaviruses

Other Novel Pathogen Pandemic: <1% annual probability

- Emergence of entirely new or re-emerging pathogen
- Historical examples include HIV/AIDS, Ebola outbreaks, others
- Difficult to predict but scientifically plausible

Endemic COVID-19 Surges: 80-100% annual probability

- COVID-19 continues to circulate in endemic pattern
- Periodic case increases likely, particularly fall/winter
- Severity reduced by vaccination and prior infection but some impacts continue

Vector-Borne Disease Increase: Increasing probability (currently 5-15% annual probability of notable increase)

- Climate warming may expand geographic range and season length for vectors
- West Nile Virus, tick-borne diseases may increase
- Enhanced surveillance needed

Future Trends:

Several factors influence future infectious disease risk in the planning area:

- Global travel and connectivity enable rapid disease spread
- Climate change may alter vector ranges and disease patterns
- Aging population increases vulnerable population
- Antimicrobial resistance makes some diseases harder to treat
- Zoonotic spillover continues as human-animal interface changes
- Potential for bioterrorism or laboratory accidents (though very low probability)



Factors Decreasing Risk or Impact:

- Improved disease surveillance and early warning systems
- Rapid vaccine development capability (demonstrated by COVID-19 vaccines)
- Enhanced public health infrastructure and preparedness (post-COVID improvements)
- Telemedicine expansion enabling remote healthcare access
- Improved public awareness and preparedness
- Stronger infection prevention and control measures

Overall Assessment: The planning area will continue to face infectious disease threats, including:

- Annual seasonal diseases with virtual certainty
- Periodic outbreaks requiring enhanced public health response
- Low but present probability of another pandemic in any given year
- Near certainty of another pandemic occurring within next 20-50 years

Preparedness, surveillance, and rapid response capabilities are critical for minimizing impacts of future infectious disease events.

Future Costs

Economic impacts from infectious disease events in the planning area vary dramatically based on the scale and severity of the outbreak. Costs include direct healthcare costs, public health response costs, economic disruption, and long-term societal impacts.

Based on typical years with seasonal influenza and routine infectious disease activity:

Table 115. Seasonal Influenza and Ind Influenza Costs

Category	Description	Estimated Annual Cost
Healthcare Costs	Medical treatment for seasonal flu and other infections	\$300,000 – \$600,000
	Vaccinations and preventive care	\$50,000 – \$100,000
	Laboratory testing and diagnostics	\$30,000 – \$60,000
Productivity and Economic Costs	Lost work productivity from illness	\$400,000 – \$800,000
	School absenteeism impacts	\$50,000 – \$100,000
	Business impacts from reduced consumer activity during illness surges	\$100,000 – \$200,000



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Category	Description	Estimated Annual Cost
Public Health and Emergency Response	Disease surveillance and monitoring	\$20,000 – \$40,000
	Public education and outreach	\$10,000 – \$20,000
	Emergency preparedness planning	\$15,000 – \$30,000
Total Estimated Annual Routine Infectious Disease Costs	—	\$975,000 – \$1,950,000

These costs represent "background" infectious disease burden occurring annually even without major outbreaks or pandemics. Severe influenza season or significant outbreak affecting 500-1,000 people (occurs approximately every 3-5 years):

Table 116. Pandemic Costs

Category	Description	Estimated Additional Cost per Event
Additional Healthcare Costs	Increased medical visits, treatments, and hospitalizations; additional testing and diagnostics; surge staffing and overtime	\$200,000 – \$500,000
Additional Economic Costs	Increased absenteeism and lost productivity; business revenue losses during outbreak peaks; school closure costs if implemented	\$300,000 – \$700,000
Additional Public Health Response	Enhanced surveillance and investigation; public communication and education campaigns; outbreak control measures	\$50,000 – \$150,000
Total Major Outbreak Additional Costs	—	\$550,000 – \$1,350,000 per event

The COVID-19 pandemic demonstrated that pandemic costs can be orders of magnitude higher than routine infectious disease costs. While exact figures for Park County are difficult to calculate comprehensively, the pandemic created substantial impacts:



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Table 117. COVID-19 Pandemic Estimated Costs (Park County, 2020-2023)

Category	Description	Estimated Cost (3-Year Total)
Direct Healthcare Costs	Testing, treatment, hospitalization, vaccination campaigns, PPE and supplies, and healthcare system modifications	\$3–5 million
Public Health Response	Emergency operations center activation (extended duration), contact tracing, public communication and education, testing and vaccination clinics, coordination with state/federal agencies	\$1–2 million
Economic Impacts	Business revenue losses from closures and restrictions, unemployment and lost wages, tourism decline, supply chain disruptions, and tax revenue losses (partially offset by federal/state assistance)	\$15–30 million
Educational Impacts	Remote learning technology and infrastructure, educational disruption and remediation, childcare challenges affecting workforce participation	\$2–4 million
Social and Health Impacts	Mental health strain, substance abuse, domestic violence, social isolation among elderly, long COVID, and mortality losses (difficult to quantify monetarily)	Qualitative – Not Monetized
Total Estimated COVID-19 Pandemic Costs	—	\$21–41 million (2020–2023)

These figures are estimates and do not capture all impacts. Some costs (such as federal assistance, state public health support) were borne by other entities. However, the pandemic created substantial direct and indirect costs for Park County government, businesses, individuals, and society.

Future pandemics could create similar or greater impacts depending on pathogen characteristics (transmissibility, severity, case fatality rate), population susceptibility, and public health response effectiveness. Assuming another pandemic of COVID-19 severity or greater within next 20-50 years:

Estimated Future Pandemic Costs: \$25-50 million

- Adjusted for population growth, property values, and inflation
- Could be substantially higher if pathogen more severe than COVID-19
- Could be lower if response more effective and pathogen less severe



Table 118. Infectious Disease Future Costs Summary

Scenario	Frequency	Estimated Costs	Notes
Routine Infectious Diseases	Annual	\$1.0M–\$2.0M per year	Seasonal influenza, gastrointestinal, and vector-borne illnesses; recurring annual public health burden.
Major Outbreak (Non-Pandemic)	Every 3–5 years	\$0.6M–\$1.4M per event	Severe influenza season or localized outbreak (e.g., pertussis, norovirus, West Nile); moderate healthcare and economic disruption.
Pandemic (COVID-19-Level Severity)	Once per 20–50 years	\$25M–\$50M per event	Extended duration, large-scale societal and economic disruption; sustained healthcare and public health response.
Pandemic (Higher Severity)	Unknown frequency	\$50M+ per event	Catastrophic pandemic scenario with high mortality, long-term economic damage, and prolonged emergency operations.

These annualized figures help communicate the expected burden over time, though actual costs in any given year may be much lower (routine disease years) or much higher (outbreak or pandemic years). Investments in pandemic and infectious disease preparedness show highly favorable cost-benefit ratios:

- **Enhanced Public Health Capacity:** For every \$1 invested in public health infrastructure and preparedness, studies suggest \$5-15 in prevented losses during outbreaks and pandemics.
- **Vaccination Programs:** Influenza vaccination programs have benefit-cost ratios of 2:1 to 3:1, preventing illness, reducing healthcare costs, and maintaining productivity.
- **Healthcare System Capacity:** Investments in healthcare system surge capacity, including PPE stockpiles, backup staffing plans, and flexible facilities, have benefit-cost ratios of 3:1 to 8:1 during pandemics.
- **Emergency Preparedness Planning:** Minimal cost (staff time primarily) with substantial benefits through improved coordination and faster, more effective response.



Risk and Vulnerability

Pandemic and infectious disease risk in the planning area is driven by pathogen characteristics, population vulnerability, healthcare system capacity, and public health infrastructure.

Park County faces several factors that influence infectious disease risk:

Table 119. Infectious Disease Risk Factors

Category	Description
Population Vulnerability	• Aging population with elevated disease risk • High prevalence of chronic health conditions • Healthcare access barriers in rural and low-income areas • Economic vulnerability limits ability to seek care • Limited health literacy among some residents
Healthcare System Limitations	• No hospital located within Park County • Limited primary and urgent care services • Extended transport times to nearest hospitals (outside county) • Small healthcare workforce and limited surge capacity • No local public health department; reliance on regional or state support
Geographic and Social Factors	• Rural, low-density population provides some protection but limits access to care • Tourism introduces transient populations and potential disease vectors • Seasonal population fluctuations affect surveillance and resource planning • Limited public transportation reduces exposure but hinders healthcare access • Outdoor recreation lifestyle supports natural distancing behaviors
Community Factors	• Strong community ties enable mutual aid but may facilitate spread during gatherings • Small population increases proportional outbreak impact • Schools, churches, and community centers serve as potential transmission hubs • Limited commercial venues concentrate interactions in few public spaces
Population and Property Exposure	Entire population of 17,718 residents is exposed to infectious disease risk, though vulnerability varies by demographic and socioeconomic factors.
High Vulnerability Populations	• Elderly residents (≈4,000–5,000 age 60+): highest mortality risk • Individuals with chronic diseases (≈3,000–4,000): increased complications • Immunocompromised individuals (≈200–400): high severity risk • Unvaccinated or under-vaccinated individuals • Healthcare workers and first responders: occupational exposure risk
Moderate Vulnerability Populations	• Middle-aged adults with chronic health issues • Residents facing healthcare access or economic barriers • Remote rural residents far from medical services • Seasonal residents lacking established healthcare connections



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Category	Description
Lower Vulnerability Populations	• Healthy younger adults• Individuals with reliable healthcare access• Vaccinated and health-conscious populations

However, novel pathogens (like SARS-CoV-2) can affect all populations, including previously healthy individuals, as demonstrated by COVID-19.

Healthcare and Public Health Infrastructure:

- Platte Canyon Medical Clinic (Bailey): Primary healthcare facility for northern Park County
- South Park Medical Clinic (Fairplay): Primary healthcare facility for South Park basin
- South Park Ambulance District: Countywide EMS services
- Limited capacity means any significant outbreak quickly overwhelms local resources

Emergency Services:

- Fire protection districts: First responders at risk of exposure; needed for emergency response during outbreaks
- Law enforcement: Needed for maintaining order; at risk of exposure
- Emergency operations center: Critical for coordinating pandemic response

Essential Services:

- Grocery stores and pharmacies: Essential during pandemics; workers at elevated exposure risk
- Utilities (water, electricity, telecommunications): Must maintain operations during pandemics
- Government services: Must continue to provide essential services
- Waste management: Critical for sanitation and disease prevention

Educational Facilities:

- Five public schools: Potential for disease transmission; also serve as community resources for information and support
- Libraries and community centers: Information resources; potential gathering places
- Childcare facilities: Essential for working parents; potential for disease transmission

Economic Infrastructure:

- Tourism businesses: Major economic sector vulnerable to pandemic impacts
- Retail and service businesses: Essential services must remain open; non-essential businesses face closure or restrictions
- Construction and trades: Essential for maintaining infrastructure
- Agricultural operations: Food security and local economy

Figure 41. Pandemic Vulnerability and Critical Infrastructure

[Map showing healthcare facilities, high-vulnerability population areas, and critical infrastructure]



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Certain populations face elevated risk from infectious diseases and pandemics:

Table 120. Vulnerable Populations Pandemic

Population Group	Primary Vulnerabilities
Elderly Residents	• Highest risk of severe illness, hospitalization, and mortality from infectious diseases • Often live alone or with limited support networks • Technology barriers limit access to telehealth or information • Fixed incomes restrict ability to maintain medical supplies or preparedness • High prevalence of chronic health conditions • Increased risk of social isolation during public health restrictions
Individuals with Chronic Health Conditions	• Pre-existing conditions (cardiovascular, respiratory, diabetes, cancer, immunocompromising diseases) increase risk • Routine care interruptions during outbreaks can worsen health • Medication access challenges (refrigeration, pharmacy closures) • Fear of infection may delay necessary care
Healthcare Workers and First Responders	• Elevated exposure to infectious agents during response • Burnout and psychological stress during prolonged events • Limited local staffing magnifies impact of illness among responders • PPE shortages and safety concerns • Balancing personal and professional responsibilities under duress
Low-Income Individuals and Families	• Economic barriers to healthcare access • High-exposure service jobs with limited paid leave • Inability to isolate or quarantine without income loss • Limited remote work options • Crowded or multi-family housing increases exposure risk • Food and supply insecurity during prolonged events
Rural and Isolated Residents	• Long travel times to medical care • Limited access to testing, vaccination, and treatment • Internet and cell service barriers hinder telehealth • Propensity to delay seeking care due to distance or cost • Reduced ability for emergency transport during severe outbreaks
Individuals Experiencing Housing Insecurity	• Lack of stable housing prevents effective isolation or quarantine • Limited access to hygiene, sanitation, and healthcare • May avoid seeking help due to stigma or enforcement fears • Extremely vulnerable during outbreaks or shelter closures
School-Age Children and Families	• Educational disruption from school closures • Childcare challenges impact workforce participation • Technology and internet barriers to remote learning • Social and emotional impacts of isolation • Loss of school-based nutrition programs increases food insecurity
Essential Workers	• Continued public-facing work increases exposure risk • May lack PPE or adequate safety protocols • Struggle to balance personal health risk with community service needs • Critical for continuity of supply chains, utilities, and food services



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Population Group	Primary Vulnerabilities
Individuals with Limited English Proficiency	• Language barriers hinder understanding of public health guidance • Difficulty navigating healthcare and vaccination systems • Cultural barriers may affect trust and compliance with safety measures
Individuals with Disabilities	• Dependence on caregivers or medical equipment increases exposure and continuity risks • Difficulty isolating independently • Challenges accessing or navigating healthcare facilities • Cognitive or sensory limitations complicate compliance with mitigation measures (e.g., masks, distancing)

Secondary Hazards and Cascading Impacts

Infectious disease events, particularly pandemics, create multiple secondary hazards and cascading impacts:

Table 121. Secondary Hazards

Category	Key Consequences
Healthcare System Overwhelm	• Hospital capacity exceeded, leading to crisis standards of care • Delayed or unavailable treatment for non-infectious conditions (e.g., trauma, cardiac, oncology) • Healthcare worker illness and burnout reduce capacity further • Shortages of critical medical supplies and equipment • Ethical dilemmas over allocation of limited resources
Economic Collapse or Severe Recession	• Widespread business closures and bankruptcies • Unemployment and income loss across sectors • Housing insecurity and eviction risk increase • Demand surge on social services and food assistance • Local government revenue decline affecting essential operations • Prolonged recovery period following crisis
Social Disruption	• School closures disrupt education and childcare • Cancellation of community events and gatherings • Heightened social isolation and loneliness • Breakdown of community networks and routines • Conflict or polarization over public health measures • Mistrust of authorities and misinformation proliferation
Mental Health Crisis	• Significant increases in anxiety, depression, and post-traumatic stress • Higher rates of substance abuse and overdose • Escalation in domestic violence and family stressors • Increased suicide risk across demographics • Dual healthcare demand for infectious and behavioral health services • Long-term psychological and emotional impacts
Supply Chain Disruptions	• Food, fuel, and medical supply shortages • Shortfalls in PPE, pharmaceuticals, and healthcare equipment • Consumer goods scarcity and price inflation • Panic buying and hoarding exacerbate shortages • Increased logistical costs and transportation bottlenecks



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Category	Key Consequences
Civil Unrest or Crime	• Economic stress may increase theft and property crime • Social unrest possible due to restrictions or perceived inequities • Enforcement challenges for public health orders • Risk of scapegoating, discrimination, or violence • Increased domestic violence and child abuse incidents
Breakdown of Essential Services	• Utility operations (electric, water, wastewater) affected by staff illness • Waste management and sanitation disruptions • Reduced transportation and public transit capacity • Communication network congestion from increased usage • Agricultural and food distribution system interruptions
Mortality and Population Health	• Elevated deaths from infectious disease • Secondary mortality from delayed or denied healthcare • Chronic post-infection health impacts (e.g., “Long COVID”) • Years of life lost and decreased life expectancy • Long-term disability or diminished quality of life for survivors
Political and Institutional Impacts	• Strain on governance and fiscal stability • Public health authority and mandate challenges • Coordination breakdowns between federal, state, and local levels • Spread of misinformation undermining effective response • Erosion of institutional trust and civic engagement • Long-term shifts in policy and public attitudes toward government authority

Infectious disease events can interact with other hazards to create compounded risks:

Table 122. Compounded Risks

Compound Hazard Scenario	Key Impacts and Interactions
Pandemic + Severe Winter Weather	• Severe storms restrict mobility and further limit access to healthcare services • Power outages make “shelter-in-place” guidance difficult to follow • Delivery of essential goods and medical supplies disrupted • Emergency response times extended due to hazardous travel conditions
Pandemic + Wildfire	• Evacuation and sheltering operations conflict with infectious disease control measures • Smoke exposure worsens respiratory conditions, including COVID-19 and influenza impacts • Healthcare systems face simultaneous surges from both hazards • Public health and emergency management resources divided between competing incidents
Pandemic + Economic Recession	• Economic decline reduces household ability to afford healthcare, supplies, and insurance • Business closures and job losses accelerate overall economic deterioration • Reduced local government revenue limits response and recovery funding • Prolonged recovery periods increase community vulnerability
Pandemic + Extreme Temperatures	• Heat waves or extreme cold increase hospitalizations during pandemic periods • Cooling and warming centers conflict with social distancing requirements • Utility failures (power, water) exacerbate health risks for



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Compound Hazard Scenario	Key Impacts and Interactions
	vulnerable populations• Emergency sheltering and continuity operations face logistical strain
Pandemic + Infrastructure Failure	• Utility and service disruptions compound public health crises• Telecommunications outages disrupt telehealth, remote work, and emergency coordination• Water and wastewater system failures impede sanitation and infection control• Power outages impact healthcare delivery, communications, and essential service continuity

Lifelines

Infectious disease events, particularly pandemics, impact all seven FEMA community lifelines:

Table 123. Lifelines

Community Lifeline	Primary Impacts
Safety and Security	• Direct illness and loss of life from infectious diseases• Healthcare system overwhelm affects life safety operations• Potential for civil unrest or unrest fatigue during prolonged restrictions• First responder illness reducing operational capacity• Increased mental and behavioral health crises during isolation or stress events
Food, Water, Shelter	• Supply chain disruptions affect food availability and cost• Economic downturns reduce household ability to afford food or rent• Water and wastewater systems must maintain operations despite staff illness• Housing instability increases during economic disruption• Congregate shelters difficult to manage due to infection risk and distancing requirements
Health and Medical	• Healthcare system capacity overwhelmed by surge in infectious disease cases• Illness among healthcare workers reduces response effectiveness• Medical supply and PPE shortages impede treatment• Routine and elective care delayed or suspended• Increased demand for mental health and substance abuse services
Energy	• Utility workforce illness may disrupt operations and maintenance• Fuel and supply chain disruptions affect power generation and delivery• Economic slowdown initially reduces demand, followed by surges from remote work and healthcare loads• Reliable power critical for healthcare, communications, and remote operations
Communications	• Telecommunications demand spikes due to remote work, telehealth, and online education• Need for rapid and accurate public health messaging• Misinformation undermines response effectiveness•



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Community Lifeline	Primary Impacts
	Workforce illness and supply chain issues impact communications infrastructure
Transportation	• Reduced air, rail, and transit operations due to workforce illness and travel restrictions• Supply chain and freight delays impacting essential goods and medical supplies• Public transit service interruptions due to exposure risk or limited staffing• Challenges ensuring emergency medical and supply transport continuity
Hazardous Materials	• Limited direct impact from infectious disease• Significant increase in medical and biohazard waste generation during pandemics• Need for safe disposal and handling of contaminated materials from healthcare and testing operations

Infectious disease events are interconnected with multiple other hazards in the planning area:

- Infectious Disease and Healthcare Capacity: Pandemics directly strain limited healthcare capacity, potentially causing healthcare system collapse that affects all other hazards (trauma care, cardiac emergencies, etc. may be unavailable).
- Infectious Disease and Economic Stability: Severe pandemics create economic crises that compound other hazards by reducing household and government resources for preparedness and response.
- Infectious Disease and Social Cohesion: Pandemics can create community division over public health measures, reducing social cohesion that is critical for mutual aid during other emergencies.
- Infectious Disease and Mental Health: Pandemics create mental health crises that persist long after disease transmission is controlled.
- Infectious Disease and Other Hazards: As noted in Compounded Risk section, pandemics occurring simultaneously with other hazards create challenges exceeding the sum of individual hazards.

Recent and Future Development

Recent development patterns and demographic trends affect infectious disease vulnerability.

- Population Growth: Park County has experienced modest population growth, increasing the total number of people potentially affected by outbreaks. Growth of approximately 8-10% over past five years increases exposure.
- Aging Population: Park County's population continues to age, increasing the proportion of high-vulnerability individuals. This trend is expected to continue as Baby Boomers age and retirees move to the area.
- Second Home Development: Growth in vacation homes creates challenges:
 - Seasonal residents may introduce diseases from other areas
 - May not establish local healthcare relationships



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- Population fluctuations complicate disease surveillance
- May strain resources during high-occupancy periods
- Healthcare Infrastructure: Limited improvement in healthcare infrastructure despite population growth:
 - No hospital remains in development or planning stages
 - Primary care capacity has not significantly expanded
 - Ongoing challenges recruiting and retaining healthcare providers
- Telehealth adoption represents positive development but doesn't replace all in-person care
- Tourism Growth: Park County's tourism sector continues to grow, increasing potential for disease introduction and complicating outbreak control. Tourism is economically vital but creates public health challenges.
- Technology Infrastructure: Broadband expansion is slowly improving access to telehealth and remote work/learning, enhancing pandemic resilience in some areas. However, gaps remain in rural locations.

Future Development Implications:

Continued population growth without proportional healthcare infrastructure expansion will increase vulnerability to infectious disease outbreaks. An aging population will increase the proportion of high-vulnerability individuals requiring healthcare during outbreaks. Since the previous HMP update, the planning area's vulnerability to pandemic and infectious disease has changed significantly:

- Increased Awareness and Preparedness: COVID-19 dramatically increased awareness of pandemic risk and highlighted preparedness gaps. Emergency planning now includes pandemic considerations more thoroughly.
- Healthcare System Stress: The pandemic revealed healthcare system vulnerabilities and created ongoing staffing challenges. Healthcare worker burnout and shortages may persist for years, reducing capacity for future outbreaks.
- Enhanced Response Capabilities: Experience with COVID-19 enhanced some response capabilities:
 - Improved coordination mechanisms between local, state, and federal agencies
 - Enhanced testing and laboratory capabilities (though primarily state/federal assets)
 - Vaccination infrastructure and mobile vaccination capability
 - Telehealth infrastructure and acceptance
 - Public understanding of disease control measures (though also controversy)
- Social Divisions: COVID-19 created social divisions regarding public health measures. These divisions may complicate future outbreak response and reduce community cohesion.



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- **Economic Impacts:** Pandemic economic impacts created hardships that may reduce household resilience to future events. However, federal assistance programs demonstrated that support is available during major events.
- **Psychological Impacts:** "Pandemic fatigue" and mental health impacts from COVID-19 may affect public willingness to comply with future disease control measures.
- **Infrastructure Improvements:** Some infrastructure improvements occurred:
 - Enhanced telecommunications in some areas
 - Remote work and distance learning capabilities demonstrated and refined
 - Supply chain awareness and some diversification
- **Ongoing COVID-19:** Endemic circulation of COVID-19 creates ongoing disease burden and keeps some preparedness measures active (vaccination campaigns, surveillance)

Overall Assessment: the planning area's vulnerability to pandemic and infectious disease has changed in complex ways. Some aspects of vulnerability have decreased (awareness, preparedness, capabilities), while others have increased (healthcare workforce challenges, social divisions, pandemic fatigue). The county is better prepared for some aspects of future pandemics but faces new challenges emerging from COVID-19 experience. The most critical vulnerability remains limited local healthcare infrastructure and lack of local public health department. This limitation severely constrains the county's ability to respond independently to infectious disease outbreaks and creates dependence on state and regional resources.

Consequence Analysis

Table 124. Pandemic and Infectious Disease Consequence Analysis

Consideration	Description
Public	Infectious diseases threaten life safety through illness and death, disproportionately impacting vulnerable populations. Pandemics cause widespread social disruption, fear, and long-term psychological stress. Quality of life declines during major outbreaks due to isolation, economic hardship, and disruption of normal activities. COVID-19 resulted in approximately 40–50 deaths and thousands of illnesses in Park County.
Responders	Healthcare workers and first responders face elevated exposure risks and prolonged operational strain. Extended outbreak duration leads to stress, burnout, and potential workforce shortages. The healthcare system may become quickly overwhelmed by surge demands, and illness among responders can reduce overall emergency response capacity across all hazards.
Continuity of Operations (Government)	Pandemics disrupt government operations through staff illness, facility closures, and resource shortages. The Emergency Operations Center (EOC) may require long-term activation lasting months or years. Sustained



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Consideration	Description
	coordination with state and federal agencies is necessary, while reduced revenues and increased emergency costs strain local budgets.
Public Confidence in Government	Transparent communication and effective disease control efforts build public confidence. In contrast, inconsistent messaging, perceived inadequate response, or unpopular health measures erode trust. The COVID-19 pandemic revealed community divisions over public health authority and highlighted tensions between individual rights and collective safety.
Property	Direct property damage from infectious disease is minimal, though economic impacts are significant. Business closures, reduced property values, and facility retrofits for infection control are common secondary effects. Medical and essential facilities often require operational or structural adjustments.
Facilities & Infrastructure	Healthcare facilities face capacity challenges during outbreaks. Schools, government buildings, and essential services must adopt infection control protocols. Economic impacts are severe for non-essential businesses, while utilities and communication providers must maintain continuity under workforce constraints.
Environment	Infectious diseases have limited direct environmental effects. However, behavioral and economic changes during pandemics—such as reduced travel and industrial activity—can temporarily improve air quality and reduce emissions.
Economic	Pandemics generate widespread and long-lasting economic disruption. COVID-19 caused an estimated \$21–\$41 million in total impacts to Park County over a three-year period, including business closures, unemployment, tourism decline, revenue losses, and healthcare costs. Economic recovery is slow, with persistent effects across multiple sectors.

Multi-Jurisdictional Concerns

Pandemic and infectious disease hazards are inherently multi-jurisdictional concerns requiring coordinated response across the entire planning area and beyond county boundaries. All jurisdictions share concerns about:

- Infectious disease transmission not respecting jurisdictional boundaries
- Limited healthcare infrastructure affecting entire county
- Need for coordinated public health messaging and disease control measures
- Shared dependence on state and federal resources
- Economic impacts affecting all communities
- Vulnerable population support needs across jurisdictions



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Regional Coordination Needs: Infectious disease response requires coordination beyond Park County:

- Hospital services in neighboring counties (Jefferson, Teller, Chaffee, Summit)
- Public health services through CDPHE regional office
- Emergency medical services transport agreements
- Mutual aid for emergency response if responders ill
- Regional supply chains for medical supplies, food, essential goods
- State and federal assistance and guidance

State and Federal Roles: Park County's limited local public health capacity means heavy reliance on:

- CDPHE for disease surveillance, investigation, and guidance
- CDC for national coordination, guidance, and resources
- FEMA for emergency assistance during major events
- HHS for healthcare resources and funding
- Other federal agencies for specific support (USDA for food security, etc.)

Table 125. Multi-Jurisdictional Pandemic and Infectious Disease Assessment

Jurisdiction / Partner	Shared Pandemic Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide disease transmission; limited healthcare; vulnerable populations	Large rural area with limited healthcare access; aging population; tourism-related disease introduction	Enhanced healthcare capacity; public health infrastructure development; emergency preparedness; support for vulnerable populations
Town of Fairplay	Community transmission; vulnerable elderly residents; business impacts	Downtown area as a social gathering hub; aging population; tourism-dependent economy; limited local healthcare services	Disease surveillance; public health communication; business continuity planning; vulnerable population support
Town of Alma	Small population with high vulnerability; isolation during disease control	Highest elevation town; small, aging historic population; no local healthcare access; potential isolation during response operations	Emergency preparedness; coordination for medical evacuation; support for vulnerable populations; regional health coordination
Platte Canyon FPD	Community transmission in largest population center; school	Bailey area has highest population concentration; schools as potential transmission centers;	Public health coordination; school preparedness; EMS surge capacity;



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Jurisdiction / Partner	Shared Pandemic Concerns	Notable Vulnerabilities	2025 HMP Priorities
	impacts; healthcare access	distance to hospitals; EMS transport surge	healthcare transport capability
Lake George FPD	Rural transmission; healthcare access challenges; vulnerable populations	Rural area with limited healthcare infrastructure; aging and seasonal populations complicating surveillance	Public health communication; healthcare access; vulnerable population identification; regional coordination
North-West FPD	Rural disease transmission; limited healthcare and response resources	Extremely rural service area; minimal healthcare facilities; small emergency workforce vulnerable to illness	Responder protection; mutual aid agreements; public health communication; interagency coordination
South Park Ambulance District	Countywide EMS during pandemic; responder exposure; transport surge	Ambulance personnel face elevated exposure risk; limited capacity; long transport times; potential for surge conditions	Responder PPE and safety protocols; mutual aid coordination; hospital transfer planning; surge capacity management
Hartsel FPD	Rural isolation; minimal healthcare; vulnerable population	Most remote area in the county; small but high-risk population; limited infrastructure and response capacity	Emergency preparedness; responder safety; regional coordination; public health communication
Jefferson FPD	Community transmission; healthcare access; vulnerable populations	Rural community; limited healthcare access; aging population; distance to hospital care	Public health coordination; vulnerable population outreach; emergency preparedness; regional coordination
Southern Park County FPD	Rural transmission; healthcare challenges; limited resources	Very rural service area; minimal healthcare capacity; limited resources; elderly residents	Public health communication; emergency preparedness; mutual aid; regional coordination
Colorado Department of Public Health and	Primary public health authority; disease surveillance and control	Park County lacks a local health department; relies on state-level regional office for all public health functions	Disease surveillance; outbreak investigation; issuance of public health orders and guidance;



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Jurisdiction / Partner	Shared Pandemic Concerns	Notable Vulnerabilities	2025 HMP Priorities
Environment (CDPHE)			vaccination and resource distribution
Regional Hospitals	Hospital care for Park County residents during pandemics	Park County residents are a small patient share but contribute to regional surge demand	Capacity and surge planning; patient transfer agreements; communication with Park County emergency management; resource allocation coordination

Hazard Summary

Table 126. Pandemic and Infectious Disease Hazard Summary

Jurisdiction / Sector	Population Exposed	Critical Facilities Exposed	Estimated Economic Impact (Major Pandemic)	Risk Category	Key Vulnerabilities / Notes
Park County (Total)	17,718 (100%)	All critical facilities	\$25M–\$50M	High	Entire population exposed; limited healthcare infrastructure; no hospital in county; aging population; rural access and transport challenges.
High-Vulnerability Population	4,000–5,000 elderly; 3,000–4,000 individuals with chronic conditions	Healthcare and long-term care facilities	Disproportionate illness and mortality	Very High	Elderly and chronically ill populations face elevated risk of hospitalization and death; limited access to advanced medical care.
Healthcare and Emergency Services	~150–200 personnel	Medical clinics, ambulance stations, fire stations	Operational disruptions and workforce illness	Very High	Small healthcare and emergency workforce; illness or quarantine of staff severely impacts response



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Jurisdiction / Sector	Population Exposed	Critical Facilities Exposed	Estimated Economic Impact (Major Pandemic)	Risk Category	Key Vulnerabilities / Notes
					capability and healthcare access.
Essential Businesses	~500–800 workers	Grocery stores, pharmacies, utilities, government facilities	Economic losses; worker exposure	High	Essential workers must remain operational; exposure risk high; continuity planning critical for utilities and supply chains.
Tourism Sector	Variable seasonal workforce	Hotels, restaurants, recreation and lodging businesses	Severe local economic losses	High	Tourism-dependent economy vulnerable to travel restrictions, business closures, and visitor hesitancy; recovery may be prolonged.
Education Sector	~2,000 students; ~200 staff	5 schools, libraries	Educational and social disruption	High	Schools act as transmission points; closures impact childcare and workforce participation; mental health and learning gaps observed.
General Population	~12,000–13,000 lower-vulnerability residents	All residential areas and local businesses	Widespread illness and economic hardship	Moderate to High	General population experiences widespread illness, workforce absenteeism, and prolonged social and economic disruption even with lower individual health risk.



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Table 127. Quantitative Pandemic and Infectious Disease Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020 (Pre-COVID)
Total Population Exposed	17,718 (100%)	+8% — population growth increases total exposure
High-Vulnerability Population (elderly, chronic conditions)	7,000–9,000 (40–50%)	+15% — aging population and chronic health prevalence rising
Healthcare Workers	150–200	Stable to declining — burnout and recruitment challenges persist
Hospital Beds in County	0	No change — no hospital in Park County
Primary Care Providers	8–12 providers	Stable to slightly declining — limited access to care
Emergency Medical Transport Capacity	6–8 ambulances countywide	Stable — limited surge capacity during outbreaks
Annual Routine Infectious Disease Costs	\$1.0M–\$2.0M	Stable — driven by seasonal flu and endemic diseases
Major Outbreak Frequency (non-pandemic)	Every 3–5 years	Stable — typical cyclic severe flu or localized outbreaks
Pandemic Probability	1–5% annually	Increased awareness but underlying probability unchanged
Pandemic Potential Economic Impact	\$25M–\$50M	Increased — higher population, property, and tourism dependency
COVID-19 Total Cases (confirmed)	4,000+	N/A — new disease (2020 onset)
COVID-19 Total Deaths	40–50	N/A — first pandemic in recent decades
Public Health Department	0 (state-managed through CDPHE regional office)	No change — county remains without local public health department
Telehealth Capability	Significantly improved	Major improvement — expanded access post-COVID-19
Public Awareness of Pandemic Risk	Very high	Dramatically increased following COVID-19 experience
Healthcare System Preparedness	Improved but limited	Enhanced planning and PPE stockpiles; still constrained by capacity



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Exposure Metric	2025 Estimate	Change Since 2020 (Pre-COVID)
Social Cohesion Regarding Public Health	Challenged	Decreased due to COVID-19-related controversies and polarization



Hazard: Earthquake

Background

The planning area faces low to moderate seismic hazard compared to more active seismic zones in the western United States, but the potential for damaging earthquakes exists. Colorado experiences hundreds of small earthquakes annually, most too small to be felt by humans, and occasional moderate earthquakes that can cause structural damage and disrupt infrastructure. While major destructive earthquakes are rare in Colorado, the state's seismic history includes several significant events, and the potential for future damaging earthquakes cannot be dismissed.

Seismic activity in Colorado is associated with several factors: ancient fault systems that remain capable of movement, induced seismicity from human activities (primarily oil and gas operations in other parts of the state, though limited in Park County), natural tectonic stresses in the Rocky Mountain region, and potential volcanic-related seismicity (though Colorado has no active volcanoes). The complex geology of the Rocky Mountains, including numerous faults and fractures, creates conditions where earthquakes can occur, though the frequency and magnitude are generally lower than in states along active plate boundaries like California.

The planning area's seismic risk is influenced by several geological and infrastructure factors. The county contains mapped faults and lineaments that represent potential earthquake sources, though most are considered to have low activity rates. The region's crystalline bedrock and varied surficial geology create different ground motion amplification patterns, with some soil types and valley fill materials potentially amplifying earthquake shaking. Additionally, the county's aging infrastructure, including unreinforced masonry buildings in historic downtown districts (Fairplay, Alma), bridges, dams, and utilities, may be vulnerable to earthquake damage despite the relatively low seismic hazard.

Earthquake impacts in the planning area could include: ground shaking causing structural damage to buildings, bridges, and infrastructure; landslides and rockfalls triggered by seismic shaking, particularly in steep mountain terrain; damage to critical infrastructure including water systems, electrical distribution, telecommunications, and transportation corridors; dam failure or damage at the few small dams in the county; casualties from structural collapse or triggered landslides; economic disruption from infrastructure damage and business interruption; and cascading impacts as damaged infrastructure affects emergency response and recovery.

The county's rural character and limited emergency response resources create additional challenges. Search and rescue operations following a damaging earthquake would be complicated by steep terrain, limited access, and small emergency response workforce. Mutual aid from neighboring counties might be unavailable if a regional earthquake affects multiple counties simultaneously. The lack of a hospital in Park County means that earthquake casualties would require transport to neighboring counties, potentially along damaged transportation corridors.



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While the probability of a major damaging earthquake in the planning area is low compared to high-hazard seismic zones, the potential consequences and the county's infrastructure vulnerabilities warrant attention to earthquake preparedness, building code enforcement for new construction, and seismic retrofitting of critical facilities and vulnerable structures.

Earthquake hazard was evaluated in the planning area's 2025 Hazard Ranking Worksheet. While ranked lower than more frequent hazards such as wildfire, winter storms, and high winds, earthquakes represent a low-probability, high-consequence hazard that requires consideration in comprehensive emergency planning.

Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan, the United States Geological Survey (USGS), and seismological standards for the purposes of consistency and alignment with state and federal seismic hazard assessment efforts.

Earthquake: A sudden release of energy in the Earth's crust that creates seismic waves, resulting in ground shaking. Earthquakes occur when stress accumulated along faults or in rock exceeds the strength of the rock, causing sudden movement or rupture.

Magnitude: A measure of the energy released by an earthquake, typically expressed using the Moment Magnitude Scale (Mw) or the older Richter Scale. Magnitude is a logarithmic scale, meaning each whole number increase represents approximately 32 times more energy release. For example:

- Magnitude 2.0-3.0: Generally not felt; detected by instruments
- Magnitude 3.0-4.0: Often felt; rarely causes damage
- Magnitude 4.0-5.0: Widely felt; may cause minor damage to poorly constructed buildings
- Magnitude 5.0-6.0: Can cause damage to structures, particularly older or poorly constructed buildings
- Magnitude 6.0-7.0: Can cause significant damage over considerable areas
- Magnitude 7.0+: Major earthquake; can cause serious damage over large areas

Intensity: A measure of earthquake effects at a specific location, describing the severity of ground shaking and damage. The Modified Mercalli Intensity (MMI) scale ranges from I (not felt) to XII (total destruction). Intensity depends on distance from the earthquake epicenter, local geology, and building construction.

Epicenter: The point on the Earth's surface directly above the focus (hypocenter) where an earthquake originates. The epicenter is typically where ground shaking is strongest, though local geology and topography can affect shaking patterns.

Focus (Hypocenter): The actual location within the Earth where an earthquake rupture begins. Earthquakes in Colorado typically have focal depths of 1-15 kilometers (0.6-9 miles), considered shallow to moderate depth.



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Fault: A fracture or zone of fractures in rock along which there has been displacement of the two sides relative to one another. Active faults are those that have moved in recent geological time (typically the past 10,000 years) and are considered capable of producing earthquakes.

Liquefaction: A process by which water-saturated sediment temporarily loses strength and behaves as a liquid during earthquake shaking. Liquefaction can cause severe damage to buildings and infrastructure. While less common at Park County's elevations due to generally well-drained conditions, localized areas with high water tables or saturated sediments could be vulnerable.

Surface Rupture: Visible displacement at the ground surface along a fault during an earthquake. Surface rupture is typically associated with larger magnitude earthquakes (generally magnitude 6.0 or greater).

Aftershock: A smaller earthquake that occurs after a main earthquake in the same general area. Aftershocks can continue for days, weeks, months, or even years after the main event and can cause additional damage to already weakened structures.

Peak Ground Acceleration (PGA): A measure of the maximum ground acceleration during an earthquake, expressed as a percentage of gravity (g). PGA is used in engineering to assess potential structural damage. For context:

- PGA <10% g: Minor to no damage to well-built structures
- PGA 10-20% g: Potential for moderate damage to vulnerable structures
- PGA 20-40% g: Potential for significant damage to structures
- PGA >40% g: Potential for severe damage even to well-built structures

Seismic Hazard: The probability that a given level of earthquake shaking will occur at a specific location within a given time period, typically expressed for a 50-year period (building design lifetime) or a 2,500-year period (critical facility design).

Induced Seismicity: Earthquakes caused or triggered by human activities, such as fluid injection associated with oil and gas operations, reservoir impoundment, mining, or geothermal operations. Induced seismicity is generally low magnitude but can occasionally produce damaging earthquakes.

Location and Extent

Earthquake hazards affect the entire planning area, though seismic hazard levels and potential impacts vary based on proximity to known faults, local geology, and building construction. The United States Geological Survey (USGS) and the Colorado Geological Survey (CGS) provide seismic hazard assessments and fault mapping for Colorado, including Park County.

According to the USGS National Seismic Hazard Model, Park County is located in a zone of low to moderate seismic hazard within the context of the conterminous United States. Peak Ground Acceleration (PGA) values for Park County, representing ground shaking with a 2% probability of exceedance in 50 years (approximately a 2,500-year return period), range from approximately 8-15% g depending on location within the county.



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To put this in context:

- California's San Francisco Bay Area: PGA values of 60-100% g or higher
- Colorado's Front Range: PGA values of 8-20% g
- Park County: PGA values of 8-15% g (low to moderate hazard)
- Central and Eastern United States stable areas: PGA values of 2-8% g

While Park County's seismic hazard is significantly lower than California or other high-hazard regions, the potential for damaging earthquakes exists. An earthquake with magnitude 5.5-6.0 occurring near or within the county could cause significant damage to vulnerable structures and infrastructure.

Park County contains several mapped faults and lineaments, though most are considered to have low to very low activity rates:

Mosquito Fault Zone: The most prominent fault system in Park County, located along the eastern flank of the Mosquito Range. This north-south trending fault zone passes near Fairplay and Alma. Geological evidence indicates past movement, though no historical earthquakes have been definitively attributed to this fault. The fault is considered potentially active but with a very low slip rate (movement per year).

South Park Fault: A fault system mapped in the South Park basin. Like the Mosquito Fault, this is considered to have low activity but represents a potential seismic source.

Williams Range Thrust Fault: Located in the northern portion of Park County, this fault system shows evidence of ancient movement. Current activity rate is considered very low.

Unnamed Faults and Lineaments: Numerous smaller faults and linear features exist throughout Park County, identified through geologic mapping and remote sensing. Most are considered inactive or have very low activity rates, but they represent the complex structural geology of the Rocky Mountains.

Regional Seismic Sources: Park County could also experience ground shaking from earthquakes occurring in neighboring areas:

- Front Range faults (northeast of Park County)
- Sawatch Range faults (west of Park County)
- Rio Grande Rift faults (south of Park County)
- Unidentified or unmapped faults throughout central Colorado

A large earthquake (magnitude 6.0+) occurring within 50-100 kilometers of Park County could produce moderate to strong shaking in the county, even if the epicenter is outside county boundaries.



Park County Seismic Hazard and Known Faults

[Map showing USGS seismic hazard levels, known faults, and communities in Park County]

Local geology influences how earthquake ground motions are amplified or reduced:

- **Bedrock Areas:** Much of Park County consists of crystalline bedrock (granite, gneiss, schist) at or near the surface, particularly in mountainous areas. Bedrock generally experiences less amplification of earthquake shaking compared to soft soils.
- **Valley Fill and Alluvium:** South Park basin contains valley fill sediments (sand, gravel, clay) that may amplify earthquake shaking compared to bedrock. Thicker sediment deposits can experience stronger and longer-duration shaking.
- **Colluvium and Slope Deposits:** Hillslopes mantled with loose colluvium may be susceptible to landsliding during earthquake shaking. Steep terrain throughout Park County contains these deposits.
- **Glacial Deposits:** Some areas contain glacial till and outwash deposits. These materials have varying characteristics affecting seismic response.

The Colorado Geological Survey has not completed detailed geologic hazard mapping specifically addressing seismic amplification for most of Park County. General understanding of geology suggests that South Park basin valley fill areas may experience somewhat greater shaking than surrounding bedrock highlands during an earthquake.

Liquefaction Potential: Liquefaction (soil temporarily behaving as a liquid during earthquake shaking) is generally considered low risk in Park County due to:

- High elevation and well-drained conditions
- Generally low water tables except near streams and wetlands
- Coarse-grained sediments (sand and gravel) in many areas drain well
- Cold climate with seasonal frozen ground

However, localized areas with saturated fine-grained sediments near streams, ponds, or wetlands could potentially experience liquefaction effects during strong shaking.

Landslide and Rockfall Potential: Earthquake-induced landslides and rockfalls represent a significant concern in Park County's steep mountain terrain. Seismic shaking can trigger:

- Rockfalls from cliffs and steep slopes
- Debris slides on steep, vegetated slopes
- Reactivation of existing landslide deposits
- Rock avalanches in alpine terrain

Highway corridors through steep terrain (Highway 285 through Turkey Creek Canyon and over Kenosha Pass, Highway 9 over Hoosier Pass) are particularly vulnerable to earthquake-induced landslides and rockfalls.



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Beyond direct ground shaking, earthquakes can produce secondary effects in Park County:

Dam Failure or Damage: Park County contains several small dams and reservoirs. Earthquake shaking could potentially damage dam structures, though most dams are small and would have limited downstream consequences. However, dam failure remains a concern requiring assessment.

Utility Infrastructure Damage:

- Water and wastewater systems vulnerable to pipe breaks
- Electrical distribution systems vulnerable to damage from ground shaking and falling structures
- Natural gas systems (limited in Park County) vulnerable to pipeline rupture
- Telecommunications infrastructure vulnerable to tower and equipment damage

Bridge Damage: Bridges throughout Park County vary in age and seismic design standards. Older bridges may be vulnerable to damage from moderate earthquakes. Highway 285 and Highway 9 bridges are critical transportation links.

Fire Following Earthquake: Damaged gas lines, electrical systems, or wood stoves could ignite fires following an earthquake. Fire suppression capabilities may be impaired by damaged water systems and infrastructure, and fire department response may be limited if responders are dealing with earthquake damage and casualties.

Hazardous Materials Release: While Park County has limited industrial hazardous materials, propane storage facilities, fuel storage tanks, and other materials could be damaged in an earthquake, creating release risks.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, earthquake hazards in Colorado are characterized by:

- Low to moderate seismic hazard compared to high-hazard states
- Hundreds of small earthquakes annually (magnitude <3.0)
- Occasional moderate earthquakes (magnitude 4.0-5.5)
- Rare but possible larger earthquakes (magnitude 5.5+)
- Potential for induced seismicity, primarily in oil and gas production areas (limited relevance to Park County)

The State HMP notes that despite relatively low hazard, Colorado's earthquake risk should not be ignored due to:

- Vulnerable infrastructure (aging buildings, bridges, dams)
- Unreinforced masonry buildings in historic districts
- Potential for regional earthquakes affecting multiple counties
- Secondary hazards (landslides, dam failure) that could amplify impacts

Park County's seismic hazard is generally consistent with other Colorado mountain counties. The most significant historical earthquakes in Colorado occurred in areas west and north of Park County, though seismic waves from those events were felt in the Park County area.



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Statewide Seismic Hazard Context

[State-level map showing Colorado seismic hazard zones and historical earthquakes]

Previous Occurrences

Earthquake documentation for Park County and the surrounding region is derived from the United States Geological Survey earthquake catalog, Colorado Geological Survey records, historical accounts, and seismological studies. Colorado has experienced numerous earthquakes, though most are small magnitude and cause no damage.

Table 128. Notable Historical Earthquakes Affecting or Near Park County

Date	Location	Magnitude	Epicenter Distance from Park County	Impacts on Park County
November 7, 1882	Northern Colorado (multiple events)	~6.5 (largest)	~150–200 km	Felt throughout the region; minor damage possible but not well documented for Park County.
November 8, 1882	Northern Colorado aftershock	~6.0+	~150–200 km	Strong aftershock; widely felt across Colorado.
August 9, 1967	Northglenn (Denver area)	5.3	~80 km	Felt in Park County; no reported damage.
November 26, 1967	Northeast Colorado	5.2	~150+ km	Felt in Park County; no reported damage.
Various (1960s–1980s)	Rangely area	Up to 5.5	~250+ km	Some events felt in Park County; associated with reservoir-induced seismicity; no damage reported.
August 22, 2011	Greeley area	3.5	~120 km	Felt in Park County; no reported damage.
August 23, 2011	Virginia (East Coast)	5.8	~2,500 km	Felt by some in Colorado, possibly including Park County; no damage—demonstrates long-distance wave propagation.
October 9, 2013	Paradox Valley	4.3	~300+ km	Generally not felt in Park County.
May 31, 2014	Paradox Valley	4.0	~300+ km	Generally not felt in Park County.
August 22, 2018	Lyons area	3.2	~110 km	Felt in Park County; no reported damage.



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Date	Location	Magnitude	Epicenter Distance from Park County	Impacts on Park County
Various (2010s–2020s)	Multiple small events statewide	<4.0	Varies	Most not felt in Park County; no documented impacts.

Documented earthquakes with epicenters within or very near Park County boundaries have been small magnitude and generally not felt or causing no damage:

- Numerous microearthquakes (magnitude <2.0): Detected by seismic networks but not felt by residents
- Occasional small felt earthquakes (magnitude 2.0-3.5): A few events per decade; generally felt by few people; no damage
- No documented moderate or large earthquakes (magnitude 4.0+) with epicenters in Park County in historical record (approximately 150 years)

Table 129. Selected Small Earthquakes in or Near Park County (2000-Present)

Date	Magnitude	Epicenter Location	Depth	Reports / Impacts
March 15, 2003	2.8	Near Fairplay	~8 km	Felt by some residents; no damage reported.
August 7, 2008	2.4	South Park Basin	~5 km	Lightly felt locally; no damage.
June 22, 2012	3.1	Near Lake George	~9 km	Widely felt; no damage reported; prompted community concern.
September 9, 2015	2.6	Near Bailey	~7 km	Felt by some residents; no reported damage.
April 18, 2019	2.9	Near Hartsel	~6 km	Light shaking felt locally; no damage.
November 3, 2021	2.3	South Park area	~8 km	Detected instrumentally; few felt reports.
July 14, 2023	2.7	Near Fairplay	~7 km	Felt by many residents; no damage; widely discussed on social media.

These small earthquakes are typical of low-level background seismicity. They demonstrate that the region is seismically active, even if only at low levels. The occurrence of magnitude 2-3 earthquakes indicates that stress continues to accumulate and be released in the Earth's crust, though at rates much lower than in highly active seismic zones.



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While no major damaging earthquakes have occurred in Park County proper, several significant earthquakes in Colorado history provide context:

- 1882 Northern Colorado Earthquake Sequence: The largest known historical earthquakes in Colorado, with estimated magnitudes up to 6.5. These earthquakes occurred near the Colorado-Wyoming border and caused damage in northern Colorado. They were felt throughout Colorado including Park County area, though specific impacts in Park County are not well documented given the sparse population and limited contemporary reporting.
- 1967 Northglenn Earthquake (Magnitude 5.3): Occurred in the Denver area and was felt widely across the Front Range and mountains. Minor damage occurred in the Denver area. This earthquake demonstrated that moderate earthquakes can occur in the Front Range region.

Various Induced Seismicity Events: Colorado has experienced induced seismicity related to reservoir impoundment (Rangely) and fluid injection. These events have generally occurred in western Colorado far from Park County. However, they demonstrate that human activities can trigger earthquakes, though the potential for induced seismicity in Park County is very low given limited industrial activity.

Paleo seismology, the study of prehistoric earthquakes through geologic evidence has been conducted on some Colorado faults but not comprehensively in Park County. Some faults in the region show evidence of movement in the past tens of thousands of years, but recurrence intervals (time between earthquakes) appear to be very long, often thousands to tens of thousands of years.

The lack of major historical earthquakes in Park County does not mean that large earthquakes cannot occur. The ~150-year historical record is very short in geologic terms. Faults capable of producing magnitude 6.0+ earthquakes may have recurrence intervals of thousands of years, meaning they could occur at any time but the probability in any given year or decade is very low.

Based on USGS seismic hazard assessments:

- Probability of experiencing ground shaking of Modified Mercalli Intensity VI (strong shaking, potential for damage to vulnerable structures) or greater in Park County: Approximately 5-10% in 50 years
- Probability of experiencing ground shaking of MMI VII (very strong shaking, potential for damage to ordinary structures) or greater: Approximately 1-3% in 50 years
- Probability of a magnitude 5.0+ earthquake with epicenter in or immediately adjacent to Park County: <1% in 50 years

These probabilities reflect the relatively low but not negligible seismic hazard in the region.

Disaster Declarations

Park County has not received federal disaster declarations specifically for earthquake events, reflecting the lack of damaging earthquakes in the county's historical record.



Probability of Future Occurrence

Earthquake probability assessment is complex and involves significant uncertainty. Based on USGS seismic hazard models, geological understanding, and historical seismicity:

Table 130. Annual Probability Assessments

Scenario	Estimated Magnitude Range	Annual Probability	Expected Impacts
Microearthquakes	< 2.0	~100%	Numerous minor events occur annually statewide; typically, not detected without instruments; no impacts.
Small Felt Earthquakes	2.0 – 3.5	30–50%	Light shaking may be felt by some residents; no damage expected; may generate public concern or social media activity.
Moderate Earthquake Affecting Park County	4.0 – 5.0	2–5%	Minor damage possible to older or unreinforced structures; widely felt across the county; potential for localized rockfalls or small landslides.
Damaging Earthquake	5.0 – 6.0	<1%	Moderate to significant structural damage possible; infrastructure impacts likely (roads, bridges, water systems); emergency response and mutual aid required.
Major Earthquake	6.0+	<0.2%	Catastrophic consequences; widespread structural failure; major infrastructure disruption; multiple casualties; long-term recovery required.

These probabilities indicate that while damaging earthquakes are unlikely in any given year, over the lifetime of buildings and infrastructure, the cumulative probability becomes more significant.



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Table 131. Return Period Estimates

Event Type	Estimated Magnitude Range	Approximate Return Period	Notes
Moderate to Damaging Earthquake	5.0+	100–300 years	Low-frequency but regionally possible event; may cause structural and infrastructure damage, particularly to unreinforced masonry and older facilities.
Major Earthquake	6.0+	500–2,000+ years	Very low-probability, high-consequence event; capable of widespread damage across multiple counties; extended recovery period likely.

Return periods are averages and do not mean earthquakes occur on regular schedules. A magnitude 6.0 earthquake could occur tomorrow (very low probability) or not for thousands of years. Return periods help conceptualize long-term risk.

Stable Probability: Unlike some hazards where climate change may affect frequency (flooding, wildfire), earthquake probability is generally stable over human timescales. The geologic processes causing earthquakes operate over thousands to millions of years.

Potentially Increasing Risk (not probability): While earthquake probability is stable, earthquake risk (probability × consequences) may increase due to:

- Development growth increasing exposed population and property
- Aging infrastructure becoming more vulnerable
- Increased reliance on critical infrastructure (communications, utilities)

Uncertainty: Significant scientific uncertainty exists in earthquake probability estimates, particularly for low-seismicity regions like Colorado. Actual earthquake occurrence may be higher or lower than model predictions.

Future Costs

Estimating earthquake costs for Park County is challenging given the low probability of occurrence and high variability in potential impacts. Costs would depend heavily on earthquake magnitude, epicenter location, depth, and secondary effects.

In years without earthquakes (the vast majority of years):



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Table 132. No Earthquake Scenario (Base Case)

Category	Estimated Annual Cost	Description / Notes
Earthquake Preparedness and Planning	\$5,000 – \$15,000	Includes staff time, plan updates, hazard analysis, and integration with emergency management and mitigation programs.
Seismic Monitoring and Research (State/Federal Share)	\$2,000 – \$5,000	Portion of state and federal monitoring programs attributed to Park County region for seismic detection and analysis.
Building Code Enforcement	Minimal incremental cost	Ensures compliance with seismic design standards for new construction and retrofits; part of existing permitting process.
Public Education and Outreach	\$1,000 – \$3,000	Annual public awareness campaigns on earthquake safety, home preparedness, and structural mitigation.
Total Annual Base Cost	\$8,000 – \$23,000	Reflects ongoing local and regional investment in earthquake risk reduction and preparedness.

These costs represent routine preparedness and are minor compared to potential earthquake damage costs.

A minor earthquake causing light damage to a few vulnerable structures:

Table 133. Minor Earthquake Scenario (Magnitude 4.0-4.5)

Category	Estimated Cost per Event	Description / Notes
Structural Damage	\$50,000 – \$200,000	Minor structural impacts including cracked foundations, chimney failures, and interior falling objects.
Emergency Response and Inspections	\$10,000 – \$30,000	Fire, EMS, and building inspection overtime and deployment costs.
Minor Infrastructure Repairs	\$20,000 – \$80,000	Repairs to water lines, pavement, bridges, and utility systems.
Business Interruption	\$30,000 – \$100,000	Temporary business closures, reduced operations, and lost productivity.
Public Information and Reassurance	\$5,000 – \$15,000	Risk communication, media updates, and public outreach activities.
Total Estimated Minor Earthquake Costs	\$115,000 – \$425,000 per event	Represents aggregate community-level impacts and short-term recovery needs.



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Frequency: Approximately once every 20-50 years

A moderate earthquake causing significant damage to vulnerable structures and infrastructure:

Table 134. Moderate Earthquake Scenario (Magnitude 5.0-5.5):

Category	Estimated Cost per Event	Description / Notes
Structural Damage	\$2 – \$5 million	Significant damage to older or unreinforced masonry structures, mobile homes, and non-retrofitted buildings.
Infrastructure Damage	\$1 – \$3 million	Damage to water systems, roads, bridges, utilities, and critical infrastructure networks.
Emergency Response and Sheltering	\$200,000 – \$500,000	Includes search and rescue, shelter operations, and first responder overtime.
Business Interruption and Economic Impacts	\$500,000 – \$2 million	Economic disruption due to closures, loss of tourism, and prolonged recovery.
Public Building and School Damage	\$500,000 – \$1.5 million	Structural and non-structural damage to government buildings and educational facilities.
Landslide and Rockfall Cleanup	\$300,000 – \$1 million	Slope failure and debris removal from transportation corridors and developed areas.
Engineering Assessments and Inspections	\$100,000 – \$300,000	Post-event structural evaluations and damage documentation.
Total Estimated Moderate Earthquake Costs	\$4.6 – \$13.3 million per event	Represents cumulative direct and indirect costs for a moderate regional event.

Frequency: Approximately once every 100-300 years

A major earthquake causing widespread damage across the county:

Table 135. Major Earthquake Scenario (Magnitude 6.0+)

Category	Estimated Cost per Event	Description / Notes
Structural Damage	\$15 – \$40 million	Widespread structural damage to residential, commercial, and industrial buildings. High damage potential in unreinforced masonry and older construction.
Critical Infrastructure Damage	\$10 – \$25 million	Severe damage to water, sewer, transportation, bridges, and utility systems; prolonged service outages likely.



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Category	Estimated Cost per Event	Description / Notes
Emergency Response, Search and Rescue, Medical	\$1 – \$3 million	Intensive rescue operations, emergency medical response, and mutual aid deployments.
Temporary Housing and Sheltering	\$0.5 – \$2 million	Costs for temporary housing, shelters, and support services for displaced residents.
Business Interruption and Economic Losses	\$5 – \$15 million	Widespread business disruption, long-term closures, and loss of tourism revenue.
Public Facilities Damage	\$3 – \$8 million	Significant damage to government facilities, schools, and community centers.
Dam Damage or Failure	\$2 – \$10 million	Possible failure or repair costs for dams; potential downstream flooding impacts.
Landslides and Secondary Hazards	\$2 – \$8 million	Earthquake-induced slope failures, debris flows, and rockfalls affecting roads and infrastructure.
Long-Term Economic Impacts	\$5 – \$15 million	Ongoing regional economic disruption, reduced property values, and recovery expenses over multiple years.
Total Estimated Major Earthquake Costs	\$43.5 – \$126 million per event	Represents combined direct, indirect, and long-term economic impacts of a catastrophic seismic event.

Frequency: Approximately once every 500-2,000+ years (very rare)

These cost estimates are highly uncertain and could vary dramatically based on specific circumstances. Actual costs could be lower if an earthquake occurs in an unpopulated area with minimal impacts, or higher if an earthquake triggers catastrophic secondary effects like major landslides or dam failures.

Probability-weighted expected annual costs considering all earthquake scenarios:

- Current conditions: \$50,000-\$150,000 annually

This annualized figure represents the long-term average annual cost when all earthquake scenarios are weighted by their probability of occurrence. Actual costs in any given year are likely to be zero (no earthquake) or very high (earthquake occurs).



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Table 136. Earthquake Cost Scenarios Summary

Scenario	Magnitude Range	Estimated Total Cost	Approximate Frequency	Key Impacts
No Earthquake (Base Condition)	N/A	\$8,000 – \$23,000 per year	Annual	Annual preparedness and mitigation planning, seismic monitoring, and public education activities.
Minor Earthquake	4.0 – 4.5	\$115,000 – \$425,000 per event	Every 20 – 50 years	Minor damage to older or unreinforced structures; limited infrastructure disruption; increased public awareness and emergency inspections.
Moderate Earthquake	5.0 – 5.5	\$4.6 million – \$13.3 million per event	Every 100 – 300 years	Noticeable structural and infrastructure damage; emergency response activation; localized landslides or rockfalls; potential utility outages.
Major Earthquake	6.0 +	\$43.5 million – \$126 million per event	Every 500 – 2,000 + years	Widespread destruction of buildings and infrastructure; long-term housing and economic disruption; regional disaster declaration and extended recovery operations.

Seismic mitigation measures can substantially reduce earthquake losses:

- **Seismic Retrofitting:** Retrofitting vulnerable structures (particularly unreinforced masonry) has benefit-cost ratios of 2:1 to 4:1 in moderate seismic hazard areas.
- **Building Code Enforcement:** Ensuring new construction meets modern seismic codes has minimal incremental cost but substantially improves earthquake resistance. Benefit-cost ratios of 4:1 to 6:1.
- **Critical Facility Seismic Standards:** Designing critical facilities (emergency operations center, fire stations, hospitals in neighboring counties, water systems) to higher seismic standards has benefit-cost ratios of 3:1 to 5:1.
- **Infrastructure Resilience:** Seismic design for bridges, dams, and utilities has benefit-cost ratios of 2:1 to 4:1.
- **Public Education and Preparedness:** Very low cost with benefits during earthquake and other hazard events. Benefit-cost ratio of 5:1 or higher.

Given the relatively low seismic hazard in Park County, expensive retrofitting of all buildings is not cost-effective. However, targeted mitigation including:

- Seismic evaluation and potential retrofitting of critical facilities
- Building code enforcement for new construction
- Public education on earthquake preparedness



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- Emergency planning and exercises
- Identification and awareness of most vulnerable structures

These targeted measures provide cost-effective risk reduction.

Risk and Vulnerability

Earthquake risk in the planning area is characterized by low to moderate probability but potentially significant consequences, particularly for vulnerable structures and infrastructure. As previously discussed, USGS seismic hazard mapping indicates Park County has peak ground acceleration values of approximately 8-15% g for 2% probability of exceedance in 50 years. This represents relatively low hazard compared to high seismicity regions, but potential for damaging ground shaking exists.

Table 137. Ground Shaking Effects by Modified Mercalli Intensity

MMI Level	Description	Typical Effects	Expected Frequency
MMI III–IV (Weak to Light)	Felt indoors by many people; vibrations similar to a passing truck.	No damage expected; may cause slight rattling of objects. Typically results from small nearby or distant moderate earthquakes.	Relatively frequent (every few years).
MMI V (Moderate)	Felt by nearly everyone; some dishes and windows may break; unstable objects may overturn.	Minor non-structural damage possible to vulnerable structures.	Infrequent (once every few decades).
MMI VI (Strong)	Felt by all; frightening to residents; heavy furniture may move; plaster may crack.	Minor to moderate damage possible to older buildings; chimneys and parapets may sustain damage.	Rare (many decades to centuries between events).
MMI VII (Very Strong)	Difficult to stand; considerable damage to poorly built structures; some wall failures.	Significant damage to unreinforced masonry; moderate damage to standard structures.	Very rare (centuries between events).
MMI VIII+ (Severe to Violent)	Substantial damage to ordinary structures; collapse of poorly built buildings.	Damage to specially designed structures possible; widespread infrastructure damage.	Extremely rare (would require magnitude 6.5+ earthquake; centuries to millennia between events).



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The planning area is most likely to experience MMI III-V shaking from small to moderate earthquakes, with low probability of MMI VI-VII shaking from larger events.

The entire population of Park County (17,718 residents) and all structures (7,000-8,500 buildings) are exposed to earthquake hazard, though vulnerability varies:

Table 138. Higher Vulnerability Population and Structures

Building Type	Characteristics	Estimated Number	Vulnerability Level	Key Concerns
Unreinforced Masonry Buildings (URM)	Brick or stone construction without steel reinforcement; heavy parapets; historic mortar deterioration.	30–60 (primarily in Fairplay and Alma)	High	Prone to collapse of walls and parapets; significant risk to occupants; potential loss of historic downtown character.
Older Wood Frame Structures (Pre-1970s)	Limited structural connections between foundation, roof, and walls; non-engineered design.	2,000–3,000	Moderate to High	Risk of shifting off foundations; chimney collapse; moderate structural failure.
Mobile Homes / Manufactured Housing	Lightweight construction; often unanchored or minimally anchored to foundations; vulnerable utilities.	800–1,200	High	Susceptible to sliding or overturning; utility and gas line breaks; high risk to occupants.
Structures on Steep Slopes	Built on or adjacent to steep terrain; may have partial foundations or piers.	500–1,000	Moderate to High	Foundation instability; risk of landslides or rockfalls; access challenges during response.
Modern Construction (Post-2000)	Built to modern building codes with seismic design provisions and improved structural connections.	1,500–2,500	Low	Generally resilient; limited damage expected even in moderate earthquakes.
One-Story Wood Frame Structures (Level Ground)	Small, flexible structures with strong lateral resistance and good performance in shaking.	Common countywide	Low	Typically sustain only minor, non-structural damage in moderate shaking.



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Table 139. Critical Infrastructure Exposure

Infrastructure Category	Assets / Systems	Vulnerability Characteristics	Key Concerns
Transportation Infrastructure	U.S. Highway 285; Highway 9; Hoosier Pass; 485+ miles of county roads; numerous bridges	Roads and bridges vary in age and design; steep terrain and cuts prone to rockfall and slope movement	Bridge abutment failure; rockfalls blocking Hoosier Pass; slope instability along county roads; loss of primary north–south corridor access
Utility Infrastructure	Water and wastewater systems; electrical distribution (800+ miles of overhead lines); propane and limited natural gas systems	Underground pipelines and tanks subject to rupture or leaks from ground movement; overhead powerlines and substations vulnerable to shaking	Water/wastewater service interruption; fire suppression challenges; fuel or propane leaks; extended power outages
Dams and Reservoirs	Several small dams; Antero Reservoir (edge of county)	Seismic design standards vary by age; potential for structural stress or failure during strong shaking	Dam damage could affect downstream communities; limited seismic retrofits; emergency action plan activation required
Emergency Services Infrastructure	8–10 fire stations; ambulance stations; county EOC (Fairplay); communications towers	Older facilities may not meet modern seismic design; towers located on ridge tops	Continuity of emergency operations; communications loss from tower failure; responder access disruption
Government and Community Facilities	Park County Courthouse; government offices; libraries; 5 public schools; community centers	Mix of modern and historic structures; some older masonry buildings at higher risk	Courthouse and schools must remain functional; schools serve as shelters; loss of public gathering spaces affects recovery operations

Figure 42. Earthquake Vulnerability and Critical Infrastructure

[Map showing vulnerable building concentrations, critical infrastructure, and steep terrain areas]



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Certain populations face elevated risk during and after earthquakes:

Table 140. Vulnerable Populations

Population Group	Vulnerability Characteristics	Key Concerns
Residents in Vulnerable Structures	Individuals living or working in unreinforced masonry buildings, mobile homes, or older structures	Elevated risk of injury or death from partial or full structural collapse during shaking
Elderly Residents	Reduced mobility and physical resilience	Difficulty taking protective actions (drop, cover, hold on); challenges evacuating damaged structures or accessing services; increased risk during utility outages
Young Children	Dependence on caregivers for protection	Require supervision and specialized sheltering; potential school exposure during earthquake; emotional trauma and disruption to care
Individuals with Disabilities	Physical, sensory, or cognitive limitations	Challenges performing protective actions, evacuating, and accessing emergency services; reliance on assistive devices vulnerable to power loss
Rural Residents	Isolated locations with limited emergency access	Delayed emergency response; prolonged infrastructure outages; limited access to alternate shelter or medical care
Highway Travelers	Motorists on U.S. 285 or Highway 9 during shaking	Rockfalls, bridge failure, or roadway damage could trap vehicles; potential for injuries or stranded motorists in remote areas
Workers in Vulnerable Buildings	Employees in older or historic downtown areas (Fairplay, Alma)	Increased exposure risk during work hours in URM or aging commercial structures
Visitors and Tourists	Unfamiliar with local hazards or response procedures	Increased demand on emergency response; language or informational barriers; potential exposure in lodging or recreational areas



Secondary Hazards

Earthquake-induced landslides and rockfalls represent the most significant secondary hazard in Park County's steep mountain terrain:

Table 141. Secondary Hazards

Impact Category	Description	Key Concerns for Park County
Highway Corridors	Highways traversing steep terrain are highly susceptible to rockfalls and landslides during strong shaking.	U.S. 285 through Turkey Creek Canyon and Kenosha Pass; Highway 9 over Hoosier Pass and near Alma. Landslides could block access, isolating communities and hindering emergency response.
Mountain Slopes	Steep slopes may experience widespread slope failures during moderate to strong earthquakes.	Debris slides, rockfalls, and reactivation of ancient landslides threaten roads, structures, and utilities. Structures on slopes face high risk of foundation failure.
Dam Failure	Small dams and reservoirs may sustain damage leading to overtopping or breach.	While most dams are low hazard, failure could cause localized flooding and downstream property damage. Antero Reservoir breach could affect downstream counties.
Fire Following Earthquake	Fires can result from damaged electrical, gas, or propane systems. Fire response may be limited.	Broken water mains, damaged fire stations, and impassable roads could delay suppression. Multiple simultaneous fires could exceed local firefighting capacity.
Utility Failures	Ground shaking may damage power, water, wastewater, and communications infrastructure.	Loss of potable water and power for heating, communications, and emergency response. Propane leaks pose explosion risk. Wastewater failure increases disease potential.
Hazardous Materials Release	Seismic activity can rupture tanks and containment systems.	Propane facilities, fuel storage tanks, and household chemicals pose localized hazards. Secondary fires or contamination possible.
Economic Disruption	Structural damage, transportation interruptions, and utility outages impact all economic sectors.	Business closures, reduced tourism, agricultural losses, and government operation disruption. Long-term recovery challenges likely.
Healthcare System Strain	Medical facilities are limited and lack hospital capacity.	Injuries requiring hospital care must be transported outside the county; damaged roads could delay treatment; local urgent care and EMS could be overwhelmed.



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Impact Category	Description	Key Concerns for Park County
Psychological Impacts	Earthquakes generate widespread stress, fear, and emotional trauma.	Prolonged anxiety from aftershocks; increased mental health needs; displacement and recovery stress; children and elderly most affected.

Earthquakes can interact with other hazards to create compounded risks:

Table 142. Compounded Risk: Earthquakes and Other Hazards

Compound Hazard	Description / Combined Effects	Key Local Implications for Park County
Earthquake + Winter Weather	Earthquake occurring during snow and freezing temperatures compounds response and survivability challenges.	Emergency response slowed by snow and ice; power outages during extreme cold become life-threatening; damaged buildings cannot provide safe shelter; avalanches may be triggered by shaking in steep terrain.
Earthquake + Wildfire	Concurrent or sequential earthquake and wildfire events strain emergency resources and infrastructure.	Damaged water systems impair firefighting; fire department resources divided; potential fire ignitions from damaged utilities; multiple hazards may overwhelm limited county response capacity.
Earthquake + Landslides	Primary compounded risk for Park County due to steep terrain and mountainous soils.	Shaking triggers slope failures that block highways and damage homes; secondary slides possible after rainfall or snowmelt; long-term slope instability creates ongoing hazard zones.
Earthquake + Dam Failure	Seismic shaking damages or overtops small dams, resulting in flooding in already impacted areas.	Flooding compounds structural and transportation damage; access routes and bridges may be washed out; emergency services delayed.
Earthquake + Economic Stress	Earthquake coinciding with or following economic downturn amplifies recovery challenges.	Reduced household and government resources limit recovery capacity; insurance and loan access constrained; prolonged economic hardship and delayed reconstruction.

Lifelines

Earthquakes can impact all seven FEMA community lifelines:



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Table 143. Lifeline Impacts – Earthquakes

Category	Key Impacts and Consequences
Safety and Security	- Structural collapse may cause injuries and fatalities.- Secondary hazards (fires, hazardous materials releases, and landslides) threaten life safety.- Aftershocks create danger for rescue personnel and survivors.- Law enforcement required to maintain order and prevent looting.
Food, Water, and Shelter	- Damaged water systems disrupt access to drinking water and sanitation.- Food distribution impacted by transportation and business interruptions.- Structural damage may render homes unsafe.- Temporary shelters required for displaced residents.
Health and Medical	- Surge in casualties requiring immediate medical care.- Healthcare facilities may be damaged or inoperable (no hospital in Park County).- Injuries among healthcare workers reduce response capacity.- Patient transport to neighboring counties may be delayed due to road damage.
Energy	- Power outages from damage to electrical distribution infrastructure.- Propane and natural gas systems at risk of rupture or leaks.- Fuel supply chains disrupted, affecting emergency and recovery operations.
Communications	- Cell tower and power loss disrupt public and emergency communications.- Landline and network infrastructure damage impairs connectivity.- Emergency communications systems may be inoperable.- Public information dissemination becomes critical for safety and coordination.
Transportation	- Highways and bridges may close due to landslides, rockfalls, or structural failure.- Road damage delays emergency response and prolongs isolation of communities.- Extended closures impact supply chains and economic activity.
Hazardous Materials	- Propane storage tanks, fuel facilities, and small pipelines vulnerable to rupture.- Household hazardous materials may spill, creating localized contamination.- Limited hazmat response capacity within county increases cleanup challenges.

Earthquake hazards are interconnected with multiple other hazards in the planning area:

- Earthquake and Landslides (Primary Secondary Hazard): Earthquake shaking triggers landslides that may cause more damage than direct shaking effects, particularly in Park County's steep terrain.
- Earthquake and Fire: Earthquake-induced fires compound impacts, particularly with damaged water systems impairing suppression.
- Earthquake and Infrastructure Failure: Cascading infrastructure failures compound impacts and extend recovery time.
- Earthquake and Economic Disruption: Economic impacts extend far beyond direct damage costs, affecting recovery and long-term community resilience.



Recent and Future Development

Recent development patterns in Park County affect earthquake vulnerability.

- **Development Growth:** Continued residential and commercial construction increases the number of people and structures exposed to earthquake hazard. However, new construction generally meets modern building codes with seismic provisions, making it more earthquake-resistant than older structures.
- **Aging Infrastructure:** Existing infrastructure continues to age:
 - Bridges designed to older standards
 - Water and wastewater systems aging
 - Older buildings deteriorating
 - Maintenance backlogs increasing vulnerability
 - **Historic Preservation:** Park County values its historic structures, particularly in Fairplay and Alma. Balancing preservation with seismic retrofitting creates challenges.
 - **Critical Facility Investments:** New or upgraded critical facilities (fire stations, emergency operations center, schools) provide opportunities to incorporate seismic design.

Mitigation Opportunities: New development provides opportunities to enhance seismic resilience:

- Building code enforcement ensuring seismic provisions
- Site selection avoiding most hazardous locations (steep slopes, landslide-prone areas, fault traces)
- Infrastructure designed to seismic standards
- Public education on earthquake preparedness

Land Use Planning: Consideration of seismic hazards in land use decisions:

- Identify and avoid most hazardous areas for critical facilities
- Require geologic hazard assessments for development in steep terrain
- Consider seismic hazards in development review

Building Code Enforcement: Consistent enforcement of current building codes ensures new construction is earthquake-resistant.

Retrofit Priorities: Identification of vulnerable structures (particularly critical facilities and high-occupancy buildings) for potential seismic retrofitting.



Changes in Vulnerability

Since the previous HMP update, the planning area's earthquake vulnerability has changed marginally:

- **Increased Exposure:** Population and development growth has increased the number of people and structures exposed to earthquake hazard. Estimated 10% increase in exposed structures.
- **Aging Infrastructure:** Existing infrastructure is now older and potentially more vulnerable, though maintenance and upgrades may offset some deterioration.
- **Enhanced Awareness:** National attention to earthquake preparedness (including central and eastern US earthquake risks) has enhanced public awareness, though earthquake preparedness remains low priority for most residents compared to more frequent hazards.
- **Building Code Improvements:** Modern building codes include seismic provisions that improve new construction resistance, though the majority of Park County's building stock predates these improvements.
- **Emergency Planning:** Emergency planning increasingly incorporates earthquake scenarios, though resources for earthquake-specific preparedness remain limited.
- **Scientific Understanding:** Improved understanding of Colorado seismicity and seismic hazards through ongoing USGS and Colorado Geological Survey research.

Overall Assessment: the planning area's earthquake vulnerability has remained relatively stable, with slight increases due to development exposure offset by improvements in building standards and awareness. The fundamental challenge remains low probability of occurrence reducing prioritization and preparedness investment, but persistent potential for significant impacts if a damaging earthquake occurs.

The most critical vulnerabilities remain:

- Unreinforced masonry buildings in historic districts
- Steep terrain vulnerable to earthquake-induced landslides and rockfalls
- Critical transportation corridors through vulnerable terrain
- Limited emergency response resources
- Aging infrastructure designed to older standards



Consequence Analysis

Table 144. Earthquake Consequence Analysis

Consideration	Description
Public	Earthquakes threaten life safety through structural collapse, falling objects, landslides, and secondary hazards such as fires or dam failures. A magnitude 6.0+ event could result in multiple fatalities and dozens of injuries. Strong shaking may cause psychological trauma and displacement from damaged homes, reducing quality of life. Vulnerable groups—including elderly, disabled, and low-income residents—face heightened risks.
Responders	Search and rescue operations occur under dangerous and unstable conditions, with aftershock risks. Park County’s limited response resources would be quickly overwhelmed, and regional mutual aid could be unavailable during a widespread event. Responders may experience personal losses and stress, affecting their performance and mental health.
Continuity of Operations (Government)	A moderate to major earthquake could significantly disrupt county and municipal operations. Government facilities, including the courthouse, may be damaged or inoperable. Communications systems could fail, and staff availability may decline. Extended emergency operations (weeks to months) would strain resources and budgets. Revenue loss and recovery costs may prolong restoration of services.
Public Confidence in Government	Public trust depends on effective communication and response. Inadequate preparedness, inconsistent messaging, or delays in recovery could erode confidence. Difficult resource allocation decisions—such as prioritizing infrastructure repairs or condemning unsafe buildings—may cause public controversy. Timely federal and state assistance is vital to maintaining confidence in recovery efforts.
Property	Structural damage could range from cosmetic cracks to full collapse depending on magnitude and construction type. Unreinforced masonry (URM) and older pre-1970s structures are especially vulnerable. Approximately 30–60 URM buildings and 2,000–3,000 older structures are at risk. A major earthquake could render hundreds of buildings uninhabitable, with property losses potentially reaching tens of millions of dollars. Historic structures may be permanently lost.
Facilities & Infrastructure	Critical infrastructure—including water systems, electrical networks, and transportation routes—faces high vulnerability. Landslides or bridge damage could isolate communities. Schools, fire stations, and government facilities may sustain damage, impeding response. Dams could experience structural stress, posing secondary flooding risks. Recovery of infrastructure could require months to years and cost tens of millions.
Environment	Direct seismic impacts are limited, but secondary effects include landslides, sedimentation, and hazardous material releases that degrade water quality. Wastewater system failures could create contamination risks. Landslides and



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Consideration	Description
	ground movement may alter habitat and stream morphology, creating long-term ecological impacts.
Economic	Economic losses from an earthquake could be severe and prolonged. Direct physical damage, combined with utility outages, transportation disruptions, and business interruptions, could generate losses from \$50–150 million. Tourism—a key sector in Park County—would likely experience long-term decline. Agricultural operations, supply chains, and local government revenues would all suffer, extending recovery over multiple years.

Multi-Jurisdictional Concerns

Earthquake hazards are inherently multi-jurisdictional due to the regional nature of seismic events and shared infrastructure vulnerabilities:

All jurisdictions share concerns about:

- Earthquakes not respecting jurisdictional boundaries; regional event affects all
- Shared critical infrastructure (highways, utilities) vulnerable countywide
- Limited emergency response resources requiring mutual aid
- Unreinforced masonry buildings in historic districts (Fairplay, Alma)
- Vulnerable transportation corridors isolating communities
- Dependence on hospitals in neighboring counties
- Need for coordinated emergency response and recovery

State Support: The planning area would require substantial state assistance:

- Colorado Division of Homeland Security and Emergency Management coordination
- Colorado Geological Survey for geologic hazards assessment
- Colorado Department of Transportation for highway assessment and repair
- Colorado Division of Fire Prevention and Control for search and rescue
- Colorado Department of Public Health and Environment for health and safety
- Colorado National Guard for security and support

Federal Support: Significant earthquake would require federal assistance:

- FEMA for coordination, resources, and financial assistance
- USGS for seismic monitoring and aftershock assessment
- Federal Highway Administration for bridge and highway assessment
- Army Corps of Engineers for dam safety assessment
- Multiple federal agencies for various support functions



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Neighboring County Coordination: Mutual aid and regional coordination essential:

- Jefferson County: Providing hospital care, search and rescue, emergency services
- Summit County: Mutual aid; could be affected by same earthquake
- Lake County: Mutual aid; adjacent area could be affected
- Teller County: Hospital services; could be affected by same earthquake
- Chaffee County: Hospital services; western access route

Table 145. Multi-Jurisdictional Earthquake Assessment

Jurisdiction / Partner	Shared Earthquake Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide ground shaking; landslides along highways; damage to rural infrastructure	Large rural area with limited emergency response capacity; aging infrastructure; steep terrain prone to landslides	Building code enforcement; critical facility seismic assessment; emergency planning; public education
Town of Fairplay	Downtown unreinforced masonry (URM) buildings; protection of critical services; historic preservation	Historic URM structures; county courthouse and key government facilities; limited emergency resources	URM building evaluation and retrofiting; emergency operations planning; balancing historic preservation with seismic safety
Town of Alma	High elevation community with URM buildings and limited emergency capacity	Historic downtown structures; very small population; resource constraints; elevation complicates access and response	Historic building assessments; emergency planning; regional coordination for resource support
Platte Canyon Fire Protection District (FPD)	Bailey area infrastructure; Highway 285 corridor impacts; residential and commercial structures	Largest population center in county; Highway 285 as primary corridor; steep terrain; aging utilities and structures	Building code enforcement; highway corridor risk reduction; search and rescue capability; public education
Lake George FPD	Rural infrastructure exposure; limited regional access via U.S. Highway 24	Limited resources; moderate population; access challenges to Pike National Forest and backcountry areas	Emergency planning; mutual aid development; public education; infrastructure condition assessment



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Jurisdiction / Partner	Shared Earthquake Concerns	Notable Vulnerabilities	2025 HMP Priorities
North-West FPD	Extremely rural coverage area; limited personnel and equipment; coordination needs	Dispersed population; minimal local infrastructure; volunteer-based response	Mutual aid and interoperability agreements; basic preparedness training; regional support coordination
South Park Ambulance District	Countywide EMS response; patient transport under blocked-road conditions	Distant hospitals; potential highway closures; small workforce; surge in casualties during event	Emergency planning; air transport (helicopter) contingency; mutual aid partnerships; earthquake response training
Hartsel FPD	Remote and low-density service area; limited emergency resources	Sparse population; extended response times; minimal infrastructure	Basic preparedness; coordination with county EOC; participation in regional response plans
Jefferson FPD	Rural infrastructure and limited staff; highway access constraints	Moderate population; aging systems; long distances to mutual aid	Emergency planning; mutual aid; local public education initiatives
Southern Park County FPD	Remote southern service area; minimal facilities; long response distances	Sparse population; rugged terrain; limited communications	Mutual aid coordination; responder training; regional planning
Colorado Geological Survey (CGS)	Statewide seismic and geologic hazard monitoring and mapping	Provides essential technical expertise lacking locally	Post-earthquake building/infrastructure assessment; landslide and fault hazard evaluation; technical public information
Regional Hospitals (Swedish, UCHealth, Heart of the Rockies, St. Anthony Summit)	Regional hospitals expected to receive Park County casualties	Hospitals may sustain earthquake impacts; road closures may delay transport; limited surge capacity	Emergency coordination; patient transfer agreements; redundant communications; regional mass casualty preparedness



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Hazard Summary

Table 146. Earthquake Hazard Summary

Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value at Risk	Risk Category	Key Vulnerabilities / Notes
Park County (Total)	17,718 (100%)	7,000–8,500 (all)	60–80	\$1.2B–\$1.6B (total property value)	Low to Moderate (Probability); High (Consequence)	Entire population and all structures exposed; low probability but potentially high consequence hazard; steep terrain increases landslide susceptibility.
Town of Fairplay	≈ 900	≈ 300–350	4–6	\$50M–\$70M	Moderate (Vulnerability)	Historic downtown with unreinforced masonry (URM) buildings; aging infrastructure; key county government functions located in seismic risk zone.
Town of Alma	≈ 325	≈ 150–200	2–3	\$20M–\$30M	Moderate to High (Vulnerability)	Historic URM buildings; limited emergency resources; small and isolated



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value at Risk	Risk Category	Key Vulnerabilities / Notes
						community at high elevation complicating response operations.
Bailey Area (Platte Canyon FPD)	≈ 6,000–7,000	≈ 1,200–1,400	8–12	\$250M–\$350M	Low to Moderate	Largest population center; Highway 285 corridor exposure; mix of older and newer buildings; steep terrain increases potential for rockfall and slope failure.
Lake George Area	≈ 2,500	≈ 600–700	4–6	\$80M–\$120M	Low to Moderate	Rural infrastructure and aging residential stock; limited healthcare and response capacity; vulnerable to isolation during access disruptions.
Other Unincorporated Areas	≈ 8,000–9,000	≈ 4,000–5,000	30–40	\$600M–\$800M	Low to Moderate	Dispersed rural population; variable vulnerability depending on structure



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Jurisdiction	Population Exposed	Structures Exposed	Critical Facilities Exposed	Estimated Value at Risk	Risk Category	Key Vulnerabilities / Notes
						age and foundation; steep slopes and limited road networks heighten isolation risk.

Table 147. Quantitative Earthquake Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Total Population Exposed	17,718 (100%)	+8%
Total Structures Exposed	7,000–8,500 (all structures)	+10%
Unreinforced Masonry Buildings (URM)	30–60 buildings	Stable (aging and deterioration)
Structures in Steep Terrain (Landslide Risk)	500–1,000	+12%
Critical Bridges	20–30 major bridges	Stable (aging)
Total Property Value at Risk	\$1.2B–\$1.6B	+15%
Annual Probability of Felt Earthquake	30–50%	Stable
Annual Probability of Damaging Earthquake (M5.0+)	<1%	Stable
50-Year Probability of Damaging Earthquake	10–20%	Stable
Seismic Hazard Level (PGA, 2% in 50 yr)	8–15% g	Stable (geology-based)
Known Active Faults in County	Several mapped; low activity rates	Stable (geology-based)
Historical Damaging Earthquakes in County	0 (in ~150-year record)	No change
Emergency Response Capacity	Limited; requires mutual aid for major events	Slightly improved planning



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Exposure Metric	2025 Estimate	Change Since 2020
Hospital in County	0	No change (vulnerability persists)
Public Earthquake Preparedness	Low (other hazards prioritized)	Slightly improved awareness
Building Code Seismic Provisions	Modern codes enforced for new construction	Improved (updated codes)



Hazard: Dam Failure

Background

Park County contains several dams and reservoirs that provide water storage for municipal supply, irrigation, recreation, and other purposes. While these water storage facilities provide essential benefits, dam failure represents a low-probability, high-consequence hazard that could result in catastrophic flooding, loss of life, property destruction, and environmental damage in downstream areas.

A dam failure occurs when a dam's structural integrity is compromised to the point that it can no longer safely impound water, resulting in an uncontrolled release of the reservoir contents. Dam failures can occur suddenly with little warning (catastrophic failure) or gradually over hours or days (slow failure or overtopping), depending on the failure mechanism. The consequences of dam failure depend on the dam's size and storage volume, the population and development in the downstream inundation zone, warning time available, and the ability of emergency responders to evacuate at-risk populations.

Dam failure can be caused by multiple factors: structural deficiencies in the dam embankment or spillway; overtopping due to inadequate spillway capacity during extreme flood events; internal erosion (piping) through or beneath the dam; earthquake-induced damage; foundation failure; spillway gate malfunction; rapid drawdown causing slope instability; vandalism or terrorism (rare); and improper maintenance or operation. Many dams in Colorado and throughout the United States are aging infrastructure, with some constructed decades ago using design standards and construction techniques that may not meet current safety criteria.

The planning area's dams vary significantly in size, age, hazard classification, and condition. The Colorado Division of Water Resources, Office of the State Engineer's Dam Safety Branch regulates dams in Colorado and conducts periodic inspections to assess dam safety. Dams are classified by hazard potential based on the consequences of failure:

- High Hazard: Dams where failure would probably cause loss of human life
- Significant Hazard: Dams where failure may cause loss of human life and significant property damage
- Low Hazard: Dams where failure would cause minimal property damage and no expected loss of life

It is critical to note that "hazard classification" refers to the downstream consequences of failure, not the likelihood of failure or the condition of the dam. A well-maintained dam in excellent condition can still be classified as High Hazard if development exists downstream.

According to the Colorado Dam Safety Branch, Park County contains approximately 15-25 jurisdictional dams (specific number varies as new dams are constructed and old dams are removed or reclassified). Most dams in Park County are relatively small earthen embankments storing water for agricultural irrigation, stock watering, or recreational purposes. However, the county also contains larger facilities including Antero Reservoir—one of the largest reservoirs in the South Park basin—and several other significant water storage structures.



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Dam failure impacts in the planning area would include: catastrophic downstream flooding with high-velocity flows; loss of life and injuries to people unable to evacuate inundation zones; destruction of structures, infrastructure, and property in flow path; road and bridge damage isolating communities; environmental damage from sediment and debris deposition; long-term water supply disruption if failed dam provided municipal or agricultural water; and economic losses from property damage, infrastructure repair, and lost water storage capacity.

The downstream consequences of dam failure depend heavily on development patterns in inundation zones. Sparsely populated areas downstream of some Park County dams limit consequences, while other dams have residential or commercial development, highways, or critical infrastructure downstream that would be severely impacted by failure. Emergency Action Plans (EAPs) are required for high and significant hazard dams, providing protocols for monitoring, warning, and evacuation should failure conditions develop.

Dam failure hazard was evaluated in the planning area's 2025 Hazard Ranking Worksheet. While the probability of dam failure is low for properly maintained facilities, the potential for catastrophic consequences warrants inclusion in comprehensive hazard planning.

Definition

The planning area hereby adopts the definitions as outlined in the 2023 Colorado Enhanced State Hazard Mitigation Plan, the Colorado Division of Water Resources Dam Safety Branch, and federal dam safety standards for the purposes of consistency and alignment with state-level hazard mitigation efforts.

Dam: A barrier constructed across a watercourse or at an off-channel location for the purpose of impounding or diverting water. In Colorado, jurisdictional dams are those that meet size criteria established in state statute (generally dams with structural height of 10 feet or more and storage capacity of 100 acre-feet or more, or smaller dams meeting other criteria).

Dam Failure: Loss of structural integrity of a dam resulting in uncontrolled release of impounded water. Failure can range from partial breaching with some retention of water to complete catastrophic failure releasing the entire reservoir volume.

Breach: An opening through a dam that allows uncontrolled release of impounded water. Breach characteristics (width, depth, formation time) determine the magnitude of downstream flooding.

Overtopping: Flow of water over the top of a dam, typically due to insufficient spillway capacity to pass extreme flood flows. Overtopping can lead to rapid erosion of earthen dams and catastrophic failure.

Piping (Internal Erosion): Progressive erosion of soil within, beneath, or adjacent to a dam embankment, creating channels (pipes) through which water flows with increasing velocity and erosive force. Piping can lead to rapid catastrophic failure.

Sunny Day Failure: Dam failure occurring during normal operating conditions without warning signs such as extreme storms or earthquakes. Sunny day failures, while rare, are particularly dangerous because warning time is minimal.



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Inundation Zone (Inundation Area): The area downstream of a dam that would be flooded by water released in the event of dam failure. Inundation mapping shows the extent, depth, and arrival time of flood waters from dam failure.

Hazard Classification: A rating system based on the potential consequences of dam failure:

- High Hazard: Failure or mis-operation results in probable loss of human life
- Significant Hazard: Failure or mis-operation results in possible loss of human life and significant property or environmental destruction
- Low Hazard: Failure or mis-operation results in no probable loss of human life and low economic losses

Emergency Action Plan (EAP): A formal document prepared by dam owners specifying actions to be taken by the dam owner and emergency management authorities to minimize loss of life and property damage in the event of dam failure or other emergency. EAPs are required for high and significant hazard dams in Colorado.

Spillway: A structure that allows water to pass around, over, or through a dam to prevent overtopping. Spillways can be gated (controlled release) or ungated (automatic release when water reaches spillway crest).

Design Flood: The flood magnitude selected as the basis for design of a dam or spillway, typically expressed as a peak flow rate or hydrograph. The design flood for a dam depends on its hazard classification, with high hazard dams designed for larger floods.

Probable Maximum Flood (PMF): The flood that would result from the most severe combination of meteorological and hydrologic conditions reasonably possible in a region. High hazard dams are typically required to safely pass a significant fraction of the PMF.

Seepage: Water passing through or under a dam embankment or foundation in a controlled manner. Normal seepage is expected and monitored; abnormal seepage (increasing volume, turbid appearance, or new locations) can indicate developing problems.

Instrumentation: Devices installed in or near a dam to monitor its performance, including piezometers (measure water pressure in embankment or foundation), inclinometers (measure movement), and survey monuments (measure settlement and displacement).

Extent and Location

Park County contains 23 state-regulated dams, along with the Altura (Duck Lake) Dam in neighboring Clear Creek County whose drainage flows into the county. Six of these, Antero, Eleven Mile, Jefferson Lake, Montgomery, Spinney Mountain, and Tarryall, are major reservoirs that play critical roles in regional water supply, recreation, and downstream hazard potential. These dams are distributed across multiple watersheds, including the South Platte River, Tarryall Creek, North Fork South Platte River, and Middle Fork South Platte River, with locations ranging from high-elevation mountain settings to lower valley areas near communities such as Fairplay, Jefferson, Hartsel, and Lake George. The size, storage capacity, and downstream exposure of these structures vary widely, but failure of any high-hazard potential dam could result in significant impacts



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to life safety, property, infrastructure, and natural resources within and beyond Park County.

Table 148. Dams Park County

Dam / Reservoir (NID)	Hazard Class	Watershed	Major Reservoir?	Dam Height / Storage / Condition	Owner / Operator & EAP Status	Notes
Antero Dam / Reservoir (CO00277)	High	South Fork South Platte River	Yes	98 ft / 22,100 ac-ft / Satisfactory	Denver Water / EAP Updated Annually	Downstream: Hartsel, Lake George, Spinney Mountain Res., Eleven Mile Res., U.S. 24.
Altura (Duck Lake) Dam*	Low	North Fork South Platte River	No	~25 ft / <500 ac-ft / Fair	Private / No EAP Required	In Clear Creek Co., ~1 mile north of Park Co.; drains into Park Co. (included due to downstream impact).
Baker Dam (CO00893)	Significant	Tarryall Creek	No	30 ft / 450 ac-ft / Fair	Private / EAP Not Required	Small ranch dam, private use.
Bayou Salado Dam (CO00895)	Low	Tarryall Creek	No	28 ft / 310 ac-ft / Fair	Private / EAP Not Required	Ranch and irrigation use; limited downstream exposure.
Buffalo Creek Dam (CO00732)	Low	South Fork South Platte River	No	25 ft / 250 ac-ft / Fair	Private / EAP Not Required	Used for stock watering; isolated location.
Camp Alexander Dam (CO01114)	Significant	South Fork South Platte River	No	35 ft / 800 ac-ft / Fair	YMCA / EAP Not Required	Recreational camp facility; limited exposure.



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Dam / Reservoir (NID)	Hazard Class	Watershed	Major Reservoir?	Dam Height / Storage / Condition	Owner / Operator & EAP Status	Notes
Cline Dam (CO01140)	Low	Tarryall Creek	No	22 ft / 300 ac-ft / Fair	Private / EAP Not Required	Small private agricultural dam.
Eleven Mile Canyon Dam / Eleven Mile Reservoir (CO00278)	High	South Platte River	Yes	204 ft / 97,800 ac-ft / Satisfactory	Denver Water / EAP Updated Annually	Downstream: Lake George, U.S. 24; major Denver Water facility.
Estates Number 1 Dam (CO01284)	Low	Elk Creek	No	18 ft / <100 ac-ft / Fair	Private / EAP Not Required	Minor local hazard; no population at risk.
Jefferson Lake Dam / Jefferson Lake (CO00280)	Significant	Tarryall Creek	Yes	65 ft / 7,700 ac-ft / Satisfactory	City of Aurora / EAP Current	Downstream: Jefferson, Tarryall Reservoir, U.S. 285.
Joe Wilson Recreation Dam (CO01119)	Low	South Platte River	No	20 ft / <100 ac-ft / Fair	Private / EAP Not Required	Recreation and irrigation use.
Lake George Dam / Reservoir (CO01226)	Low	South Platte River	No	27 ft / 150 ac-ft / Fair	Private / EAP Not Required	Small local facility serving recreation and ranch uses.
Liningier Lake Dam (CO01264)	Low	North Fork South Platte River	No	22 ft / 120 ac-ft / Fair	Private / EAP Not Required	Small mountain lake impoundment; recreational use.
Lower Michigan Dam (CO01332)	Low	Tarryall Creek	No	18 ft / <100 ac-ft / Fair	Private / EAP Not Required	Agricultural use; no major exposure.
Montgomery Dam /	Significant	Middle Fork South	Yes	55 ft / 1,800 ac-ft	Colorado Springs Utilities /	Failure could impact Hwy 24, Lake



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Dam / Reservoir (NID)	Hazard Class	Watershed	Major Reservoir?	Dam Height / Storage / Condition	Owner / Operator & EAP Status	Notes
Reservoir (CO00279)		Platte River		/ Satisfactory	EAP Current	George Fire Station #1, CR 77 & CR 11.
OYE Dam (CO01191)	Low	South Fork South Platte River	No	28 ft / 400 ac-ft / Fair	Private / EAP Not Required	Agricultural and stock water use.
Spinney Mountain Dam / Reservoir (CO00281)	High	South Platte River	Yes	95 ft / 53,700 ac-ft / Satisfactory	City of Aurora / EAP Updated Annually	Downstream: Lake George, Eleven Mile Reservoir, U.S. 24.
Tarryall Dam / Reservoir (CO00282)	Significant	Tarryall Creek	Yes	110 ft / 18,700 ac-ft / Satisfactory	Colorado Parks & Wildlife / EAP Current	Downstream: Tarryall; private subdivisions near Lake George.
Tarryall Ranch Reservoir No. 1 Dam (CO01331)	Low	Tarryall Creek	No	25 ft / 400 ac-ft / Fair	Private / EAP Not Required	Small agricultural facility.
Upper Michigan Dam (CO01333)	Low	Tarryall Creek	No	20 ft / <100 ac-ft / Fair	Private / EAP Not Required	Small ranch dam; minimal downstream exposure.
Wagon Tongue Dam (CO01147)	Low	South Platte River	No	24 ft / 160 ac-ft / Fair	Private / EAP Not Required	Ranch use; small facility.
Wagon Tongue No. 2 Dam (CO01148)	Low	South Platte River	No	26 ft / 190 ac-ft / Fair	Private / EAP Not Required	Minor local hazard; limited exposure.
Whiteford Lake Dam (CO01291)	Low	North Fork South	No	22 ft / 180 ac-ft / Fair	Private / EAP Not Required	Recreational property; low



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Dam / Reservoir (NID)	Hazard Class	Watershed	Major Reservoir?	Dam Height / Storage / Condition	Owner / Operator & EAP Status	Notes
		Platte River				hazard potential.

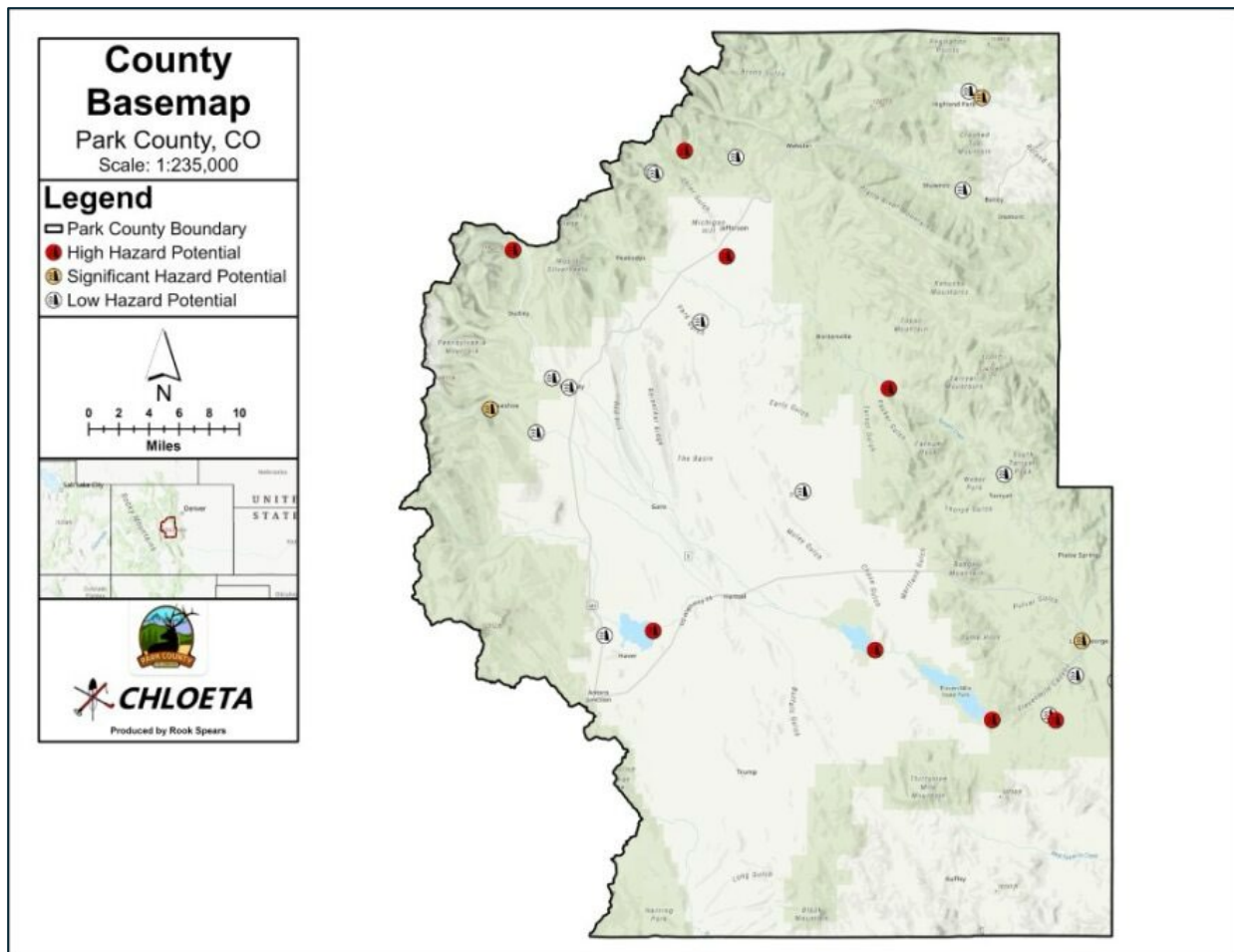


Figure 43. Park County Dam Inventory

The most significant dam failure concerns in the planning area relate to larger facilities with substantial storage and downstream development:

Eleven Mile Canyon Dam / Eleven Mile Reservoir: This facility, located on the South Platte River near Lake George, represents one of the highest consequence dam failure scenarios in Park County. The dam impounds over 97,000 acre-feet of water. Failure would send a massive flood wave down the South Platte River through Eleven Mile Canyon and into downstream areas including Lake George and beyond. Highway 24, a critical regional transportation corridor, parallels the river and would be severely



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impacted. Residential development, ranches, campgrounds, and recreation areas in the canyon and downstream would face catastrophic flooding.

Cheesman Reservoir Dam: While Cheesman Dam is an engineering landmark (completed 1905, tallest dam in the world at the time), it is also a high hazard facility. Located upstream of Park County near Deckers, failure would impact downstream areas including portions of Park County. The dam impounds approximately 79,000 acre-feet. Failure would send a flood wave through the South Platte Canyon, impacting Highway 67, campgrounds, residences, and downstream communities. This dam is owned and meticulously maintained by Denver Water.

Antero Reservoir Dam: Located in the South Park basin near Hartsel, Antero Reservoir (approximately 20,000-25,000 acre-feet storage) serves Denver Water and other purposes. The dam is classified as Significant to High Hazard due to downstream concerns. Failure would impact Highway 24, ranches, and areas along the Middle Fork South Platte River downstream toward Spinney Mountain Reservoir and eventually Eleven Mile Reservoir.

Spinney Mountain Reservoir Dam: This Colorado Parks and Wildlife facility stores approximately 26,000 acre-feet for recreation and fisheries. Classified as Significant Hazard, failure would primarily impact areas along the South Platte River downstream, with limited residential development but impacts to Highway 24 and ranches.

Smaller Dams: Park County contains numerous smaller dams (ranch ponds, stock watering reservoirs, small irrigation reservoirs). Most are classified as Low Hazard due to limited downstream development, though some may be Significant Hazard if structures, roads, or other infrastructure exist downstream. Even small dam failures can cause localized property damage, road washouts, and impacts to downstream landowners.

Dam failure inundation zones are the areas that would be flooded by dam failure, vary for each dam based on reservoir volume, dam height, topography, and downstream channel characteristics. The Colorado Dam Safety Branch requires dam owners of high and significant hazard dams to prepare inundation maps showing:

- Maximum extent of flooding from dam failure
- Flood depth and velocity at key locations
- Arrival times of flood wave at critical points
- Structures, roads, and infrastructure in inundation zone
- Areas requiring evacuation

Inundation maps are developed using hydraulic modeling that simulates dam breach formation and downstream flood wave propagation. These technical maps are incorporated into Emergency Action Plans.

Mountain Canyon Settings (Eleven Mile Canyon, South Platte Canyon): Dams located in narrow mountain canyons can produce extreme flood depths and velocities in the canyon. Flood waves can reach 20-40+ feet in depth with velocities exceeding 20-30 feet per second. Everything in the canyon would be destroyed or heavily damaged. As the flood wave moves downstream and the valley widens, flood depths decrease but inundation extent widens, affecting broader areas.

Valley Settings (South Park basin): Dams in broad valley settings produce flood waves that spread across the valley floor. Peak depths may be lower than canyon settings (5-



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15 feet depending on location and dam size), but inundation extent is broader, potentially affecting large areas of agricultural land, scattered residences, and highway corridors.

Arrival Times: The time required for flood waters to reach specific downstream locations depends on distance, slope, and channel characteristics:

- Immediately downstream (within 1 mile): 5-15 minutes
- 2-5 miles downstream: 15-45 minutes
- 5-10 miles downstream: 30-90 minutes
- 10+ miles downstream: 1-3 hours or more

These arrival times are estimates and vary by specific dam and topography. Steep mountain drainages produce faster-moving flood waves than low-gradient valley settings.

Figure 44. Park County Major Dams and Inundation Concerns

Map showing locations of high and significant hazard dams

Population exposure to dam failure varies by facility:

Eleven Mile Canyon Dam / Eleven Mile Reservoir: Downstream inundation zone includes:

- Lake George community (population ~600-800): Significant portion of community in inundation zone; residential and commercial structures
- Highway 24 corridor: Critical transportation route; campgrounds and recreation areas
- Ranches and rural residences: 50-100+ structures in broader inundation zone
- Eleven Mile Canyon: Extreme hazard zone; campgrounds, day-use areas, Highway 24
- Estimated population at risk: 500-1,000 residents plus recreationists and travelers (can exceed 1,000+ people on peak recreation days)

Cheesman Dam: Downstream areas (extending into and beyond Park County):

- South Platte Canyon campgrounds and recreation areas
- Highway 67 corridor
- Downstream communities in Jefferson and Douglas Counties
- Estimated population at risk in Park County portion: 200-500 people (varies by season)

Antero Reservoir Dam: Downstream inundation zone includes:

- Highway 24 crossings
- Ranches and scattered rural residences: 20-50+ structures
- South Platte River corridor toward Spinney Mountain Reservoir
- Estimated population at risk: 50-150 residents plus highway travelers

Spinney Mountain Dam: Limited residential development downstream; primarily impacts:

- Highway 24 (downstream crossings)
- Ranches and open land
- South Platte River riparian areas
- Estimated population at risk: 20-50 people



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Smaller Dams: Individual small dams typically have very limited populations at risk (0-20 people for most Low Hazard facilities), though Significant Hazard classifications indicate potential for greater impacts.

Critical Infrastructure in Inundation Zones:

- **Highway 24:** This critical east-west transportation corridor through Park County crosses multiple dam inundation zones. Failure of Eleven Mile Canyon Dam, Antero Reservoir Dam, or Spinney Mountain Dam would impact Highway 24, potentially washing out sections and severing this important route.
- **Highway 67:** Cheesman Dam failure would impact Highway 67 through South Platte Canyon, affecting this north-south route.
- **Bridges:** Multiple bridges on Highway 24, Highway 67, and county roads cross rivers and streams that would carry dam failure flood waves. Many bridges would be destroyed or severely damaged.
- **Utilities:** Electrical transmission lines, communication infrastructure, and other utilities parallel river corridors in some areas and would be damaged by dam failure flooding.
- **Water Systems:** Some downstream water systems (wells, intakes, treatment facilities) could be damaged by flood forces or sediment deposition.
- **Recreation Facilities:** Campgrounds, fishing areas, boat ramps, and other recreation facilities in inundation zones would be destroyed.

According to the 2023 Colorado Enhanced State Hazard Mitigation Plan, dam failure is a statewide concern. Colorado contains over 1,800 jurisdictional dams regulated by the Dam Safety Branch, including approximately 400 high hazard dams and 300+ significant hazard dams. Many dams are aging infrastructure requiring ongoing maintenance and, in some cases, rehabilitation or removal.

The State HMP notes that while actual dam failures are rare in Colorado (especially failures causing loss of life), the consequences of failure at high hazard facilities could be catastrophic. Colorado has experienced several dam failures and near-failures in recent decades:

- 1976: Lawn Lake Dam failure in Rocky Mountain National Park killed 3 people, caused extensive damage in Estes Park
- 1982: Castlewood Canyon Dam failure (older failed dam from 1933) remnants washed out during flood
- Various years: Multiple small dam failures causing localized property damage
- Near-failures and emergency spillway activations during extreme flood events (2013 floods, other events)

Park County's dam failure risk is consistent with other Colorado mountain counties containing significant water storage facilities. Neighboring counties including Jefferson, Clear Creek, Summit, Lake, Teller, and Chaffee all have high hazard dams with similar concerns.

The state's Dam Safety Program conducts regular inspections, requires Emergency Action Plans, and works with dam owners to ensure facilities meet safety standards.



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However, limited funding for dam maintenance and rehabilitation, aging infrastructure, and increasing downstream development continue to present challenges.

Previous Occurrences

Park County has not experienced a catastrophic dam failure resulting in loss of life or major property damage in its modern recorded history. However, several incidents and concerns have occurred:

Table 149. Notable Events

Date / Period	Dam / Location	Event / Concern	Outcome / Impacts
Various years	Multiple small private dams	Overtopping during spring runoff or heavy rainfall events	Minor downstream flooding; limited property damage; no injuries; repairs required
2013 (September)	Multiple dams countywide	Extreme rainfall and flooding; dam safety concerns	Several dams experienced high water and stress; inspections conducted; some repairs required; no failures occurred
Various years	Ranch ponds and small irrigation dams	Spillway erosion, seepage concerns, embankment settling	Identified during inspections; repairs ordered by Dam Safety; facilities brought into compliance
Ongoing	Eleven Mile Canyon Dam	Routine monitoring and maintenance	Dam Safety inspections; maintenance conducted by Denver Water; no failure incidents; facility well-maintained
Ongoing	Cheesman Dam	Routine monitoring and maintenance	Dam Safety inspections; seismic monitoring; maintenance by Denver Water; historical significance recognized; no failure incidents
Ongoing	Antero Reservoir Dam	Routine monitoring and maintenance	Dam Safety inspections; owner compliance; no failure incidents
Various years	Multiple dams	Identified deficiencies during inspections	Dam Safety Branch issues orders for repairs or modifications; owners compliant; facilities improved

While Park County has been fortunate to avoid dam failures, incidents in other parts of Colorado and nationally demonstrate the potential:

- **Lawn Lake Dam Failure (Rocky Mountain National Park, 1976):** On July 15, 1976, this earthen dam in Rocky Mountain National Park failed catastrophically, releasing approximately 220 acre-feet of water. The flood wave killed 3 people in a



downstream campground, destroyed bridges and roads, caused extensive damage to Estes Park, and resulted in estimated \$31 million in damages (1976 dollars). This disaster led to significant improvements in dam safety programs.

- Castlewood Canyon Dam (Douglas County, original failure 1933): This dam failed in 1933 during high water, sending a flood wave down Cherry Creek into Denver. Two people were killed, and significant damage occurred. While this failure predates modern dam safety programs, it demonstrates the potential consequences.
- Other Small Dam Failures: Colorado has experienced multiple failures of small, often privately-owned dams over the decades. Most caused localized property damage without loss of life, but they demonstrate that dam failures do occur.

Dam failures occur periodically throughout the United States:

- Oroville Dam spillway crisis (California, 2017): Near-failure requiring evacuation of
- Edenville and Sanford Dams (Michigan, 2020): Failures caused by overtopping during extreme rainfall; 10,000 evacuated; extensive damage
- Numerous small dam failures annually across the U.S.

The Association of State Dam Safety Officials (ASDSO) maintains a database of dam failures and incidents. While catastrophic failures of well-maintained high hazard dams are rare, the potential exists, and ongoing vigilance is required.

Park County's dams have experienced high-stress periods during:

- Spring runoff: Particularly high snowpack years with rapid melt and high inflows
- Extreme rainfall events: September 2013 floods and other intense precipitation events
- Combined events: High snowpack followed by warm rain-on-snow events create extreme inflows

These periods require close monitoring, operation of spillways, and in some cases emergency drawdown of reservoirs to maintain safe conditions. The fact that no failures have occurred reflects credit to dam owners, operators, and the Dam Safety Program, but does not eliminate future risk.

Many dams in Colorado and Park County were constructed decades ago:

- Cheesman Dam: Completed 1905 (over 115 years old)
- Eleven Mile Canyon Dam: Completed early 1930s (90+ years old)
- Various smaller dams: 40-70+ years old

While age alone does not determine safety (older dams can be well-maintained and safe), aging infrastructure requires ongoing investment in maintenance, monitoring, and potential rehabilitation to ensure continued safe operation.

Disaster Declarations

Park County has not received federal disaster declarations specifically for dam failure events, consistent with the fact that no catastrophic dam failures have occurred in the county. The lack of historical dam failure disasters does not diminish the potential for



future events. Emergency planning and preparedness are critical despite low probability of occurrence.

Probability of Future Occurrence

Estimating the probability of dam failure is complex and depends on multiple factors including dam condition, maintenance practices, design adequacy, operating procedures, and exposure to triggering events (extreme floods, earthquakes).

Table 150. Annual Probability Assessments

Event Type	50-Year Probability	Notes
At least one serious dam safety incident or small dam failure	60–80%	High likelihood of at least one significant dam-related incident during the planning period.
Major (High or Significant Hazard) dam failure	10–25%	Low probability, but non-negligible; major consequences if such an event occurs.
Multiple small dam failures or incidents	80–95%	Very high likelihood of multiple small-scale failures or safety events over 50 years.

These probabilities reflect the fact that while individual annual probabilities are low, cumulative probability over extended periods becomes more significant.

Table 151. Future Dam Failure Probability Influence Factors.

Category	Factor	Description / Effect
Increasing Factors	Aging Infrastructure	Many dams were designed and constructed several decades ago; deterioration over time increases the likelihood of structural issues or performance limitations.
	Deferred Maintenance	Economic or resource constraints may delay maintenance and rehabilitation, allowing minor deficiencies to worsen.
	Increasing Downstream Development	Expanding residential and commercial areas downstream increase the consequences of potential failure, leading to reclassification and heightened regulatory scrutiny. (Note: This does not increase failure probability but raises overall risk.)
	Climate Variability	More frequent and intense precipitation, drought, and rapid freeze-thaw transitions can stress dam structures and hydrologic systems beyond design assumptions.
	Aging Materials	Concrete, steel, and earthen components naturally degrade over time, reducing strength and resilience.



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Category	Factor	Description / Effect
	Changing Design Standards	Older dams may not meet modern design or seismic criteria, increasing vulnerability under extreme loading or hydrologic conditions.
Decreasing Factors	Improved Dam Safety Programs	State and federal dam safety programs have enhanced inspection frequency, monitoring, and regulatory oversight, reducing unrecognized risks.
	Better Engineering and Modeling	Advances in geotechnical and hydrologic modeling improve understanding of dam performance and inform preventive maintenance or retrofits.
	Instrumentation and Monitoring	Modern monitoring systems detect movement, seepage, or stress changes early, enabling proactive intervention before structural failure.
	Owner Investment	Major dam owners such as Denver Water and Colorado Parks and Wildlife allocate resources for maintenance, upgrades, and modernization.
	Emergency Action Plans (EAPs)	Updated EAPs improve preparedness, early warning, and coordination, reducing life-safety consequences even if failure risk persists.
	Dam Removals	Removal of obsolete or unsafe dams eliminates certain risks entirely, reducing the number of at-risk structures within the county.

The probability of catastrophic dam failure in the planning area remains low for major well-maintained facilities but cannot be reduced to zero. Small dam failures or incidents will likely continue to occur periodically. The consequences of failure, particularly for high hazard dams, warrant ongoing attention to dam safety despite low probability.

Dam failures are typically triggered by specific events or conditions:

- **Extreme Hydrologic Events:** Large floods exceeding spillway capacity can cause overtopping and rapid failure of earthen dams. Climate variability and potential for extreme events create ongoing concern.
- **Earthquakes:** While Park County has low to moderate seismic hazard, earthquakes can damage dams through ground shaking, liquefaction, or landslides into reservoirs. Seismic design is incorporated into modern dams, but older facilities may have limited seismic capacity.
- **Internal Erosion / Piping:** Progressive erosion within embankment or foundation can occur gradually and may not be detected until failure is imminent. Proper design, construction, and monitoring minimize this risk.
- **Structural Deterioration:** Aging concrete, spillway erosion, or foundation issues can develop over time, requiring rehabilitation.



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- Operational Errors: Improper operation of gates, inadequate monitoring, or other human errors can contribute to failures.
- Vandalism / Terrorism: While extremely rare, intentional damage to dams is theoretically possible.

Economic impacts from dam failures would be catastrophic for major facilities and substantial even for smaller dams. Costs include direct flood damage, loss of life and injuries, infrastructure destruction, long-term economic disruption, and dam reconstruction or removal.

Table 152. Future Dam Failure Costs

Scenario	Description / Assumptions	Estimated Costs / Impacts	Frequency / Probability
No Dam Failure (Base Case)	Routine dam safety, maintenance, and preparedness costs to prevent failures.	Dam Safety Branch inspections: \$5K–\$15K/yr Owner maintenance and monitoring: \$50K–\$200K/yr EAP updates and exercises: \$10K–\$25K/yr Instrumentation and monitoring: \$15K–\$40K/yr Public preparedness and education: \$5K–\$10K/yr Total Annual Base Costs: \$85K–\$290K	Occurs annually (preventive investment)
Small Dam Failure (Low or Significant Hazard, <500 acre-ft storage)	Localized flooding from small private, agricultural, or low-hazard dams. Typically affects nearby property, roads, and farmland.	Property damage (2–20 structures): \$200K–\$2M Agricultural losses: \$50K–\$300K Infrastructure damage: \$100K–\$500K Emergency response: \$20K–\$80K Environmental cleanup: \$30K–\$150K Loss of storage: \$50K–\$200K Total: \$450K–\$3.23M/event	1–3% annual probability (≈ once every 10–30 years)
Major Dam Failure (High/Significant)	Catastrophic failure of a major dam causing	Loss of Life: 5–50+ potential fatalities	<0.5% annual



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Scenario	Description / Assumptions	Estimated Costs / Impacts	Frequency / Probability
Hazard, Large Storage – e.g., Eleven Mile Canyon, Cheesman, Antero)	downstream flooding, fatalities, and long-term economic disruption.	(immeasurable human loss). Direct Flood Damage: Residential: \$30M–\$120M Commercial: \$5M–\$20M Agricultural: \$3M–\$10M - Infrastructure: \$20M–\$50M Vehicles/equipment: \$5M–\$15M Total Direct: \$63M–\$215M Indirect Costs: Response/search & rescue: \$1M–\$3M Temporary housing: \$2M–\$8M Business interruption: \$10M–\$30M Environmental cleanup: \$3M–\$10M Water supply disruption: \$5M–\$20M Highway closures/detours: \$2M–\$8M Long-term community impacts: \$5M–\$20M Total Indirect: \$28M–\$99M Total Major Dam Failure Cost: \$91M–\$314M+ (excluding loss of life) Reconstruction/Removal: Rebuild: \$20M–\$100M+ Removal: \$5M–\$30M	probability (≈ 1 in 200-year event)

These estimates are highly uncertain and depend on specific failure circumstances. Actual costs could be lower if failure occurs in winter with minimal population exposure, or higher if failure occurs during peak summer recreation season with maximum exposure.



Cheesman Dam, while well-maintained, represents an extreme consequence scenario if failure were to occur. This facility is one of the oldest and most significant dams in the region. Failure would impact areas well beyond Park County (downstream into Jefferson and Douglas Counties) with total regional impacts potentially exceeding \$500 million to \$1 billion+ and potential for dozens of casualties.

Probability-weighted expected annual costs considering all dam failure scenarios under current conditions would be between \$200,000-\$600,000 annually. This annualized figure represents the long-term average annual cost when all scenarios (no failure, small failures, major failure) are weighted by probability. Actual costs in any given year are likely to be base costs only (no failure) or catastrophic costs (major failure), with little middle ground.

Table 153. Dam Failure Cost Scenarios Summary

Scenario	Probability	Estimated Total Cost	Key Impacts
No Failure (Base)	>99% annually	\$85,000–\$290,000 annually	Routine dam safety operations, inspections, maintenance, monitoring, and emergency planning.
Small Dam Failure	1–3% annually (≈ once every 10–30 years)	\$450,000–\$3.2 million per event	Localized flooding; limited property and infrastructure damage; no expected fatalities; potential road washouts and agricultural losses.
Major Dam Failure	<0.5% annually (≈ once every 100–300 years)	\$91–\$314 million+ per event	Catastrophic downstream flooding; potential loss of life; widespread structural and infrastructure destruction; prolonged economic and community recovery impacts.

Investments in dam safety show extremely favorable cost-benefit ratios given the catastrophic costs of failure:

- **Dam Maintenance and Monitoring:** For every \$1 invested in proper dam maintenance, an estimated \$10-\$50 in failure costs are avoided. Benefit-cost ratios of 10:1 to 50:1.
- **Dam Safety Inspections:** Professional inspections identify problems early when correction is relatively inexpensive. Benefit-cost ratios of 20:1 to 100:1.
- **Emergency Action Plans and Exercises:** EAP development and maintenance has minimal cost (\$10,000-\$30,000 every few years) but can save lives and reduce property damage if failure conditions develop. Benefit-cost ratios of 50:1 to 500:1.
- **Instrumentation and Monitoring:** Installation of piezometers, inclinometers, and other monitoring devices (\$20,000-\$100,000) allows early detection of problems. Benefit-cost ratios of 15:1 to 75:1.



- **Spillway Upgrades:** Improving spillway capacity to safely pass larger floods reduces overtopping risk. Benefit-cost ratios of 3:1 to 10:1.
- **Dam Rehabilitation or Removal:** Major rehabilitation projects (\$1M-\$20M+) or dam removal (\$500K-\$5M) are expensive but may be necessary for dams that cannot be cost-effectively maintained. Benefit-cost ratios of 2:1 to 8:1 depending on consequences of failure.
- **Early Warning Systems:** Installation of automated monitoring and warning systems (\$50,000-\$200,000) can provide critical additional warning time. Benefit-cost ratios of 10:1 to 50:1.
- **Public Education:** Informing downstream residents about dam failure risks and evacuation procedures has minimal cost but significant life safety benefits. Benefit-cost ratios of 100:1 or higher.

Risk and Vulnerability

Dam failure risk in the planning area is characterized by low probability but potentially catastrophic consequences, with risk concentrated in specific downstream inundation zones.

The structural integrity and failure probability of individual dams depends on multiple factors:

High-Quality, Well-Maintained Dams (Eleven Mile Canyon, Cheesman, Spinney Mountain, Antero): These facilities are owned and operated by well-resourced entities (Denver Water, Colorado Parks and Wildlife) with strong dam safety programs:

- Regular professional inspections
- Instrumentation and monitoring programs
- Routine maintenance and repairs
- Financial capacity for major rehabilitation if needed
- Emergency Action Plans in place
- Compliance with Dam Safety Branch requirements

These dams have very low structural failure probability, but risk cannot be reduced to zero. Extreme triggering events (unprecedented floods, major earthquakes) or unforeseen conditions could still cause failure.

- **Small Private Dams** (Ranch Ponds, Small Irrigation Reservoirs): These facilities vary widely in condition and management as some are well-maintained with attentive owners. Others may have deferred maintenance or absentee owners. Financial constraints may limit repairs. There may be limited professional oversight (except Dam Safety inspections). Small private dams have higher relative failure probability, though consequences are generally limited.
- **Aging Dams:** Facilities constructed decades ago face challenges as they are designed to older standards (may not meet current criteria), materials deteriorating with age, may lack modern instrumentation and require ongoing investment to maintain safety.



- Dam Safety Program Effectiveness: Colorado's Dam Safety Branch conducts inspections and can order repairs or modifications. This regulatory oversight significantly reduces risk by identifying problems and ensuring correction. However, limited resources and competing priorities create challenges.
- Overtopping—flow of water over the top of a dam due to insufficient spillway capacity—is a leading cause of earthen dam failures nationwide. Hydrologic risk depends on:
- Spillway Design Adequacy: High hazard dams in Colorado must safely pass a large fraction of the Probable Maximum Flood (PMF). Older dams may have been designed to smaller floods and could be vulnerable to extreme events.
- Extreme Precipitation and Runoff: Climate variability can produce extreme hydrologic events to include record snowpack followed by warm rapid melt, Intense rainfall events (similar to September 2013 floods), Rain-on-snow events, multiple storms in rapid succession filling reservoirs
- Reservoir Operations: Proper reservoir management (maintaining freeboard, operating spillways appropriately) is critical. Operational errors can increase overtopping risk.
- Climate Change Considerations: Potential for increasing hydrologic variability and extreme events may stress dams designed to historical hydrology. Some facilities may require spillway upgrades.
- Seismic Design: Modern dams incorporate seismic design provisions. Older dams (Cheesman, Eleven Mile Canyon, others) were constructed before modern seismic standards and may have limited seismic capacity.
- Embankment Liquefaction: Saturated earthen embankments can lose strength during earthquake shaking, potentially causing slope failures or breaching.
- Spillway and Appurtenance Damage: Concrete spillways, gates, and control structures can be damaged by earthquake shaking.
- Reservoir-Induced Seismicity: Large reservoirs can potentially induce small earthquakes, though this is generally not a significant concern at Park County facilities.
- Landslides into Reservoirs: Earthquake shaking can trigger landslides on steep slopes around reservoirs, potentially causing waves that overtop dams.

The probability of earthquake-induced dam failure is very low in the planning area, but the scenario cannot be dismissed entirely due to:

- Internal erosion (piping) through or beneath earthen embankments is a leading cause of dam failures. Risk factors include:
- Embankment Construction: Properly compacted, well-graded soils resist erosion. Poorly constructed embankments are vulnerable.
- Foundation Conditions: Permeable foundations or foundations with soluble materials can allow piping.
- Aging and Deterioration: Cracks from settlement, desiccation, or other causes can initiate erosion pathways.
- Animal Burrows: Burrowing animals can create pathways for water flow.



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- Vegetation: Tree roots and other vegetation on embankments can create preferential flow paths.
- Detection and Monitoring: Regular inspections, instrumentation (piezometers), and monitoring of seepage can detect developing piping before catastrophic failure.

Population exposure to dam failure is concentrated in downstream inundation zones:

Table 154. Population Exposure

Dam / Location	Exposure Category	Estimated Population at Risk	Structures at Risk	Key Areas / Notes
Eleven Mile Canyon Dam (Downstream Areas)	Highest Exposure	1,000–2,000+ residents, recreationists, and travelers	300+ structures	Lake George community (≈600–800 residents), Eleven Mile Canyon campgrounds, recreation areas, and Highway 24 corridor; includes ranches and rural residences (50–100 structures; 100–200 residents). Highway 24 supports thousands of daily travelers.
Cheesman Dam (Downstream to Park County)	Moderate to High Exposure	200–500 residents	Scattered residential and recreational structures	South Platte Canyon recreation areas and homes along Highway 67; downstream flow extends into Jefferson and Douglas Counties.
Antero Dam	Moderate Exposure	50–200 residents	Scattered ranch and residential structures	Highway crossings, ranchlands, and isolated homes near the South Park Basin.
Spinney Mountain Dam	Moderate Exposure	50–200 residents	Scattered ranch and residential structures	Similar exposure pattern as Antero; low-density development with agricultural uses.
Small Private and Agricultural Dams	Lower Exposure	0–100 residents	0–40 structures	Most low-hazard facilities affect 0–20 people; significant-hazard dams affect 20–100+. Localized impacts confined to immediate downstream areas.



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Critical Infrastructure Exposure includes:

Table 155. Critical Infrastructure Exposure

Infrastructure Category	Assets / Features	Exposure and Potential Impacts
Transportation Infrastructure	Highway 24 (east–west corridor)- Highway 67 (Cheesman Dam area)- 10–20+ bridges in inundation zones- County road network (multiple crossings)	Highway 24 crosses inundation zones from Eleven Mile Canyon, Antero, and Spinney Mountain Dams; major regional route could be destroyed or blocked. Highway 67 lies within Cheesman Dam inundation area; likely impassable. Multiple bridges and road sections would be destroyed or severely damaged. Numerous county roads intersect inundation paths, isolating rural communities.
Utility Infrastructure	Electrical transmission and distribution lines along river corridors- Communication towers and related infrastructure- Water system intakes, wells, and treatment facilities- Wastewater collection and treatment systems	Power and communication infrastructure in river corridors subject to damage or loss. Water and wastewater utilities downstream of dams vulnerable to inundation and contamination. Loss of service to communities and emergency facilities likely.
Recreation Infrastructure	Campgrounds (Eleven Mile Canyon, South Platte Canyon)- Fishing access areas, boat ramps, trails, and trailheads- U.S. Forest Service and state park facilities	Recreation areas directly within inundation zones; potential for loss of life if occupied. Severe damage or total destruction of recreation infrastructure. Long-term economic impacts due to closure of major recreation sites.
Emergency Services Infrastructure	Fire stations and emergency facilities (outside inundation zones)- Emergency access routes (Highways 24 and 67, county roads)	No fire stations or EOCs within inundation areas, but primary access routes likely severed. Emergency response and evacuation operations delayed or prevented by damaged bridges and impassable roads.



Infrastructure Category	Assets / Features	Exposure and Potential Impacts
		Mutual aid response from neighboring jurisdictions significantly hindered.

Figure 45. Dam Failure Inundation Zones and Critical Infrastructure

[Map showing major dam, population centers, highways, and critical infrastructure]

Certain populations face elevated risk from dam failure:

- Residents in Inundation Zones: People living or working in areas directly downstream of dams face the highest risk. Many may be unaware of dam failure risk or not understand inundation zone implications.
- Recreationists: Campers, anglers, and other recreationists in canyons and riparian areas face extreme risk, particularly in Eleven Mile Canyon and South Platte Canyon. These populations are transient and may not be aware of risk.
- Elderly and Disabled Residents: Individuals with limited mobility face challenges evacuating quickly if dam failure warning is issued.
- Overnight Campers: People sleeping in tents or RVs in campgrounds have limited warning time to evacuate if failure occurs at night.
- Highway Travelers: Drivers on Highway 24 and Highway 67 in inundation zones could be caught by flood wave with little warning. High traffic volumes during peak recreation season increase exposure.
- Institutional Populations: Any group facilities (camps, retreats, conference centers) in inundation zones could have large numbers of people requiring evacuation.
- Workers: Ranchers, utility workers, and others working in inundation zones during the day.
- Limited Awareness Population: Many downstream residents and recreationists may not be aware they are in dam failure inundation zones. Public education is critical but challenging.

Dam failure creates unique warning and evacuation challenges:

- Limited Warning Time: Catastrophic "sunny day" failures can occur with minimal warning (minutes to hours). Even with monitoring systems, time between failure detection and arrival of flood wave may be insufficient for complete evacuation, particularly in immediate downstream areas.
- Night-Time Failures: Failures occurring at night create enormous challenges alerting and evacuating sleeping populations.
- Communication Difficulties: Reaching transient recreationists, highway travelers, and rural residents with limited communication infrastructure is difficult.
- Remote Areas: Some inundation zones are in remote areas with limited communication coverage and difficult access for emergency responders.
- Limited Evacuation Routes: Some inundation zones (narrow canyons) have limited evacuation routes that may be cut off by flood waters.



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- **Rapid Onset:** Dam failure flood waves move quickly, particularly in steep canyons, leaving little reaction time.
- **Skepticism and Complacency:** If false alarms occur or if no dam problems have been experienced historically, public response to warnings may be inadequate.

Dam failure creates multiple secondary and cascading hazards:

- **Debris Flow:** Flood wave carries debris (trees, destroyed structures, vehicles, sediment, boulders), creating additional destructive force beyond water alone.
- **Secondary Flooding:** Downstream dams or reservoirs may be overtopped by flood wave from upstream dam failure, potentially causing cascading failures.
- **Infrastructure Isolation:** Destroyed highways and bridges isolate communities, complicating emergency response and long-term recovery.
- **Utility Failures:** Damaged electrical, water, wastewater, and communication systems affect areas beyond inundation zone.
- **Environmental Contamination:** Flood wave can mobilize hazardous materials, petroleum products, septic waste, and agricultural chemicals.
- **Sedimentation and Erosion:** Massive sediment deposits downstream alter landscapes, bury agricultural lands, impact aquatic ecosystems, and require extensive cleanup.
- **Loss of Water Supply:** Failed dam eliminates water storage capacity, disrupting municipal supply, irrigation, hydroelectric power, or recreation.
- **Economic Collapse:** Communities dependent on recreation or agriculture in affected areas face economic devastation.
- **Psychological Trauma:** Survivors experience long-term psychological impacts from disaster.
- **Long-Term Land Use Changes:** Inundation zones may be deemed unsuitable for redevelopment, forcing relocation.

Dam failure risk is compounded by interaction with other hazards:

- **Dam Failure and Wildfire:** Post-wildfire conditions increase runoff and erosion, potentially causing dam sedimentation or increasing inflow floods. Burned areas downstream experience more severe erosion from dam failure flood.
- **Dam Failure and Earthquake:** Seismic events can trigger dam failures that occur simultaneously with other earthquake impacts (landslides, structure collapse), overwhelming emergency response.
- **Dam Failure and Extreme Precipitation:** The triggering flood event causing dam overtopping also creates widespread flooding beyond inundation zone, complicating response.
- **Dam Failure and Winter Conditions:** Dam failure during winter complicates evacuation, response, and recovery due to snow, ice, and cold.
- **Dam Failure and Drought:** While drought reduces failure probability (lower reservoir levels), it makes water supply consequences more severe and affects recovery resources.



Lifelines

Dam failure impacts all seven FEMA community lifelines:

Table 156. Lifelines

Core Capability / Lifeline	Impact Description	Key Consequences
Safety and Security	Catastrophic threat to life safety due to flooding, debris impact, and collapse forces. Search and rescue operations conducted in hazardous post-failure conditions. Law enforcement required for evacuated zone security.	- Potential for fatalities and severe injuries.- Difficult rescue conditions due to debris and water flow.- Extended law enforcement operations in evacuated or destroyed areas.
Food, Water, Shelter	Destruction of homes and displacement of residents requiring emergency shelter. Water systems disrupted or destroyed. Agricultural lands inundated. Food supplies contaminated by floodwaters.	- Emergency sheltering and feeding operations required.- Water contamination leading to boil orders or emergency distribution.- Crop and livestock losses reducing local food availability.
Health and Medical	Large-scale casualty incident overwhelms limited county medical resources. Contaminated water creates secondary disease risk. Psychological impacts widespread.	- Surge in injuries requiring regional assistance.- Potential disease outbreaks (e.g., waterborne illness).- Behavioral health services required for affected population.
Energy	Electrical and fuel infrastructure within inundation zones damaged or destroyed. Hydroelectric generation possibly lost. Power outages spread regionally.	- Long-term outages in affected areas.- Disruption of fuel delivery and generator operations.- Limited power availability for shelters and EOCs.
Communications	Cell towers, fiber lines, and radio repeaters damaged or lose power. Public warning and emergency coordination disrupted.	- Emergency alerts delayed or missed.- Loss of situational awareness.- Public confusion and misinformation risk.
Transportation	Major highways and bridges (U.S. 24, CO 67) destroyed or blocked. County roads and evacuation routes impassable due to flooding or debris.	- Communities isolated for extended periods.- Emergency access delayed or impossible.- Significant economic and logistical disruptions.
Hazardous Materials	Floodwaters mobilize stored fuels, agricultural chemicals, and waste systems. Septic and industrial	- Long-term environmental contamination.- Public health risks from exposure and



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Core Capability / Lifeline	Impact Description	Key Consequences
	releases contaminate floodplain and water supply.	ingestion.- Costly cleanup and mitigation required.

Dam failure hazards are interconnected with multiple other hazards in Park County:

- Dam Failure and Flooding: Dam failure IS a flooding hazard, and the triggering event (extreme precipitation) typically causes other flooding beyond the dam inundation zone.
- Dam Failure and Earthquake: Seismic events can trigger dam failures, creating compounded disaster.
- Dam Failure and Wildfire: Post-fire hydrology affects dam inflows and sediment loads; dam failure floods affect burn scar areas.
- Dam Failure and Infrastructure Failure: Dam failure causes cascading infrastructure failures (roads, bridges, utilities) that compound response challenges.
- Dam Failure and Drought: Water supply consequences of dam failure are magnified during drought periods.

Recent and Future Development

Development trends in Park County affect dam failure vulnerability. Increasing Inundation Zone Development: Continued development in downstream areas increases exposure:

- Residential growth in Lake George area (downstream of Eleven Mile Canyon Dam)
- Recreation development in canyon areas
- Highway corridor development
- New structures and population in previously undeveloped inundation zones

Development in Lake George area has been substantial in recent years, significantly increasing downstream exposure to Eleven Mile Canyon Dam failure. This development increases consequences of failure and increases the dam's hazard classification scrutiny.

Aging Dam Infrastructure: Existing dams continue to age, potentially increasing structural failure probability without adequate maintenance investment.

Dam Safety Improvements: Some dams have undergone upgrades and improvements:

- Spillway modifications to increase capacity
- Instrumentation installations
- Emergency Action Plan updates
- Structural repairs and rehabilitation

New Dam Construction: Some new small dams have been constructed for water storage, irrigation, and recreation. Modern construction standards reduce failure risk, but any new dam increases overall county exposure.



Mitigation Opportunities: Development trends create opportunities for dam failure mitigation:

- Land use planning can discourage high-value development in inundation zones
- Building codes can require elevated construction or flood-resistant design in inundation areas
- Emergency Action Plan exercises can improve preparedness
- Public education can inform downstream residents of risks
- Warning systems can be enhanced
- Evacuation planning can be refined

Changes in Vulnerability

Since the previous HMP update, the planning area's dam failure vulnerability has changed:

- Increased Development: Population and development growth in Lake George and other inundation zone areas has increased exposure. Estimated 15-20% increase in structures in some inundation zones.
- Aging Infrastructure: Existing dams are now 5+ years older, potentially increasing structural risk without offsetting improvements.
- Enhanced Dam Safety Program: Colorado's Dam Safety Branch has enhanced inspection and oversight, potentially reducing structural failure probability for regulated dams.
- Improved Emergency Action Plans: Updates to EAPs for high hazard dams have improved preparedness, potentially reducing consequences if failure conditions develop.
- Climate Awareness: Growing understanding of climate variability and extreme hydrologic events has elevated awareness of overtopping risk.
- Recreation Growth: Increased recreation activity in canyon areas and along rivers increases population exposure, particularly during peak season.

Overall Assessment: the planning area's dam failure vulnerability has increased since the last plan update due to development growth in inundation zones and aging dam infrastructure. This increased vulnerability has been partially offset by improved dam safety oversight and emergency planning. The net result is a moderate increase in overall risk, with particular concern for continued development in the Lake George area downstream of Eleven Mile Canyon Dam. The most critical vulnerability remains the concentration of population and critical infrastructure (Highway 24) in inundation zones of high hazard dams, combined with limited warning time available for evacuation if catastrophic failure occurs.



Consequence Analysis

Table 157. Dam Failure Consequence Analysis

Consideration	Description
Public	Dam failure poses an extreme threat to life safety through catastrophic downstream flooding, debris flows, and high-velocity water impacts. Fatalities and injuries are likely, especially if failure occurs at night or without warning. Residents, recreationists, and travelers in inundation zones are at highest risk. Survivors face long-term psychological trauma and displacement from destroyed homes, with quality-of-life impacts lasting years during recovery.
Responders	Emergency responders face severe hazards including swift-water conditions, debris, and limited access to affected areas. Search and recovery operations are extremely dangerous. Regional mutual aid and state/federal support would be required. Responder fatigue and trauma are expected due to fatalities and prolonged operations.
Continuity of Operations (Government)	A major dam failure would overwhelm Park County's local government capacity. The EOC would require activation for weeks or months. Road and bridge destruction would prevent normal operations. Property and revenue losses would reduce the tax base. Federal and state disaster assistance would be essential to maintain solvency and support long-term recovery efforts.
Public Confidence in Government	Failure to issue timely warnings or coordinate evacuations would severely erode public trust. Transparent, effective communication and organized response are critical to maintain confidence. Controversies may arise over land use decisions, liability, and recovery priorities. Public expectations for government aid may exceed available resources.
Property	All structures in inundation zones would be severely damaged or destroyed, particularly in high-velocity areas. Estimated 100–300+ buildings affected, with property losses between \$50M–\$150M+. Agricultural land would be buried under sediment; vehicles and personal property destroyed. Rebuilding may be restricted in high-risk areas due to ongoing flood hazards.
Facilities & Infrastructure	Critical highways (U.S. 24, CO 67) and 10–20+ bridges would be destroyed, cutting off access across the county. Utilities, water systems, and communication lines within inundation areas would be damaged or lost. Recreation and tourism infrastructure would be eliminated. Estimated repair/replacement costs: \$20M–\$50M+. Reconstruction would take years.
Environment	Severe, long-lasting environmental damage expected. Scouring and sediment deposition would permanently alter river channels and floodplains. Aquatic and riparian ecosystems destroyed, contamination from fuel, chemicals, and waste widespread. Fish and wildlife mortality high. Full ecological recovery may take decades.
Economic	Economic losses catastrophic: property and infrastructure damage (\$80M–\$250M), business interruption (\$10M–\$30M), agricultural losses, and tourism



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Consideration	Description
	collapse. Insurance and recovery costs would skyrocket. Property values in flood-prone zones would plummet. Population decline possible as displaced residents relocate. Full recovery could take 5–10+ years.

Multi-Jurisdictional Concerns

Dam failure hazards create multi-jurisdictional concerns due to the regional nature of consequences and the need for coordinated emergency response:

- **Upstream-Downstream Relationships:** Dam failures affect jurisdictions downstream of the dam, potentially crossing multiple county and municipal boundaries. Cheesman Dam (Park County) failure would impact areas well into Jefferson and Douglas Counties.
- **Interstate Implications:** South Platte River flows northeast from Park County through multiple counties and eventually into Nebraska. Extreme dam failure flooding could have downstream effects beyond Colorado.
- **State and Federal Roles:** Dam safety regulation is a state responsibility (Dam Safety Branch). Major dam failures require state and federal emergency response and recovery assistance. Army Corps of Engineers and other federal agencies provide technical expertise.
- **Regional Coordination:** Emergency Action Plans require coordination between dam owners, county emergency management, state agencies, and downstream jurisdictions. Exercises and training involve multiple agencies.
- **Mutual Aid Requirements:** Major dam failure would overwhelm local emergency response capacity, requiring substantial mutual aid from surrounding counties and state resources.

Table 158. Multi-Jurisdictional Dam Failure Assessment

Jurisdiction / Partner	Shared Dam Failure Concerns	Notable Vulnerabilities	2025 HMP Priorities
Park County (Unincorporated)	Countywide dam safety, emergency response, inundation zone development	Multiple dams within jurisdiction; development in Lake George area; Highway 24 crosses inundation zones; limited emergency response resources	Dam safety oversight; land use planning in inundation zones; emergency response planning; public education
Town of Fairplay	Regional coordination; limited direct inundation risk	No major dams immediately upstream; potential downstream impacts from South Park basin dams	Regional emergency planning; mutual aid agreements; emergency sheltering capacity



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Jurisdiction / Partner	Shared Dam Failure Concerns	Notable Vulnerabilities	2025 HMP Priorities
Town of Alma	Regional coordination; limited direct inundation risk	No major dams immediately upstream; potential exposure from small local dams	Regional emergency planning; mutual aid coordination
Platte Canyon Fire Protection District (FPD)	Dam failure response capability; small dams possible in district	Limited major dam threats; small private dams possible; swift-water rescue difficult	Swift-water rescue capability; emergency preparedness; mutual aid coordination
Lake George Fire Protection District (FPD)	Eleven Mile Canyon Dam downstream exposure	Lake George community in inundation zone; Highway 24 critical for evacuation; recreation areas at risk	Emergency Action Plan participation; evacuation planning; public education; swift-water rescue training; early warning systems
North-West Fire Protection District (FPD)	Small private dams; limited major threats	Presence of small private dams; generally lower population density	Dam safety awareness; mutual aid agreements; basic emergency preparedness
South Park Ambulance District	Emergency medical response and evacuation during dam failure	Ambulance transport in inundation zones dangerous; potential surge of casualties; limited access if bridges fail	Emergency Action Plan participation; evacuation and mass-casualty planning; mutual aid coordination
Hartsel Fire Protection District (FPD)	Downstream exposure to Antero Dam	Moderate exposure to Antero Dam failure; rural population; Highway 24 corridor risk	Emergency Action Plan coordination; evacuation procedures; responder preparedness
Jefferson Fire Protection District (FPD)	Small private dams; regional coordination	Small dams in district; low overall risk; rural character	Dam safety awareness; emergency preparedness; mutual aid support
Southern Park County Fire Protection District (FPD)	Small private dams; remote response challenges	Remote service areas with limited access; small dams possible	Dam safety awareness; mutual aid coordination; regional preparedness
Colorado Dam Safety Branch (State of Colorado)	Statewide dam safety regulation and oversight	Responsible for inspection and regulatory compliance of all state-registered dams	Dam inspections and enforcement; Emergency Action Plan verification; technical



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Jurisdiction / Partner	Shared Dam Failure Concerns	Notable Vulnerabilities	2025 HMP Priorities
			assistance to owners and local jurisdictions
Denver Water	Major dam owner/operator (Eleven Mile Canyon, Cheesman, Antero)	Operates high-hazard dams; accountable for safety, maintenance, and Emergency Action Plans	Ongoing dam maintenance and monitoring; emergency coordination with Park County; public awareness programs
Colorado Parks and Wildlife (CPW)	Dam owner/operator (Spinney Mountain, Jefferson Lake)	Operates significant hazard dams; manages public recreation in inundation zones	Dam safety and monitoring; Emergency Action Plans; recreation area warning and closure systems; interagency coordination
Jefferson County	Downstream of Cheesman Dam	Portions of county exposed to Cheesman Dam inundation	Regional coordination; Emergency Action Plan participation; mutual aid support
Douglas County	Downstream of Cheesman Dam	Portions of county within Cheesman Dam inundation zone	Regional coordination; Emergency Action Plan participation; mutual aid engagement

Hazard Summary

Table 159. Dam Failure Hazard Summary

Dam / Inundation Zone	Population Exposed	Structures Exposed	Critical Infrastructure Exposed	Estimated Value at Risk	Risk Category	Key Vulnerabilities / Notes
Eleven Mile Canyon Dam / Eleven Mile Reservoir	1,000–2,000+ residents plus recreationists/travelers	300–500+ structures	Highway 24; 10–15 bridges; utilities; recreation facilities	\$60M–\$150M	High Hazard; Low Probability; Catastrophic Consequence	Lake George community in inundation zone; Eleven Mile Canyon recreation; Highway 24 critical corridor; limited



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Dam / Inundation Zone	Population Exposed	Structures Exposed	Critical Infrastructure Exposed	Estimated Value at Risk	Risk Category	Key Vulnerabilities / Notes
						warning time in canyon
Cheesman Dam (Park County portion)	200–500 in Park County portion	50–100+ structures	Highway 67; bridges; utilities; recreation areas	\$10M–\$30M (Park County portion)	High Hazard; Very Low Probability; Catastrophic Consequence	Well-maintained historic dam; extends into Jefferson/Douglas Counties; South Platte Canyon recreation
Antero Reservoir Dam	50–150	20–50+ structures	Highway 24; bridges; agricultural infrastructure	\$8M–\$25M	Significant to High Hazard; Very Low Probability; Significant Consequence	South Park basin location; Denver Water facility; moderate downstream development
Spinney Mountain Dam	20–50	5–15 structures	Highway 24 crossings; agricultural areas	\$2M–\$8M	Significant Hazard; Very Low Probability; Moderate Consequence	Colorado Parks & Wildlife facility; limited residential development downstream
Small Private Dams (Countywide)	Varies; typically, 0–50 per dam	Varies; typically, 0–20 per dam	County roads; utilities; agricultural infrastructure	Varies; typically, \$200K–\$2M per dam	Low to Significant Hazard; Low Probability; Localized Consequence	Numerous small dams; varying condition; some higher failure probability; generally limited consequences



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Table 160. Quantitative Dam Failure Risk Summary

Exposure Metric	2025 Estimate	Change Since 2020
Total Jurisdictional Dams in County	15–25	Stable to slightly increasing
High Hazard Dams	2–4 (includes Eleven Mile Canyon, Cheesman, possibly others)	Stable
Significant Hazard Dams	3–6	Stable
Population in Inundation Zones (Total)	1,500–3,000+	+15–20%
Structures in Inundation Zones (Total)	400–700+	+15–20%
Property Value in Inundation Zones	\$80M–\$220M+	+20–25%
Annual Probability of Major Dam Failure	<0.5% (<1 in 200 years)	Stable
Annual Probability of Small Dam Failure	1–3%	Stable
Dams with Emergency Action Plans	All high and significant hazard dams	Improved/updated
Public Awareness of Dam Failure Risk	Low to Moderate (improving with education)	Slightly improved
Warning Time Available (Catastrophic Failure)	5 minutes to 2 hours depending on location	Stable (limited by physics)
Warning Time Available (Slow Failure)	Hours to days	Improved with monitoring systems
Evacuation Route Adequacy	Limited in canyon areas; adequate in broader valleys	Stable
Emergency Response Capacity	Overwhelmed by major failure; requires regional/state assistance	Slightly improved planning



Inventory of Assets

The identification of critical assets is a fundamental component of the Park County HMP. Critical assets, including essential infrastructure, emergency services, utilities, and key community resources, are integral to the functioning and resilience of the county during and after a disaster. By identifying these assets, the plan ensures that the county can prioritize protection measures, allocate resources effectively, and reduce the risk of significant disruptions in the event of natural or human-caused hazards.

Critical assets, such as hospitals, emergency response facilities, water supply systems, power infrastructure, and transportation networks, are essential for maintaining public safety, health, and economic stability. Protecting these assets minimizes the overall impact of hazards, ensures continuity of services, and enhances the county's ability to recover quickly from disasters. Additionally, identifying and assessing the vulnerability of these assets enables the planning area to develop targeted mitigation strategies that strengthen resilience and reduce potential losses, further safeguarding the community's well-being.

Critical Facility Inventory

A list of critical facilities developed by the County and its planning partners included geospatial data for fire, police, schools, medical facilities, etc. On completion of the analysis, each planning partner was provided the critical facilities list, on which impact from each hazard is identified for each critical facility. That data was then utilized by each planning partner to determine dollar impact (e.g., magnitude and severity within the Calculated Priority Risk Index discussed below). The critical facilities list is considered privileged from public disclosure; however, each planning partner was left to determine how they wished to identify specific structures based on their policies in place. In addition, specific critical facility structure impact data is further identified within the various Critical Facilities tables contained in each hazard profile, identified by critical facility type, e.g., power, water, wastewater, etc.

Building impact was further identified in Loss Matrix Tables, which provide the breakdown to each of the jurisdictional planning partners for use in completing their risk assessment. That data further identifies the number of structures impacted and the population impacted (where possible) based on the specific hazard of concern. As appropriate, that data is also identified within the various public outreach documents and posters developed for the public outreach efforts. It should be noted that with all data, the critical facilities list is continually in an update process and should not be considered to be all-encompassing.

Add Map

Figure 46. Critical Facilities and Systems



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Table 161. Critical Facilities and Systems

Facility Name	Location (Street Address)	Facility Type	Associated Hazards
Park County EOC	911 Clark Street PO Box 1373 Fairplay, CO 80440	Emergency Operations Center (EOC)	All hazards
North-West FD Station 1	55 W Buckskin Rd Alma, CO 80420	Fire Station	Wildfire, Winter Storm, Earthquake
NW Fire Protection HQ – Station 2	21455 US Hwy 285, Fairplay CO 80440	Fire Station	Wildfire, Winter Storm, Earthquake
Platte Canyon High School	57243 Hwy 285, Bailey CO 80421	School	All Hazards
Platte Canyon Fairgrounds	880 Bogue St, Fairplay CO 80440	Staging/Shelter	All Hazards
Platte Canyon FPD Station 1	60298 US Hwy 285, Bailey, CO 80421	Fire Station	Wildfire, Winter Storm, Earthquake
Platte Canyon FPD Station 2	153 Delwood Dr, Bailey, CO 80421	Fire Station	Wildfire, Winter Storm, Earthquake
Platte Canyon FPD Station 3	49798 US Hwy 285, Grant, CO 80448	Fire Station	Wildfire, Winter Storm, Earthquake
Platte Canyon FPD Station 4	157 Neal Rd, Bailey, CO 80421	Fire Station	Wildfire, Winter Storm, Earthquake
Park County Sheriff's Office	1180 County Road 16, Fairplay, CO 80440	Law Enforcement Facility	Wildfire
Park County Animal Hospital	1161 Bullet Road, Fairplay, CO, 80440	Medical (Animal)	Wildfire, Winter Storm
South Park High School	640 Hathaway St, Fairplay, CO 80440	School (K–12)	Flood, Winter Storm, Wildfire
South Park Health Service District	525 Hathaway St, Fairplay, CO 80440	Medical Clinic	Pandemic, Winter Storm
IREA/Xcel Substation	136 County Rd 12 Alma, CO 80420 / 33611 Hwy 9 Hartsel, CO 80449 / 54401 Hwy	Electric Utility Infrastructure	High Wind, Wildfire, Power Outage



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards
	9 Alma, CO 80420 / 1225 County Rd 64 Bailey, CO 80421		
Fairplay Municipal Water Facility	Not Public	Water Treatment Facility	Flood, Earthquake, Drought
Rural septic systems	Not Public/ Various Rural Subdivisions	Wastewater Facilities	Flood, Drought, Earthquake
U.S. Hwy 285 Bridge	U.S. Highway 285, multiple locations	Bridge / Critical Road Segment	Flood, Earthquake, Wildfire
County Road 77 Bridge	County Rd 77, Park County	Bridge / Critical Road Segment	Flood, Earthquake, Wildfire
Park County 911 Dispatch	485 Hathaway St, Fairplay, CO 80440	Communication / Dispatch Center	High Wind, Lightning, Winter Storm
Rural Communication Towers	Not Public/ Multiple Rural Locations	Communication Towers	High Wind, Lightning, Winter Storm
Propane Distribution	415 County Rd 64A Bailey, CO 80421 / 581 Hwy 285 Fairplay, CO 80440 / 902 Main St Fairplay, CO 80440 / 60786 Hwy 285 Bailey, CO 80421 / 45000 Hwy 9 Fairplay, CO 80440 / 67302 Hwy 285 Pine, CO 80470	Tier II Hazmat Site	HazMat Release, Wildfire
Local Irrigation Dams (unnamed)	Multiple sites	Dams (non-high risk)	Flood, Earthquake
Water System – Fairplay	Fairplay	Water Infrastructure	Wildfire, Flood
Fairplay Community Center	880 Bogue St, Fairplay, CO 80440	Public Shelter	Severe Weather, Wildfire
Town Hall	856 Castello, Fairplay, CO, 80440	Government Facility	Wildfire, Flood, Winter Storm



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards
Jefferson-COMO Fire Station 1	50 CR35 Jefferson, CO 80456	Fire Station	All Hazards
Jefferson-COMO Fire Station 2	100 Rowe St, Como CO 80432	Fire Station	All Hazards
Jefferson-COMO Fire Station 3	493 Stage Stop Rd, Jefferson, CO 80432	Fire Station	All Hazards
Jefferson-COMO Fire Station 4	441 Duray Trail, Como CO 80432	Fire Station	All Hazards
Jefferson-COMO Fire Station 5	20200 CR 15, Como CO 80432	Fire Station	All Hazards
Jefferson-COMO Fire Station 6	963 Al Gulch Rd, Jefferson CO 80432	Fire Station	All Hazards
Jefferson-COMO Fire Station 7	511 Apache Trail, Como CO 80432	Fire Station	All Hazards
Park County PD	1180 Co Rd 16, Fairplay, CO 80440	Police Department	All Hazards
Indian Mountain Community Center	31 Rene CT, Jefferson CO 80456	Shelter	All Hazards
Lake George Propane Store	39041 US Hwy 24, Lake George, CO 80827-9706	Commercial	Hazardous Materials
Tesla Battery	Not Yet Published	Commercial	Hazardous Materials
Bridge	Mile Marker 265, Hwy 24, Lake George, CO 80827	Bridge/Critical Road	Flood Wildfire
Lake George Charter School	38874 US-24, Lake George, CO 80827	School	Wildfire, Winter Storm, Flooding
Guffey Charter School	1459 Main St, Guffey, CO 80820	School	Wildfire, Winter Storm, Flooding
Lake George Charter School	38874 Hwy 24, Lake George CO 80827	School	Wildfire, Winter Storm, Flooding
Cell Tower	140 Trail Creek Road, Lake George CO 80827	Communications	Wildfire, Windstorms
Cell Tower	6016 CR 192, Lake George CO 80827	Communications	Wildfire, Windstorms



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards
Cell Tower (Multiple)	Badger Mountain, Mile Marker 259 Hwy 24	Communications	Wildfire, Windstorms
Core Electric Sub-State	34801 CR 77, Lake George CO 80827	Utility	Wildfire, Wind, Winter Storm
Landis Bridge	33650 CR 77, Lake George CO 80827	Critical Subdivision Road	Wildfire, Flood
Denver Water, 11 Mile Dam	9200 CR 96, Lake George CO 80827	Water Utility	Wildfire, Earthquake, Flood
Colorado Springwater Pipeline	Throughout the County	Water Utility	Earthquake
Ferrell Gas	39041 Hwy 21, Lake George 80827	Commercial (Propane Storage)	Hazardous Materials, Wildfire
Lake George FD #1	8951 CR 90, Lake George CO 80827	Fire Station	Wildfire, Flood, Dam Failure
Lake George FD #2	7000 CR 98, Lake George CO 80827	Fire Station	Wildfire
Lake George FD #3	6160 CR 92 Lake George CO 80827	Fire Station	Wildfire
Lake George FD #4	29468 CR 77, Lake George CO 80827	Fire Station	Wildfire
Lake George FD #5	523 Pulver Rd, Lake George CO 80827	Fire Station	Wildfire
Wastewater System	Not Public, Fairplay	Water Infrastructure	Wildfire, Flood
Wastewater Treatment Plant	Not Public, Fairplay	Wastewater Treatment	Flood, Winter Storm
Alma Water Plant	Alma (within town limits) Not Public	Water Treatment Facility	Flood, Severe Winter Weather
Alma Wastewater System	Alma (within town limits) Not Public	Wastewater System	Flood
Alma Police Department	59 Buckskin St, Alma, CO 80420	Law Enforcement Facility	Wildfire, Civil Disturbance
South Park Ambulance District	310 Hathaway St, Fairplay, CO 80440	EMS / Medical	All hazards



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards
Substation	35529 County Rd 77 Lake George, CO 80827	Substation	All hazards
Substation	63566 Hwy 285 Bailey, CO 80421	Substation	All hazards
Substation	48780 Hwy 285 Grant, CO 80448	Substation	All hazards

Values at Risk

The Values at Risk outlined above will be incorporated into the vulnerability assessment for each identified hazard in this HMP. This assessment will evaluate how hazards impact people, property, infrastructure, the economy, and the environment, identifying the most at-risk assets and populations. By analyzing these factors for each hazard, the plan will provide a comprehensive understanding of community vulnerabilities, helping prioritize mitigation strategies to reduce risks and enhance resilience. Special consideration will be given to critical facilities, vulnerable populations, and essential services to ensure that preparedness and response efforts effectively address Park County's specific needs.

Estimating Potential Loss

The planning area may experience losses from a variety of hazards, including wildfire, severe winter weather, flooding, and hazardous materials incidents. These losses could range from minor operational disruptions to catastrophic destruction of residential, commercial, and public infrastructure. In addition to the threat of loss of life and structural damage, the County could face substantial legal and financial liability from impacted residents, businesses, and critical service providers.

Business interruption, particularly in the tourism, construction, and public services sectors, could exponentially increase total loss exposure. A significant event—such as a fast-moving wildfire through a developed wildland-urban interface or widespread flooding impacting transportation and utilities—could result in cascading disruptions across multiple sectors.

Based on asset inventories and general exposure modeling, it is estimated that a catastrophic loss event affecting major facilities, critical infrastructure, and commercial activity could result in damages exceeding \$150 million, including direct structural losses, indirect economic impacts, and emergency response costs.



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Table 162. Critical Facilities and Systems Assessment

Facility Name	Location (Street Address)	Facility Type	Associated Hazards	Estimated Replacement Value (\$)
Park County EOC	911 Clark Street, Fairplay, Colorado 80440	Emergency Operations Center (EOC)	All hazards	2,500,000
North-West FD Station 1	51 Buckskin St, Alma CO 80420	Fire Station	Wildfire, Winter Storm, Earthquake	1,500,000
NW Fire Protection HQ – Station 2	21455 Highway 285, Fairplay, Colorado 80440	Fire Station	Wildfire, Winter Storm, Earthquake	1,500,000
Platte Canyon High School	57243 Hwy 285, Bailey CO 80421	School	All Hazards	3,000,000
Platte Canyon Fairgrounds	880 Bogue St, Fairplay CO 80440	Staging/Shelter	All Hazards	2,500,000
Platte Canyon FPD Station 1	60298 US Hwy 285, Bailey, CO 80421	Fire Station	Wildfire, Winter Storm, Earthquake	1,500,000
Platte Canyon FPD Station 2	153 Delwood Dr, Bailey, CO 80421	Fire Station	Wildfire, Winter Storm, Earthquake	1,500,000
Platte Canyon FPD Station 3	49798 US Hwy 285, Grant, CO 80448	Fire Station	Wildfire, Winter Storm, Earthquake	1,500,000
Platte Canyon FPD Station 4	157 Neal Rd, Bailey, CO 80421	Fire Station	Wildfire, Winter Storm, Earthquake	1,500,000
Park County Sheriff's Office	1180 County Rd 16, Fairplay, CO 80440	Law Enforcement Facility	Wildfire, Civil Disturbance	2,000,000
Park County Animal Hospital	1161 Bullet Road, Fairplay, CO, 80440	Medical (Animal)	Wildfire, Winter Storm	500,000
South Park High School	640 Hathaway St, Fairplay, CO 80440	School (K–12)	Flood, Winter Storm, Wildfire	10,000,000
IREA/Xcel Substation	Not Public	Electric Utility Infrastructure	High Wind, Wildfire, Power Outage	4,000,000
Fairplay Municipal Water Facility	Not Public	Water Treatment Facility	Flood, Earthquake, Drought	3,000,000
Rural septic systems	Not Public	Wastewater Facilities	Flood, Drought, Earthquake	2,000,000



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards	Estimated Replacement Value (\$)
South Park Health Service District	525 Hathaway St, Fairplay, CO 80440	Medical Clinic	Pandemic, Winter Storm	3,500,000
Park County Jail	1180 County Rd 16, Fairplay, CO 80440	Jail / Detention	Wildfire, Earth Movement, Winter Weather	5,900,000
U.S. Hwy 285 Bridge	Hwy 285, multiple locations	Bridge / Critical Road Segment	Flood, Earthquake, Wildfire	5,000,000
County Road 77 Bridge	County Rd 77, Park County	Bridge / Critical Road Segment	Flood, Earthquake, Wildfire	5,000,000
Park County 911 Dispatch	485 Hathaway St, Fairplay, CO 80440	Communication / Dispatch Center	High Wind, Lightning, Winter Storm	1,200,000
Rural Communication Towers	Multiple rural locations	Communication Towers	High Wind, Lightning, Winter Storm	1,200,000
Propane Distribution	60786 US Hwy 285, Bailey, CO 80421	Tier II Hazmat Site	HazMat Release, Wildfire	1,500,000
Local Irrigation Dams (unnamed)	Multiple sites	Dams (non-high risk)	Flood, Earthquake	1,000,000
Fairplay Community Center	880 Bogue St, Fairplay, CO 80440	Public Shelter	Severe Weather, Wildfire	800,000
Town Hall – Fairplay	856 Castello, Fairplay, Colorado, 80440	Government Facility	Wildfire, Flood, Winter Storm	1,100,000
Jefferson-COMO Fire Station 1	50 CR35 Jefferson, CO 80456	Fire Station	All Hazards	1,500,000
Jefferson-COMO Fire Station 2	100 Rowe St, Como CO 80432	Fire Station	All Hazards	1,500,000
Jefferson-COMO Fire Station 3	493 Stage Stop Rd, Jefferson, CO 80432	Fire Station	All Hazards	1,500,000
Jefferson-COMO Fire Station 4	441 Duray Trail, Como CO 80432	Fire Station	All Hazards	1,500,000
Jefferson-COMO Fire Station 5	20200 CR 15, Como CO 80432	Fire Station	All Hazards	1,500,000



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards	Estimated Replacement Value (\$)
Jefferson-COMO Fire Station 6	963 Al Gulch Rd, Jefferson CO 80432	Fire Station	All Hazards	1,500,000
Jefferson-COMO Fire Station 7	511 Apache Trail, Como CO 80432	Fire Station	All Hazards	1,500,000
Park County PD	1180 Co Rd 16, Fairplay, CO 80440	Police Department	All Hazards	1,000,000
Indian Mountain Community Center	31 Rene CT, Jefferson CO 80456	Shelter	All Hazards	500,000
Lake George Propane Store	39041 US Hwy 24. Lake George, CO 80827-9706	Commercial	Hazardous Materials	500,000
Tesla Battery	Not Yet Published	Commercial	Hazardous Materials	TBD
Bridge	Mile Marker 265, Hwy 24, Lake George, CO 80827	Bridge/Critical Road	Flood Wildfire	500,000
Lake George Charter School	38874 US-24, Lake George, CO 80827	School	Wildfire, Winter Storm, Flooding	1,500,000
Guffey Charter School	1459 Main St, Guffey, CO 80820	School	Wildfire, Winter Storm, Flooding	1,500,000
Cell Tower	140 Trail Creek Road, Lake George CO 80827	Communications	Wildfire, Windstorms	500,000
Cell Tower	6016 CR 192, Lake George CO 80827	Communications	Wildfire, Windstorms	500,000
Cell Tower (Multiple)	Badger Mountain, Mile Marker 259 Hwy 24	Communications	Wildfire, Windstorms	500,000
Core Electric Sub- State	34801 CR 77, Lake George CO 80827	Utility	Wildfire, Wind, Winter Storm	500,000,000
Landis Bridge	33650 CR 77, Lake George CO 80827	Critical Subdivision Road	Wildfire, Flood	500,000



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Facility Name	Location (Street Address)	Facility Type	Associated Hazards	Estimated Replacement Value (\$)
Denver Water, 11 Mile Dam	9200 CR 96, Lake George CO 80827	Water Utility	Wildfire, Earthquake, Flood	Not Disclosed
Colorado Springwater Pipeline	Throughout the County	Water Utility	Earthquake	Not Disclosed
Ferrell Gas	39041 Hwy 21, Lake George 80827	Commercial (Propane Storage)	Hazardous Materials, Wildfire	500,000
Lake George FD #1	8951 CR 90, Lake George CO 80827	Fire Station	Wildfire, Flood, Dam Failure	1,500,000
Lake George FD #2	7000 CR 98, Lake George CO 80827	Fire Station	Wildfire	1,500,000
Lake George FD #3	6160 CR 92 Lake George CO 80827	Fire Station	Wildfire	1,500,000
Lake George FD #4	29468 CR 77, Lake George CO 80827	Fire Station	Wildfire	1,500,000
Lake George FD #5	523 Pulver Rd, Lake George CO 80827	Fire Station	Wildfire	1,500,000
Water System – Fairplay	Fairplay	Water Infrastructure	Wildfire, Flood	6,900,000
Wastewater Treatment Plant – Fairplay	Fairplay	Wastewater Treatment	Flood, Winter Storm	7,700,000
Alma Water Plant	Alma (in town limits)	Water Treatment Facility	Flood, Severe Winter Weather	6,700,000
Alma Wastewater System	Alma	Wastewater System	Flood	2,300,000
Alma Police Department	59 Buckskin St, Alma, CO 80420	Law Enforcement Facility	Wildfire, Civil Disturbance	1,500,000
South Park Ambulance District-Headquarters	310 Hathaway St, Fairplay, CO 80440	EMS / Medical	All hazards	1,500,000



Chapter Three: Methodology

As defined by the Federal Emergency Management Agency (FEMA), risk represents the intersection of hazard, vulnerability, and exposure. FEMA's 2022 Local Mitigation Planning Policy Guide emphasizes that risk assessment is a dynamic and iterative process—evaluating not only the likelihood and severity of hazard events, but also the community's capacity to withstand, adapt to, and recover from those events.

This assessment combines quantitative data and qualitative analysis to characterize how hazards impact people, property, infrastructure, and critical services across the planning area, including all incorporated municipalities and special districts. The methodology ensures compliance with 44 CFR §201.6 and follows FEMA's four-step process for risk analysis:

Table 163. Assessment Process

Step	Description
1. Identify Hazards	Determine natural and human-caused hazards with potential to affect the planning area.
2. Profile Hazard Events	Analyze historical occurrences, spatial extent, frequency, severity, and potential future conditions or trends.
3. Inventory Assets	Identify populations, structures, infrastructure, critical facilities, and key resources exposed to each hazard.
4. Estimate Losses	Quantify potential impacts to people, property, and the economy through modeling, exposure data, and local experience.

This integrated, data-driven approach supports evidence-based mitigation planning, allowing jurisdictions to prioritize actions that reduce losses and enhance long-term resilience.

Vulnerability and Exposure Integration

Each hazard profile developed for this plan evaluates vulnerability (the susceptibility to harm) and exposure (the assets and populations at risk). Exposure was determined through GIS-based overlay analyses comparing hazard extents with parcel data, structure inventories, and critical facility datasets.

When quantitative data were unavailable, qualitative assessments were used—drawing on historical events, expert judgment, and field observations. These analyses account for how hazards affect:

- Populations – including age, health, income, and social vulnerability indicators
- Structures and Infrastructure – including building age, construction type, and redundancy
- Critical Facilities and Systems – essential to response and recovery
- Economic Assets and Livelihoods – particularly agriculture, tourism, and service sectors



Where relevant, each hazard's narrative includes population exposure tables, damage cost ranges, and geographically variable vulnerability zones (e.g., South Park basin hail corridor, Bailey-area lightning zone).

Calculated Priority Risk Index (CPRI)

For hazards lacking sufficient empirical data for quantitative modeling, the Calculated Priority Risk Index (CPRI) was applied to establish relative risk rankings. The CPRI uses a weighted, multi-factor scoring system that evaluates:

Table 164. CPR Scoring

Criteria	Description	Weighting
Probability	Likelihood of occurrence over time based on historical and projected frequency	40%
Magnitude/Severity	Expected strength of event and potential scale of human, structural, and economic impacts	25%
Geographic Extent and Location	Percent of area and assets potentially affected	20%
Warning Time / Speed of Onset	Lead time available before impacts occur	10%
Duration	Expected length of time the event persists or causes disruption	5%

The resulting CPRI scores classify hazards by relative threat:

Table 165. Risk Level

Risk Level	Description
Extremely Low	Minimal or no documented hazard history; negligible impacts expected.
Low	Infrequent, localized impacts with minimal cost or disruption.
Medium	Periodic, measurable impacts to life, property, or operations.
High	Widespread, recurring impacts with substantial recovery needs.
Extremely High	Catastrophic, countywide impacts with prolonged disruption.

Modeling and Analytical Tools

Where sufficient data exist, the following tools and datasets were applied:

- FEMA Hazus – Used for flood and earthquake loss estimation, integrating structure valuation and census-based exposure.
- NOAA Storm Events Database – For frequency, severity, and economic loss history.
- USGS & NRCS datasets – For landslide susceptibility, seismic, and hydrologic data.
- GIS Spatial Analysis – Used to intersect hazard boundaries with population and infrastructure layers to estimate exposure.



For hazards not suitable for Hazus modeling (e.g., dam failure, hail, lightning, drought), GIS-based exposure mapping and qualitative vulnerability analysis were employed using the best available data and SME input.

Equity and Future Conditions

Consistent with FEMA's equity and adaptation guidance, this plan incorporates social vulnerability and future conditions analysis to ensure mitigation measures protect all residents equitably. This includes:

- Identifying populations disproportionately affected by temperature extremes, energy insecurity, and infrastructure outages.
- Considering demographic trends, aging populations, and housing conditions that influence vulnerability.
- Integrating climate and weather variability projections (e.g., increased frequency of 85°F+ days, persistence of extreme cold events).

These analyses ensure that Park County's mitigation actions are inclusive, forward-looking, and adaptable to evolving risk conditions.

Limitations

All data and results represent the best available information as of 2025 and are intended for planning purposes only. Limitations may result from:

- Incomplete or outdated local inventory or damage data
- Simplified modeling assumptions
- Uncertain future climate conditions
- Differences between mapped hazard extents and real-world impacts

While the assessment captures relative risk accurately, loss estimates are approximate and should be used to inform prioritization, not emergency response thresholds.

Vulnerability Assessment

Once the profiles identified above were completed, the following steps were used by each planning partner to define the risk of each hazard and develop the vulnerability assessment:

1. Determine exposure to each hazard—Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them would be exposed to each hazard.
1. Assess the vulnerability of exposed facilities—Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as GIS and Hazus (discussed below) were used in this assessment.



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2. Where specific quantitative assessments could not be completed, vulnerability was measured in general, qualitative term, summarizing the potential impact based on past occurrences spatial extent, and subjective damage and casualty potential. Those items were categorized utilizing the criteria established in the CPRI index.
3. The final step in the process was to determine the cumulative results of vulnerability based on the risk assessment and Calculated Priority Risk Index (discussed below) scoring, assigning a final qualitative assessment based on the following classifications:
 - Extremely Low—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
 - Low—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
 - Medium—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster. Occurrences are frequent, with more documented historic events.
 - High—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category have occurred in the past and have a high probability of reoccurring.
 - Extremely High—Very widespread with catastrophic impact. Hazards in this category may have occurred in the past and have a high probability for reoccurring.

The following table provides the overall vulnerability assessment for each hazard as profiled previously as the first step in development of the mitigation actions.

Table 166. Vulnerability Assessment

Hazard	Geographic Extent	Likelihood / Frequency	Severity / Impact	Community Vulnerability	Overall Assessment
Wildfire	Extensive (50–100%)	Highly Likely	Critical	High – widespread WUI exposure, power and communication disruptions, evacuation challenges	High
Severe Winter Weather	Extensive (50–100%)	Highly Likely	Critical	Moderate to High – remote access issues, heating reliance, elderly and low-income vulnerability	High
Flooding – Flash	Significant (10–50%)	Likely	Limited to Critical	Moderate – localized road, culvert, and	Medium



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Hazard	Geographic Extent	Likelihood / Frequency	Severity / Impact	Community Vulnerability	Overall Assessment
				drainage impacts; low-lying rural areas at risk	
Flooding – Riverine	Limited (≤10%)	Occasional	Limited	Low to Moderate – along Platte River and tributaries; limited structural exposure	Medium–Low
Drought	Extensive (50–100%)	Highly Likely	Critical	High – agricultural and water system dependence; ecosystem stress; economic ripple effects	High
Extreme Temperatures	Extensive (50–100%)	Highly Likely	Critical	High – elderly, outdoor workers, and low-income households at risk; infrastructure stress	High
High Winds	Extensive (50–100%)	Highly Likely	Limited to Critical	Moderate – power outages, property and tree damage; exposure throughout county	High
Hail	Significant (10–50%)	Highly Likely	Critical	High – highest frequency hazard; widespread structural and vehicle losses	High
Lightning	Extensive (50–100%)	Highly Likely	Limited to Critical	High – frequent ignition source for wildfires; outdoor exposure and infrastructure damage	High
Tornado	Limited (≤10%)	Occasional	Limited	Moderate – low frequency but could cause localized severe damage	Medium–Low
Landslide, Rockfall, Avalanche	Limited (≤10%)	Occasional	Limited	Low – primarily along steep terrain and mountain roads	Low
Earthquake / Seismic Activity	Limited (≤10%)	Unlikely	Limited	Low – low probability but potential for widespread secondary impacts	Low



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Hazard	Geographic Extent	Likelihood / Frequency	Severity / Impact	Community Vulnerability	Overall Assessment
Hazardous Materials Release	Significant (10–50%)	Likely	Limited to Critical	Moderate – transportation corridors and storage sites; rural response limitations	Medium
Pandemic / Biological Hazards	Extensive (50–100%)	Likely	Critical	High – healthcare capacity and workforce continuity challenges	High
Dam & Levee Failure	Limited (≤10%)	Unlikely to Occasional	Critical	Moderate – downstream property and life-safety risk near high-hazard dams	Medium

Capability Assessment

The planning area maintains a foundational network of emergency management and hazard mitigation capabilities that support preparedness, response, and recovery activities. The Office of Emergency Management serves as the lead coordinating agency for emergency planning, regularly engaging with local fire protection districts, law enforcement, public works, and EMS agencies. The County operates under a countywide Emergency Operations Plan (EOP), maintains mutual aid agreements with surrounding jurisdictions including El Paso, Teller, Lake, and Chaffee counties, and leverages systems such as CodeRED and IPAWS for public alert and warning. Park County also participates in regional exercises and engages in regular county leadership meetings to maintain interdepartmental awareness and coordination.

Despite its effective coordination mechanisms, the planning area's capability assessments have identified notable needs in areas such as staffing limitations, aging equipment, and backup power for critical facilities. Additional improvements are needed to expand specialized training in wildfire response, hazardous materials, and mass care operations. Enhancing public education, outreach to vulnerable populations, and informed mitigation strategies will be critical to sustaining the County's preparedness posture in the face of increasing hazard complexity and frequency.

Park County's Administrative/Technical Mitigation Capabilities

The planning area possesses essential administrative and technical capabilities that enable it to plan, implement, and enforce mitigation strategies. The OEM oversees emergency preparedness and disaster response, while the Planning and Zoning Department governs land use regulations to reduce risk exposure through code enforcement and subdivision review. Although the County does not have a formally named Local Emergency Planning Committee (LEPC), it conducts monthly leadership meetings that serve a similar coordination function.



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From a technical perspective, Park County benefits from GIS and mapping services that support hazard identification and public awareness. County personnel—including a Chief Building Official and GIS Coordinator—contribute to hazard risk reduction by integrating spatial data into planning and mitigation projects. The County utilizes CHAMP data and partners with the Central Colorado Emergency Preparedness Alliance (CEPA) to assess risk and coordinate efforts. However, capacity is constrained by limited full-time staff, and several critical roles such as a floodplain administrator or civil engineer are not currently filled.

Continued training, interdepartmental cooperation, and reliance on state and federal technical resources help compensate for these constraints. Strengthening local technical staffing and modernizing planning tools will improve the County's capacity to assess and reduce risk over time.

Table 167. Park County Administrative/Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Emergency Services Planning Council (ESPC)	Yes	Park County has an Emergency Services Planning Council with monthly county leadership meetings. The meetings are effective in keeping everyone informed of efforts within other departments. The Fire Districts are managed by boards, and they do plan in those meetings.
Mitigation Planning Committee	Yes	There is no committee with that particular name, but the ESPC functions in that capacity. The ESPC meets regularly and uses a composite of federal, state, county and non-governmental agencies to review all plans, exercises and incidents.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems) (County Roads)	Yes	Both Roads and Public Works have ongoing projects
Mutual aid agreements (State and Towns/Cities)	Yes	List: South Central Region (Elpaso, Teller, Chaffee, and Lake Counties) DFPC Fairplay Alma Platte Canyon has agreements with Jefferson County
Other		



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Administration	Y/N	Describe capability Is coordination effective?
Staff	Y/N FT/PT	Explain: Park County, as a small, rural County, can sometimes struggle with adequate staffing. The OEM has continuing efforts in training and exercises to keep the staff trained on hazards and needs for mitigation. Coordination between agencies and staff is generally effective, but there can be gaps when staffing changes.
Is staffing adequate to enforce regulations?	No	
Is staff trained on hazards and mitigation?	Yes	
Is coordination between agencies and staff effective?	Yes	
Chief Building Official	Yes	Brandon Heacock
Floodplain Administrator	Yes Yes	Jared McQueer is in the process of staff receiving their certification for the county Fairplay
Emergency Manager	Yes	Brad Golden
Community Planner	No	N/A
Civil Engineer	No	N/A
GIS Coordinator	Yes	Samuel Hasselbusch
Other	Yes	Lucas Meyer (County Manager)
Technical	Yes	Information Technology
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	Park County uses CodeRed and IPAWS for the county warning system. There are also various online pages where warnings and updates are posted
Hazard data and information/ Mapping	Yes	Park County GIS
Grant writing	Yes	Department Heads
Hazus (FEMA Risk Modeling) analysis	Yes	Park County partners with CEPA to identify gaps and risks
Other		
How can these capabilities be expanded and improved to reduce risk?		
Expand training, planning and drills for natural hazards and mitigation		



Administration	Y/N	Describe capability Is coordination effective?
- Enhance Warning and Notification Capabilities - Expand partnerships and MOU's - Expand floodplain management and overall planning for the County		

Park County's Fiscal Mitigation Capabilities

As a rural jurisdiction, the planning area relies on a combination of local revenues and external funding to support mitigation efforts. The County has access to capital improvement funds for infrastructure enhancements and possesses limited authority to levy taxes for emergency services and environmental conservation. Grant programs—including FEMA's HMGP and BRIC, and state-level programs such as VALE and DOLA grants—have historically supported mitigation initiatives, although recent reductions in federal funding (e.g., EMPG cuts) may impact future capacity.

Park County's budget supports projects such as road stabilization, snow removal, drainage improvements, and emergency facility upgrades. Matching requirements for federal grants are often met through strategic financial planning and resource prioritization. The County has also used ARPA funds and the Conservation Trust Fund for resilience projects. Long-term improvement of fiscal capabilities will require ongoing investment in grant writing capacity, strategic alignment with federal funding cycles, and sustainable local revenue mechanisms.

Table 168. Park County Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Roads, snow removal, building projects, all departments, ARPA, Conservation Trust Fund
Authority to levy taxes for specific purposes	Yes	STR taxes, 911 taxes, Land and Water Trust Fund
Fees for water, sewer, gas, or electric services	Yes	Out towns in the County manage these
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	County Government Buildings



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Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	Federal funds have been cut in Colorado in 2025
State funding programs	Yes	HMP, Veterans, VALE, City Readiness Initiative, WIC
Other	Y	EMPG (to be cut by September), Historic Preservation Grant, State Historic Preservation Grant, DOLA
How can these capabilities be expanded and improved to reduce risk?		
• Increase staff capacity for grant writing to improve access to BRIC, HMGP, and state programs through competitive applications. • Integrate mitigation into Capital Improvement Planning (CIP) to align infrastructure upgrades with hazard reduction goals. • Partner with regional or nonprofit organizations to pursue federal grants that require capacity or fiscal intermediaries (e.g., USDA, HUD).		

Mitigation Education, Outreach, and Partnerships

The planning area leverages strong public engagement and partnerships to bolster its mitigation capabilities. The Park County Office of Emergency Management (OEM) conducts public education through seasonal campaigns on wildfire preparedness, winter storms, and evacuation readiness. Fire protection districts engage residents in defensible space initiatives and hazard education, while nonprofit partners such as the Salvation Army and American Red Cross support preparedness fairs and training events.

The County participates in the National Flood Insurance Program (NFIP) and has received Firewise USA recognition for community-level wildfire risk reduction efforts. Additionally, Park County engages in regional collaborations with organizations such as Team Rubicon, RETAC, and the Coalition for the Upper South Platte to promote shared response resources and training. Despite these efforts, funding constraints have reduced the scale and reach of some education programs. Enhanced state and federal support would increase the reach of public outreach and improve risk awareness across communities.



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Table 169. Park County Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Park County utilizes the Salvation Army, the Red Cross and our historical preservation department. Our fire districts work with RETAC as well as train within their communities and districts. All of the fire districts have Boards that manage their departments.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	Park County Fire Districts are heavily involved in their districts and communities for preparation and education on hazards and threats
Natural disaster or safety related school programs	No	N/A
StormReady certification	No	N/A
Firewise Communities certification	Yes	
Public-private partnership initiatives addressing disaster-related issues	Yes	The fire districts have both public and private partnerships around disaster related issues
Other		
How can these capabilities be expanded and improved to reduce risk?		
- Expand natural disaster education in schools - Formalize and expand public-private partnerships, especially with utilities, agricultural producers, timber managers, and transportation providers. - Develop a county-wide public education strategy that connects existing programs and improves outreach consistency, especially to underserved populations.		

Other Mitigation Efforts

Park County implements a suite of ongoing mitigation efforts that reflect a whole-community approach to disaster resilience. Key activities include routine updates to the County's Emergency Operations Plan, annual multi-agency training exercises simulating wildfire, flood, and winter storm events, and infrastructure hardening projects such as culvert replacements and facility retrofits. The County has invested in emergency communications through CodeRED and IPAWS and maintains shelter and resource distribution plans for displaced residents.



Hazard mitigation is integrated into planning and zoning processes, with restrictions in flood-prone and high wildfire-risk areas. Collaborative fuel reduction projects, defensible space enforcement, and mechanical thinning are conducted with state and federal partners to reduce wildfire threats in the wildland-urban interface. The County also monitors weather change impacts and emerging threats such as invasive species and pandemics, adjusting mitigation strategies accordingly. These proactive efforts underscore Park County's commitment to long-term disaster risk reduction and community safety.

Assessment Analysis

The capability assessment of the planning area reveals a foundational yet resource-limited system for hazard mitigation and emergency preparedness. The County demonstrates strength in interagency coordination, mutual aid agreements, and utilization of modern warning systems like CodeRED and IPAWS. Administrative and technical capabilities—such as GIS support, land use oversight, and hazard mapping—are actively used to guide mitigation planning. However, gaps remain in staffing capacity, specialized technical roles, and consistent training across agencies. Fiscal resources are modest, with the County reliant on competitive state and federal grants to fund larger mitigation projects. Education and outreach efforts are robust in wildfire-prone areas but constrained by funding cuts at the federal level. Despite these limitations, Park County maximizes its capabilities through partnerships, public engagement, and strategic use of available tools and data. Strengthening internal staffing, securing sustainable funding streams, and expanding technical expertise will be essential to enhance long-term mitigation outcomes and resilience countywide.

Conclusion

The planning area's capability assessment highlights both strengths and areas for growth in its ongoing hazard mitigation efforts. While the planning area demonstrates strong leadership, interagency coordination, and a commitment to public safety through planning, education, and partnerships, limited staffing, funding constraints, and the need for more technical specialization present challenges. Continued investment in personnel development, infrastructure resilience, and strategic partnerships will be critical to addressing future risks, especially as hazards become more complex due to weather change and population growth. By building on its current foundation and leveraging state and federal resources, Park County is well positioned to enhance its preparedness, reduce vulnerability, and protect the well-being of its communities.



Chapter Four: Mitigation Strategy

Mitigation strategies for the planning area include specific goals, objectives, and actions to reduce the community's risk from identified hazards. These goals and objectives are designed to address the most significant risks and build resilience within the community.

Based on the results of the risk assessment, the Park County Hazard Mitigation Planning Committee (HMPC) developed a mitigation strategy for reducing the County's risk and vulnerability to hazards. The resulting Mitigation Strategy for the planning area is comprised of goals and objectives, along with a mitigation action plan which includes a series of mitigation action projects and implementation measures.

Goals and Objectives

Goal 1: Reduce Risk and Vulnerability to Life, Property, Economy, and Natural Systems from Park County's Most Significant Hazards

- Protect life, health, and safety for all residents, workers, and visitors, especially vulnerable and high-risk populations.
- Minimize losses to structures, infrastructure, and economic systems from wildfire, flooding, winter storms, drought, and hazardous materials events.
- Support sustainable development practices that avoid or reduce exposure to known hazard areas.
- Preserve and protect natural systems, including watersheds, forests, and open space that provide hazard mitigation benefits.

Goal 2: Protect Critical Facilities, Utilities, Infrastructure, and Lifelines to Maintain Community Functionality

- Retrofit or harden essential services such as roads, bridges, communications, and emergency facilities to withstand multi-hazard threats.
- Ensure facilities supporting continuity of government and emergency operations remain operational during and after hazard events.
- Improve energy and utility system reliability and redundancy to mitigate the impact of power outages or service disruptions.
- Address road access, evacuation bottlenecks, and high-risk transportation corridors in vulnerable areas.

Goal 3: Strengthen Public Education, Communication, and Engagement in Hazard Preparedness and Mitigation

- Deliver inclusive, accessible, and multilingual public outreach on local hazards, preparedness actions, and evacuation plans.
- Use multiple communication platforms, including in-person events, social media, reverse alerts, and mobile apps, to reach diverse audiences.



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- Educate residents, second homeowners, and visitors on Firewise practices, sheltering, flood insurance, and hazard-specific response protocols.
- Promote public participation in mitigation projects (e.g., defensible space, floodproofing, citizen preparedness) to increase local investment in resilience.

Goal 4: Enhance Interagency Coordination, Emergency Services Capacity, and Community Preparedness

- Improve coordination and training across fire, EMS, law enforcement, public health, and public works for all-hazards readiness.
- Expand emergency services capacity and staffing to meet the needs of a geographically dispersed and growing population.
- Increase responder awareness and tools for identifying and supporting vulnerable populations during disasters.
- Maintain and expand mutual aid agreements and shared resources with state, federal, and regional partners.
- Use after-action reviews and continuous improvement methods to enhance preparedness, response, and recovery efforts.

Goal 5: Sustain Mitigation Planning, Funding Eligibility, and Compliance with Federal and State Programs

- Maintain FEMA eligibility by updating the HMP every 5 years and tracking progress on mitigation actions.
- Increase participation in hazard planning by municipalities, districts, and stakeholder organizations.
- Continue participation in and compliance with the National Flood Insurance Program (NFIP); pursue Community Rating System (CRS) improvements where feasible.
- Leverage grant opportunities through FEMA (e.g., BRIC, HMGP), USDA, CDPHE, and DHSEM to fund priority mitigation projects.

Update to Goals and Objectives

The goals and objectives outlined in this updated HMP build on the foundational work of the previous plan while reflecting the planning area's evolving priorities, risk profile, and planning capacity. While earlier goals centered on broad themes such as life safety, property protection, and infrastructure resilience, the updated framework organizes these themes into more targeted, actionable categories aligned with FEMA's latest guidance. The revised goals now emphasize critical topics such as continuity of government operations, integration of weather-informed planning, protection of vulnerable populations, and the expanded use of modern communication technologies. Additionally, clear objectives have been included to support FEMA grant eligibility and long-term funding strategies. Goals specific to wildfire, public awareness, and interagency coordination have been elevated in response to the County's most pressing hazards. This refined structure ensures the plan remains relevant, implementable, and grounded in the realities facing Park County's communities, infrastructure, and environment.



Identification and Analysis of Mitigation Actions

The planning area conducted the Identification and Analysis of Mitigation Actions as part of its hazard mitigation planning process. This involved assessing potential risks, such as wildfires, floods, and seismic activity, and evaluating strategies to reduce their impact on communities. Officials analyzed historical data, environmental conditions, and infrastructure vulnerabilities to develop targeted solutions. Public input and collaboration with local agencies helped prioritize actions, ensuring resources were allocated effectively. The county also reviewed existing policies and integrated new mitigation measures to enhance resilience. This systematic approach allowed Park to create a comprehensive plan that addresses both immediate and long-term disaster preparedness.

Prioritization Process

Mitigation actions in this HMP were prioritized using a hybrid framework that integrates both traditional planning criteria and a modern, outcome-focused lens. This method ensures that the County and participating jurisdictions are addressing the most urgent risks while also maintaining compliance with FEMA requirements and long-term community resilience goals.

Evaluation Criteria

Each proposed mitigation action was reviewed and prioritized using the following factors:

Table 170. Evaluation Criteria

Criteria	Description
1. Life Safety and Public Health	Does the action reduce the risk of injury or loss of life?
2. Critical Infrastructure Protection	Does it protect essential services like utilities, schools, and emergency ops?
3. Support for Vulnerable Populations	Does it directly aid at-risk groups (elderly, disabled, low-income)?
4. Preparedness and Public Education	Does it increase public awareness and readiness for future hazard events?
5. Feasibility and Funding Potential	Is the action technically, legally, and administratively feasible?
6. Environmental or Cultural Benefits	Does the project align with environmental protection or historic preservation?
7. Cost-Effectiveness	Do the expected benefits outweigh implementation costs?



Prioritization Tiers

Actions are grouped into three priority levels based on cumulative scoring across the criteria above:

Table 171. Priority Levels

Priority	Definition
High	Actions that address life safety, critical services, or urgent vulnerabilities.
Medium	Actions that support awareness, preparedness, or address known risks.
Low	Administrative improvements or actions with longer-term, lower-impact outcomes.

Scoring Checklist

To ensure that mitigation actions address the most critical community needs and provide measurable benefits, each proposed action was evaluated using a weighted qualitative scoring system. The ranking matrix below was applied consistently across all participating jurisdictions to assess the relative priority of mitigation projects and strategies identified in the plan. Each action was scored from 0 (low relevance) to 3 (high relevance) against seven criteria: Life Safety/Health Impact, Protection of Critical Infrastructure, Support for Vulnerable Populations, Preparedness and Education Enhancement, Technical and Legal Feasibility, Environmental/Cultural Benefit, and Cost-Benefit Justification. The combined total score (maximum possible 21 points) was used to determine the relative priority of each mitigation action appearing in the Mitigation Action Table, helping jurisdictions focus resources on the most impactful and achievable strategies. Mitigation scoring worksheets were used during the planning process to provide the planning committee with a way to prioritize mitigation actions. These worksheets can be referenced in the Appendix.

Table 172. Evaluation Criteria

Criteria	Score (0–3)	Notes
Life Safety / Health Impact		
Protection of Critical Infrastructure		
Support for Vulnerable Populations		
Preparedness / Education Enhancement		
Technical & Legal Feasibility		
Environmental / Cultural Benefit		
Cost-Benefit Justification		
Total Score (Max 21)		Used to rank relative priority



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Note: A total score of 17–21 is considered High Priority, 11–16 is Medium, and 0–10 is Low.

This structured prioritization method allowed jurisdictions to weigh projects consistently, support FEMA grant applications, and ensure that mitigation investments align with local needs and available resources.

Mitigation Actions

Table 173. Active Mitigation Actions

Action ID	Description	Hazard(s) Addressed	Lead Agency / Partners	Priority	Estimated Cost	Potential Funding Sources	Timeframe	Status
PC-1	Continue participation in NFIP and maintain compliance with floodplain regulations	Flood	County Planning, Municipal Planning Depts.	High	Low	Local Funds, NFIP	Ongoing	Ongoing
PC-2	Maintain wildfire mitigation program, including fuels reduction and defensible space education	Wildfire	County Fire, USFS, BLM	High	High	FEMA HMGP/BRIC, USFS, BLM	Ongoing	Ongoing
PC-3	Public education campaign for emergency preparedness, evacuation routes, and sheltering	All Hazards	County OEM	Medium	Low	Local Funds, EMPG	Ongoing	Ongoing
PC-4	Harden critical facilities (backup power,	All Hazards	County OEM, Facility Managers	High	High	FEMA HMGP, PDM/BRIC, Local Funds	1–5 years	Ongoing



Park County Hazard Mitigation Plan 2025

Action ID	Description	Hazard(s) Addressed	Lead Agency / Partners	Priority	Estimated Cost	Potential Funding Sources	Timeframe	Status
	floodproofing, structural retrofits)							
PC-5	Maintain and improve emergency communications system, including redundant power and links	All Hazards	County OEM, Sheriff's Office	High	Medium	DHS, EMPG, Local Funds	1–5 years	Ongoing
PC-6	Improve stormwater infrastructure in known flood-prone areas	Flood	County Road & Bridge, Public Works	High	High	FEMA HMGP, CDBG, Local Funds	1–5 years	Ongoing
PC-7	Continue participation in wildfire protection planning and updates to CWPP	Wildfire	County Fire, OEM	High	Low	Local Funds, State Grants	Ongoing	In Progress
PC-8	Conduct dam safety inspections and maintain EAPs for high-hazard dams	Dam Failure	County OEM, Dam Owners, DNRC	High	Medium	Local Funds, State Grants	Ongoing	In Progress
PC-9	Maintain GIS hazard mapping for planning and response	All Hazards	County GIS, OEM	Medium	Low	Local Funds	Ongoing	In Progress
PC-10	Interoperable Communications for	All Hazards	County, OEM, Municipalities	Medium	Medium	County Funds	Ongoing	Ongoing



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Action ID	Description	Hazard(s) Addressed	Lead Agency / Partners	Priority	Estimated Cost	Potential Funding Sources	Timeframe	Status
	Mutual Aid Support							

Refer to each jurisdiction's annex for jurisdiction-specific mitigation actions and implementation details.



Chapter Five: Jurisdictions

This chapter presents detailed profiles for each participating jurisdiction in the Park County HMP. These profiles fulfill all FEMA-required elements for local mitigation planning, including a summary of past hazard events, vulnerability assessments, existing capabilities, National Flood Insurance Program (NFIP) participation, and locally developed mitigation strategies. The jurisdictions represented in this plan include:

- Park County (unincorporated areas)
- Town of Fairplay
- Town of Alma
- Platte Canyon Fire Protection District
- North-West Fire Protection District
- Lake George Fire Protection District
- South Park Ambulance District

Each jurisdiction participated actively in the planning process and contributed data, resources, and staff input to develop customized mitigation actions based on their unique hazard exposures and capacity to implement strategies.

While many hazards affect the county regionally such as tornadoes, severe storms, and flooding the localized impacts, community assets, and available resources vary greatly. Therefore, the planning process ensured that each jurisdiction's section includes tailored goals, a review of existing policies and programs, an assessment of past and potential future hazard events, and a prioritized list of mitigation actions. These jurisdiction-specific sections ensure compliance with FEMA's mitigation planning requirements under 44 CFR §201.6 and serve as a guide for future grant funding, project development, and community preparedness efforts.



Park County (Unincorporated Areas)

Unincorporated Park County encompasses the vast majority of Park County's 2,211 square miles (2,194 square miles of land), excluding only the two small, incorporated towns of Fairplay (population ~724) and Alma (population ~270). The unincorporated areas contain approximately 16,400 residents, over 94% of the county's total 2020 census population of 17,390. Park County is one of Colorado's original 17 counties established in 1861 and is named for South Park, the large high-altitude grassland basin (average elevation 9,000 feet) that dominates the county's geography. The county seat is Fairplay, located at the junction of U.S. Highway 285 and Colorado Highway 9. Bailey, an unincorporated community in northern Park County's Platte Canyon area, is the county's largest settlement overall with approximately 65% of the county's population living in subdivisions around Bailey. Other significant unincorporated communities include Lake George, Hartsel, Guffey, Jefferson, Como, Grant, and Shawnee. The Board of County Commissioners serves as the legislative, policy-making, and administrative body governing the unincorporated areas. Park County's unincorporated areas are characterized by extremely diverse geography ranging from the high-altitude South Park basin to steep mountain canyons, dense forests, extensive wildland-urban interface, major reservoirs, ranching operations, recreation areas, and widely dispersed residential development across challenging terrain.

The County provides essential services including emergency management, road and bridge maintenance, land use planning and zoning, building inspection, public health, and human services to its geographically vast and dispersed population.

Jurisdiction Profile

Unincorporated Park County spans from the mountain communities of Bailey and Grant in the north (elevation 7,600-8,500 feet) through the vast South Park basin (9,000 feet average elevation) to Guffey in the south. The county stretches from Kenosha Pass in the northwest to Wilkerson Pass in the southwest, bounded by Jefferson and Clear Creek Counties to the north, Teller County to the east, Fremont County to the south, and Chaffee, Lake, and Summit Counties to the west. The geographic center of Colorado is located in Park County near Hartsel. Major geographic features include the South Park basin (900 square miles of high-altitude grassland), the North Fork and Middle Fork of the South Platte River, major reservoirs (Eleven Mile, Spinney Mountain, Antero, Tarryall), the Mosquito Range (including several 14,000-foot peaks), portions of Pike National Forest and the Mount Evans and Lost Creek Wilderness Areas, and the Thirtynine Mile volcanic area. Major transportation corridors include U.S. Highway 285 (Denver to Fairplay and points south), Colorado Highway 9 (north-south through South Park), and U.S. Highway 24 (connecting to Colorado Springs area). The county contains extensive public lands managed by the U.S. Forest Service and state parks. The economy is based on ranching (historic cattle operations producing renowned Park County hay), tourism and recreation (fishing, hunting, camping, off-roading), residential development (primary and second homes), and small businesses. Emergency services are provided through six fire protection districts, South Park Ambulance District, and Park County Sheriff's Office. The County faces significant hazard mitigation challenges including extensive wildland-urban interface, limited water supply for firefighting, long emergency response distances, extreme weather, limited infrastructure, and coordinating across a geographically massive and diverse jurisdiction.



Park County Hazard Mitigation Plan 2025

Table 174. Table of Facts: Park County

Category	Details
Land Area	~2,190 square miles (excluding Fairplay & Alma)
Total County Area	2,211 square miles (2,194 land, 17 water)
Incorporated Towns	Fairplay (~724), Alma (~270)
Unincorporated Population	~16,400 (94% of county total)
Total County Population (2020)	17,390
County Seat	Fairplay (incorporated)
Largest Settlement	Bailey (~8,000-10,000) - 65% of county population
Governance	Board of County Commissioners (3 members)
County Established	1861 (one of original 17 Colorado counties)
Elevation Range	7,000 - 14,000+ feet
South Park Basin Elevation	~9,000 feet average
Major Highways	US 285, CO 9, US 24
Major Communities (Unincorporated)	Bailey, Lake George, Hartsel, Guffey, Jefferson, Como, Grant, Shawnee
Rivers	South Platte River (North & Middle Forks)
Major Reservoirs	Eleven Mile, Spinney Mountain, Antero, Tarryall
Federal Land	Pike National Forest, Mount Evans & Lost Creek Wilderness
State Parks	Eleven Mile State Park, Spinney Mountain State Park
National Heritage Area	South Park National Heritage Area (majority of county)
Notable Feature	Geographic Center of Colorado (near Hartsel)
Historic District	South Park City Museum (Fairplay)
School Districts	Platte Canyon RE-1, South Park RE-2
Law Enforcement	Park County Sheriff's Office
Fire Protection Districts	6 districts (Platte Canyon, Hartsel, SPCFPD/Guffey, Lake George, NW FPD, Jefferson/Como)
Ambulance Service	South Park Ambulance District, Platte Canyon Fire
Emergency Management	Park County Office of Emergency Management
Primary Economy	Ranching, tourism, recreation, residential
Famous Product	Park County native hay (historic world renown)
Annual Event	World Championship Pack Burro Race (Fairplay)



Planning Process

Park County government led a comprehensive Hazard Mitigation Plan update process for the unincorporated areas, which contain 94% of the county's population across 2,211 square miles of diverse terrain. The Park County Office of Emergency Management coordinated the planning process with extensive participation from county departments, all six fire protection districts, law enforcement, public health, public works (roads and bridges), building department, land use planning, and community stakeholders. The planning process included county-wide hazard identification surveys, multiple planning meetings with all jurisdictions, dedicated Hazard Mitigation Planning Committee meetings, public input sessions in Bailey and Fairplay, and coordination with federal land managers (U.S. Forest Service Pike National Forest) and state agencies (Colorado State Forest Service, Colorado Parks and Wildlife). The process assessed hazards affecting the county's diverse geography—from Bailey's mountain canyon communities to the vast South Park basin to remote southern areas.

Key issues analyzed included wildland-urban interface wildfire risk affecting thousands of homes, severe winter weather isolation on three major highways, flooding risks along the South Platte River and tributaries, drought impacts on ranching and water supply, infrastructure vulnerabilities across a geographically massive jurisdiction, limited emergency services capacity, and coordination challenges across multiple fire districts and remote communities. Planning participants included County Commissioners, County Manager, Emergency Manager, Sheriff, Undersheriff, Public Health Director, Road and Bridge Director, Building Official, Planning Director, GIS Coordinator, representatives from all fire districts and ambulance services, school districts, major water providers, ranching community representatives, homeowners association leaders, and concerned citizens. The county coordinated closely with the cities of Fairplay and Alma to ensure comprehensive county-wide mitigation planning. Hazards and Risk Summary

Summary of Past Hazard

Table 175. Historical Hazards: Park County

Date	Event	Description
May 1996	Buffalo Creek Fire	12,000-acre catastrophic wildfire just north of county line; 2 firefighters killed; demonstrated wildfire threat to entire region.
July 1996	Buffalo Creek Flood	Post-fire debris flow killed 2; massive destruction; demonstrated post-fire flood risk throughout county.
September 2006	Platte Canyon High School Shooting	Hostage situation at Bailey school; 1 student killed; county-wide law enforcement and EMS response; demonstrated active shooter preparedness needs.



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December 2006	Holiday Blizzard	Major blizzard closed all three major highways (285, 9, 24); entire county isolated; multiple-day emergency; widespread impacts.
Summer 2012	High Wildfire Season / Drought	Statewide drought; multiple fires throughout county; high alert status county-wide; ranching impacts; water supply concerns.
September 2013	Regional Flooding	Heavy rainfall caused flooding throughout county; North Fork South Platte flooding in Bailey area; road damage; evacuations; swift water rescues.
Winter 2019	Extended Severe Winter	Prolonged extreme cold and heavy snow; highways 285, 9, and 24 frequently closed; extended isolation for all communities; resource strain.
Summer 2020	Regional Wildfire Smoke	Cameron Peak and other fires caused extended poor air quality county-wide; public health impacts; tourism impacts.
Ongoing	Highway Incidents	Regular accidents on US 285, CO 9, US 24; wildlife strikes; high-speed crashes; commercial vehicle incidents; multi-jurisdiction responses.
Ongoing	Recreation Incidents	Drownings, boating accidents, lost hikers, hunting accidents, off-road vehicle incidents across vast recreation areas and reservoirs.

Significant Hazards

Table 176. Hazards: Park County

Hazard Ranking	Hazard
High Hazards	Wildfire, Severe Winter Weather, Highway Accident
Medium Hazards	Flooding, Drought, Extreme Cold, High Wind
Low Hazards	Dam Failure, Avalanche, Lightning, Hazmat



Hazard Specific Vulnerabilities

Wildfire: Wildfire is the highest priority county-wide hazard. The 1996 Buffalo Creek Fire demonstrated catastrophic potential. Park County contains extensive wildland-urban interface across diverse terrain types: dense forests in Bailey/Platte Canyon area with homes interspersed in pine forests; South Park grasslands capable of rapid fire spread with high winds; mountainous forested areas throughout the county with pine beetle kill increasing fuel loads. Thousands of homes are at risk across multiple fire district jurisdictions. Limited water supply for firefighting in many areas (no hydrants in most locations). Coordination challenges across six fire protection districts with varying capabilities. Narrow, winding access roads limit evacuation and apparatus response. Post-fire flooding presents secondary hazard (1996 Buffalo Creek Flood). Lightning is a frequent ignition source. Human-caused ignitions from recreation, equipment, and other sources. Climate change extending fire season and increasing severity.

Severe Winter Weather: Winter storms regularly close all three major highways (US 285, CO 9, US 24), isolating all county communities from each other and from regional resources. Bailey area (7,600-8,500 feet) and South Park basin (9,000 feet) both vulnerable. Kenosha Pass, Wilkerson Pass, and Trout Creek Pass all close during major storms. Multi-day isolation is common. Medical emergencies become critical with no access to Denver-area or Colorado Springs hospitals. Snow load damages structures. Extreme cold (-20°F to -40°F in South Park basin). Ground blizzards reduce visibility to zero. County roads and bridges are vulnerable to winter damage. Emergency services strained during prolonged events. Ranching operations impacted.

Highway Accident: Three major highways traverse the county carrying significant traffic. US 285 is a primary Denver-to-mountains corridor with heavy traffic, high speeds, steep grades, sharp curves, and frequent wildlife. The 2006 Platte Canyon High School incident demonstrated county-wide emergency response coordination. Multiple jurisdictions (Sheriff, multiple fire districts) must coordinate on highway incidents. Commercial vehicle crashes present hazmat risks. Extrication capabilities vary across fire districts. Weather conditions (winter, wildlife strikes) increase crash frequency. Tourism traffic increases seasonal risk.

Flooding: The North Fork and Middle Fork South Platte River and numerous tributaries create flood risk. The 1996 post-Buffalo Creek Fire flood demonstrated catastrophic post-fire debris flow potential—a hazard that will recur after future wildfires. Spring runoff flooding along rivers. Flash flooding in steep terrain. Highway 285 crosses numerous drainages. Bridges vulnerable to washout. The 2013 flooding impacted multiple areas. Future wildfires will create enhanced flood risk in burned watersheds.

Drought: Drought impacts county-wide wildfire risk, threatens ranching operations (historically important to county economy), stresses water supply for firefighting, affects recreation and tourism at reservoirs, and creates economic impacts. The semi-arid high-altitude environment is naturally drought prone. Climate change may increase drought frequency and severity.

Extreme Cold: South Park basin acts as a cold sink with temperatures regularly -30°F to -40°F. Bailey area also experiences -20°F temperatures. Extreme cold affects infrastructure, increases medical emergencies (cardiac, hypothermia), challenges emergency response, and impacts livestock operations.



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High Wind: South Park's open basin experiences sustained high winds (40-60+ mph common, 100+ mph during severe events). Winds drive rapid wildfire spread in grasslands, create ground blizzards, damage structures and power lines, and create hazardous driving. Bailey area also experiences periodic high wind events.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 177. Facilities & Infrastructure Assessment: Park County

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Park County Courthouse (Fairplay)	Wildfire, Winter	No	No	Yes	Yes
Sheriff's Office (Fairplay)	Wildfire, Winter	No	No	Yes	Yes
Emergency Operations Center	All Hazards	No	No	Yes	Yes
Park County Road & Bridge	Winter, Flood	Partial	No	Partial	Yes
6 Fire District Stations	Wildfire, Winter	Varies	No	Varies	Varies
Schools (2 Districts)	Wildfire, Snow Load	No	No	Partial	Varies
Medical Clinics (Fairplay)	Wildfire, Winter	No	No	Yes	Yes
Bailey Silverheels Health Center	Wildfire	No	No	Yes	Yes
US Highway 285	Wildfire, Winter, Flood	Partial	Yes	Partial	N/A
Colorado Highway 9	Winter, Wildfire	No	No	Partial	N/A
US Highway 24	Winter, Wildfire	No	No	Partial	N/A
Kenosha Pass	Winter	N/A	N/A	No	N/A
County Bridges (100+)	Flood, Age	Varies	Some	Ongoing	N/A



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Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Communication Towers	Lightning, Wildfire	No	No	Yes	Yes
Major Reservoir Dams (4)	Dam Failure	Yes	No	Yes	N/A

Potential Loss

Table 178. Potential Loss: Park County

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High Risk)	650,000	10,500	\$3,675,000,000	3,150	\$1,102,500,000
Wildfire (Moderate Risk)	480,000	10,500	\$3,675,000,000	2,100	\$735,000,000
Post-Fire Flood	75,000	10,500	\$3,675,000,000	1,050	\$367,500,000
Flood (100-year)	45,000	10,500	\$3,675,000,000	850	\$297,500,000
Severe Winter Weather	1,403,520	10,500	\$3,675,000,000	10,500	\$183,750,000
Drought (economic)	1,403,520	N/A	N/A	N/A	\$50,000,000

Vulnerable Populations

Unincorporated Park County's vulnerable populations include:

- School children at multiple schools across two districts requiring safe shelter, evacuation, and emergency planning (2006 Platte Canyon High School incident)
- Residents of Bailey and surrounding subdivisions (65% of county population) in wildland-urban interface with limited evacuation routes
- Elderly residents with medical conditions requiring extended transport times to Denver-area hospitals (45+ minutes from Bailey, 2+ hours from South Park)
- Remote ranch residents across South Park basin living far from emergency services



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- Residents in areas with single-access roads that can be cut off by wildfire or winter storms
- Lower-income households with limited resources for wildfire mitigation and emergency preparedness
- Seasonal residents and second-home owners unfamiliar with wildfire risks and winter hazards
- Residents dependent on wells and private water systems without municipal backup
- Highway travelers on US 285, CO 9, and US 24 during severe weather or wildfire evacuations
- Recreation visitors (500,000+ annually at reservoirs plus extensive forest recreation) unfamiliar with hazards
- Ranchers and agricultural workers at risk for equipment accidents and weather exposure
- Residents in structures without defensible space in forested areas
- People with disabilities or special medical needs in remote locations
- Communities isolated when Kenosha Pass, Wilkerson Pass, or Trout Creek Pass close
- Residents in post-fire flood zones after future wildfires
- Historic structure occupants in older mining-era buildings

Capability Assessment

Table 179. Capability Assessment: Park County

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Board of County Commissioners (3) ☒ County Manager ☒ Emergency Manager ☒ Sheriff & Undersheriff ☒ Department Heads (multiple)
Technical	☒ GIS / Mapping ☒ Engineering (contracted) ☒ Wildfire Assessment (CSFS) ☒ Planning & Zoning ☒ Building Inspection
Financial	☒ County Property Tax ☒ FEMA Grants (HMGP, PDM, BRIC) ☒ State Grants (DOLA, CDOT) ☒ Federal: FHWA, USFS, NRCS
Operational	☒ Law Enforcement (Sheriff) ☒ Emergency Management ☒ Search and Rescue ☒ Road and Bridge Maintenance ☒ Snow Removal ☒ Public Health
Regulatory	☒ Land Use Planning ☒ Zoning Regulations ☒ Building Codes ☒ Wildfire Mitigation Standards ☒ Subdivision Regulations ☒ NFIP Participation
Planning	☒ Comprehensive Plan ☒ Emergency Operations Plan ☒ Continuity of Operations Plan ☒ Community Wildfire Protection Plan ☒ Hazard Mitigation Plan



Capability Area	Available Resources / Programs (Check all that apply)
Coordination	☒ 6 Fire Protection Districts ☒ School Districts (2) ☒ USFS Pike National Forest ☒ Colorado State Forest Service ☒ Colorado Parks and Wildlife

National Flood Insurance Program Compliance

NFIP Participation Status

Park County participates in the National Flood Insurance Program (NFIP) and enforces floodplain management regulations in unincorporated areas. The County is in the process of electing a new Floodplain Administrator once they complete their certification. The County's Planning Department also assists with floodplain management by reviewing the development proposals in mapped floodplains along the North Fork and Middle Fork South Platte River and tributaries. The County is particularly aware of post-fire flood risks following the 1996 Buffalo Creek Fire and subsequent debris flow that killed two people. Future wildfires will create enhanced flood risks in burned watersheds throughout the county. The County coordinates with fire districts on wildfire response and works to educate property owners about post-fire flooding hazards.

Number of Policies and Repetitive Loss Properties

Table 180. Policies and Repetitive Loss Properties: Park County

Category	2015	2025
Policies	N/a	N/a
Number of Repetitive Loss Structures	N/a	N/a

Specific repetitive and severe repetitive loss information for the county is unknown at the time. The County will address this deficiency.

Floodplain Management Regulations and Enforcement

Park County enforces floodplain management regulations through its building permit and development review process. The county requires all development in designated flood hazard areas to comply with NFIP standards including elevation requirements, floodproofing, and restrictions on critical facilities. Specific information can be referenced in the [Park County Floodplain Ordinance](#) on pages 40-60.

Substantial Improvements and Substantial Damages

As part of participation in the National Flood Insurance Program (NFIP), Park County enforces substantial improvement and substantial damage requirements through local floodplain management ordinances. These provisions ensure that when structures in the Special Flood Hazard Area (SFHA) are substantially improved, reconstructed, or suffer



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damage equal to or exceeding 50 percent of their market value, they must be brought into compliance with current floodplain regulations.

Currently, no countywide recordkeeping system exists that aggregates substantial improvement and substantial damage determinations across NFIP communities; however, local floodplain administrators report that these determinations are made on a case-by-case basis through the permitting and inspection process. Following flood events, building inspectors and emergency management personnel conduct damage assessments to identify structures that may trigger substantial damage determinations. Future mitigation actions may include improving the consistency of substantial improvement and substantial damage documentation and integrating it with local permitting systems to better track post-flood compliance and elevation requirements.

CRS (Community Rating System) Participation

Park County does not currently participate in the Community Rating System. The county is evaluating CRS participation to provide reduced flood insurance premiums for property owners and to formalize existing flood mitigation activities.

Integration with Other Plans

Table 181. Planning Documents: Park County

Planning Documents	Status
Comprehensive Plan	County master plan for unincorporated areas
Emergency Operations Plan	County-wide EOP maintained and exercised
Continuity of Operations Plan	COOP for county government operations
Community Wildfire Protection Plan	County-wide CWPP; coordinates 6 fire districts (currently being updated)
Floodplain Management Plan	Regulations for NFIP compliance
Land Use Regulations	Zoning, subdivision, land use code
Building Code	Adopted building codes enforced
Wildfire Mitigation Standards	Standards for WUI development
Road and Bridge Standards	Standards for county infrastructure
Dam Emergency Action Plans	Plans for 4 major reservoirs
Public Health Emergency Plan	County public health preparedness
Active Shooter Response Plan	Developed after 2006 school incident
Drought Management Plan	Coordination with water providers



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Mitigation Strategy

Table 182. Mitigation Actions: Park County

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high, medium or low cost.									
PC-1: County-wide CWPP Update	Comprehensive wildfire planning	Update County-wide Community Wildfire Protection Plan; coordinate 6 fire districts; identify priorities; engage all communities	Wildfire	Park County EM	\$100,000	1-2	CSFS, VFA, FEMA, County	High	Local Plans & Regulations
PC-2: Emergency Communication Upgrade	Improve county-wide communications	Upgrade county emergency communications system; improve interoperability between 6 fire districts, Sheriff, EMS; fill coverage gaps	All Hazards	Park County /Sheriff	\$1,500,000	2-4	FEMA EMPG, State 911, County	High	Structure & Infrastructure
PC-3: Strategic Fuel	Reduce fuel	Large-scale fuel reduction	Wildfire	County /CSFS/ USFS	\$2,500,000	3-5	CSFS, USFS,	High	Natural Systems



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
Reduction	y-wide wildfire risk	projects county-wide: forest thinning, prescribed fire, grassland fuel breaks, defensible space programs					FEMA, County		Protection
PC-4: Critical Bridge Replacement	Improve emergency access	Replace/up grade critical county bridges vulnerable to flooding; prioritize emergency access routes and evacuation corridors	Flood, All Hazards	Park County R&B	\$3,000,000	3-5	FHWA, FEMA HMGP, DOLA, County	High	Structure & Infrastructure
PC-5: EOC Capability Enhancement	Improve emergency operations	Enhance Emergency Operations Center: equipment upgrades, training, backup systems, multi-agency coordination capabilities	All Hazards	Park County EM	\$150,000	1-3	FEMA EMPG, State, County	High	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
PC-6: County-wide Evacuation Planning	Improve evacuation capability	Comprehensive evacuation planning for all communities; identify routes; address bottlenecks; coordinate with fire districts; public education	Wildfire, All Hazards	Park County EM	\$75,000	1-2	FEMA EMPG, County	Medium	Local Plans & Regulations
PC-7: Public Alert System Expansion	Enhance public warning	Expand CodeRED system; increase enrollment; add outdoor warning sirens in key locations; improve messaging capabilities	All Hazards	Park County EM	\$200,000	2-3	FEMA EMPG, County	Medium	Public Education
PC-8: County Road Improvements	Improve emergency access	Strategic county road improvements for emergency access: widening, turnaround s,	Wildfire, All Hazards	Park County R&B	\$1,500,000	3-5	DOLA, CDOT, County	Medium	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		secondary access where feasible, signage							
PC-9: Post-Fire Flood Planning	Prepare for post-fire flooding	Develop comprehensive post-fire flood response plans; identify vulnerable areas after potential wildfires; pre-position resources; educate public	Flood (Post-Fire)	Park County EM	\$50,000	1-2	FEMA, NRCS, County	Medium	Local Plans & Regulations
PC-10: Wildfire Mitigation Program	Increase community preparedness	County-wide wildfire education program: defensible space assessments, Firewise Community development, home hardening, evacuation planning	Wildfire	County /CSFS	\$150,000	Ongoing	CSFS, VFA, County	Medium	Public Education
PC-11: Drought Response	Prepare for drought	Develop drought response plan: water supply	Drought	Park County	\$30,000	1-2	State, County	Low	Local Plans & Regulations



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
nse Plan	impacts	monitoring, fire restrictions coordination, ranching assistance, recreation impacts							
PC-12: Multi-Agency Training	Improve coordination	Regular multi-agency training exercises: Sheriff, 6 fire districts, EMS, public health, schools; tabletop and full-scale exercises	All Hazards	Park County EM	\$40,000	Ongoing	FEMA EMPG, County	Low	Public Education
PC-13: GIS/Mapping Enhancement	Improve situational awareness	Enhance GIS capabilities : wildfire risk mapping, evacuation route mapping, critical infrastructure database, real-time operations	All Hazards	Park County	\$75,000	1-3	FEMA, State, County	Low	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
PC-14: School Emergency Planning	Enhance school safety county-wide	Comprehensive emergency planning for all county schools: wildfire evacuation, active shooter, lockdown, reunification; regular drills	All Hazards	County /School Districts	\$50,000	1-2	School Districts, State, County	Low	Local Plans & Regulations
PC-15: Public Outreach Program	Increase public preparedness	Comprehensive public education: website, social media, community meetings, preparedness fairs, emergency kits, evacuation planning	All Hazards	Park County EM	\$35,000	Ongoing	FEMA EMPG, County	Low	Public Education

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Time Ellis **Title:** Park County Deputy Emergency Manager

Email: tim.ellis@parkcountycolorado.gov **Phone:** 719.836.4372

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Quarterly Emergency Management meetings ☐ Community surveys
☒ Board of County Commissioners meetings ☒ Other: Multi-agency coordination meetings, LEPC meetings, fire district coordination, incident reviews, seasonal preparedness reviews



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Park County will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Emergency Manager and Board of County Commissioners with presentation to Commissioners
- Quarterly Emergency Management coordination meetings with Sheriff, fire districts, EMS, public health, public works, and other stakeholders
- Integration of mitigation actions into County budget process, capital improvement planning, and grant application priorities
- Regular coordination meetings with all six fire protection districts to assess wildfire mitigation progress and coordinate county-wide efforts
- Coordination with U.S. Forest Service Pike National Forest and Colorado State Forest Service for wildfire mitigation projects
- After-action reviews following significant incidents to identify lessons learned and update plans (process established after 1996 Buffalo Creek Fire and 2006 school incident)
- Annual wildfire season preparedness review including coordination with fire districts, Sheriff, public information, and CodeRED alert system
- Winter preparedness review including coordination with Road and Bridge Department, Sheriff, fire districts for highway closure planning
- Local Emergency Planning Committee (LEPC) meetings to address hazmat, infrastructure, and multi-hazard planning
- Coordination with school districts (Platte Canyon RE-1, South Park RE-2) for school emergency planning and student safety
- Public information campaigns coordinated with fire districts, particularly Fire Adapted Bailey and Firewise Communities
- Grant progress reporting to state and federal agencies with documentation of mitigation outcomes
- Five-year comprehensive plan update with extensive public participation, all fire districts, and stakeholder engagement
- GIS mapping updates to track wildfire risk, completed mitigation projects, vulnerable areas, and critical infrastructure
- Coordination with incorporated towns of Fairplay and Alma for comprehensive county-wide planning
- Annual training exercises involving multiple agencies to test coordination and plans
- Community Wildfire Protection Plan updates coordinating all six fire districts
- Post-fire flood planning following any significant wildfire in or near county boundaries
- Floodplain management program monitoring for NFIP compliance and effectiveness
- Building code enforcement tracking to ensure wildfire mitigation standards are met in new construction



Town of Alma

The Town of Alma is located in northern Park County along State Highway 9 and holds the distinction of being the highest incorporated municipality in the United States at over 10,500 feet. The town spans just 0.4 square miles and has a population of approximately 270. Its mountainous setting within the Mosquito Range makes it prone to heavy snow accumulation, avalanche potential, and geologic hazards such as rockfall and landslides. Streams such as Mosquito Creek pass through the area, adding to localized flood concerns during spring melt. While small in size, Alma is a gateway for outdoor recreation and mining activity, necessitating robust planning for emergency response and evacuation under severe winter or wildfire conditions. Alma partners with county and regional agencies to address these challenges through planning, community engagement, and hazard mitigation support.

Jurisdiction Profile

Alma is the highest incorporated municipality in the United States, located at over 10,000 feet in elevation along State Highway 9 in northern Park County. With a population of approximately 320, the town is subject to extreme winter weather, rockfalls, and wildfire, due to steep slopes and surrounding forestland. Alma operates its own town services and partners with county and regional emergency response agencies. Mitigation priorities focus on avalanche and snow load safety, emergency access maintenance, and community wildfire preparedness.

Table 183. Table of Facts: Town of Alma

Category	Details
Land Area	0.4 square miles
Incorporated Village(s)	None
Population Census	270
Governance	Mayor-Trustee Government
Highest Elevation	10,578 feet
Largest Lake	None
River(s)	Buckskin Creek and Middle Fork South Platte
Dams	None within town limits
Bridges	Limited bridges over creeks Bridges on Hwy 9
Interstate Highway	None
State Routes	CO Hwy 9
County Roads	None in town
Land Agriculture Use	Minimal
Land Classified Industrial	Low



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Category	Details
Land Classified Residential	Residential Focus
Hospital/Medical Facility	None in town (served regionally)
Fire & Rescue	Alma Fire Station (NWFPD)
Schools	None in town
Railroads	None
Largest Employer	Small local businesses
Law Enforcement	Town of Fairplay Police Department Park County Sheriff (support)
Correctional Facility	No
Power Utility Provider(s)	Xcel Energy
Water Supply Source(s)	Town Water System
Emergency Shelters	Town Hall, Fire Station (as needed)
Critical Facilities	Town Office, Fire Station

Planning Process

The Town of Alma participated actively in the Park County Hazard Mitigation Plan update process. The jurisdiction participated in a Survey, planning meetings, followed by a Hazard Mitigation Meeting, sent a copy of their portion of the County plan for update and reviewed their portion of the update. The Town Board and designated emergency management coordinator reviewed all hazard assessments, vulnerability data, and proposed mitigation actions. Meeting attendees included the Town Mayor, Town Clerk, and representatives from the Alma Fire Department.

Hazards and Risk Summary

Summary of Past Hazard

Table 184. Historical Hazards: Town of Alma

Date	Event	Description
Winter 2006-2007	Heavy Snowfall	Excessive snow accumulation led to roof damage on several structures; Highway 9 closures impacted emergency access.
Spring 2011	Spring Flooding	Rapid snowmelt caused Mosquito Creek overflow, minor property flooding in low-lying areas.



Park County Hazard Mitigation Plan 2025

Summer 2012	Wildfire Threat	Regional wildfire smoke impacted air quality; no direct fire threat to town but evacuation routes reviewed.
September 2013	Flooding Event	Part of statewide floods; minor impacts to drainage infrastructure and temporary road closures.
Winter 2019	Avalanche Risk	High avalanche danger closed portions of Highway 9; no direct impacts to town but isolated community temporarily.
Summer 2020	Wildfire Season	Regional wildfires increased awareness; community wildfire mitigation efforts initiated.

Significant Hazards

Table 185. Hazards: Town of Alma

Hazard Ranking	Hazard
High Hazards	Severe Winter Weather, Avalanche, Wildfire
Medium Hazards	Flooding, Landslide/Rockfall, Drought
Low Hazards	Earthquake, Lightning, Hazardous Materials Incident

Hazard Specific Vulnerabilities

Severe Winter Weather: At 10,578 feet elevation, Alma experiences extreme winter conditions including heavy snowfall, high winds, and prolonged cold temperatures. Roof collapse from snow load is a primary concern for older structures. Highway 9, the town's only major access route, is vulnerable to closure, potentially isolating the community for extended periods.

Avalanche: Steep mountainous terrain surrounding Alma creates significant avalanche risk. While most avalanche paths do not directly threaten structures, Highway 9 traverses several avalanche zones that can cut off access to the town. Backcountry recreationalists in the area are at elevated risk.

Wildfire: Surrounding forestland and dry conditions during summer months create wildfire vulnerability. Limited evacuation routes and isolated location increase risk. Wildfire smoke from regional fires frequently impacts air quality.

Flooding: Buckskin Creek and the Middle Fork of the South Platte and other drainages pose flood risk during rapid spring snowmelt and intense summer thunderstorms. Limited drainage infrastructure and steep terrain can lead to flash flooding.



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Landslide/Rockfall: Steep slopes and historic mining activity create rockfall and landslide hazards. Abandoned mine workings may be unstable. Highway 9 is vulnerable to rockfall in several locations.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 186. Facilities & Infrastructure Assessment: Town of Alma

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Town Hall	Snow Load	No	No	Partial	No
Fire Station (NWFPD)	Snow Load, Wildfire	No	No	Yes	Yes
Water Treatment Plant	Flood	No	Minor	Partial	Yes
Highway 9 Bridges	Flood, Avalanche	No	No	Yes	N/A
Community Center	Snow Load	No	No	Yes	No
Xcel Energy Power Lines	Winter Storm, Wildfire	No	N/A	No	N/A
Water Distribution System	Freeze, Break	No	Yes	Partial	N/A
Montgomery Dam	Dam Failure, Flood	No	N/A	N/A	N/A

Potential Loss

Table 187. Potential Loss: Town of Alma

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High Risk)	256	85	\$21,250,000	43	\$10,750,000
Flood (100-year)	12	85	\$21,250,000	8	\$2,000,000
Snow Load	256	85	\$21,250,000	15	\$750,000
Landslide/Rockfall	45	85	\$21,250,000	5	\$1,250,000



Vulnerable Populations

The Town of Alma's vulnerable populations include:

- Elderly residents (approximately 15% of population) who may have difficulty evacuating or maintaining homes during severe weather
- Year-round residents with limited mobility or health conditions requiring regular medical access
- Low-income households with limited resources for emergency preparedness or property mitigation
- Seasonal workers and tourists unfamiliar with mountain hazards
- Residents of older structures not built to current snow load or wildfire standards
- Households dependent on single access route (Highway 9) for medical emergencies

Capability Assessment

Table 188. Capability Assessment: Town of Alma

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Emergency Management (through Park County) ☐ Planning Department ☒ Building/Zoning (limited)
Technical	☒ GIS / Mapping (through County) ☐ Engineering (contracted) ☐ Floodplain Management (through County)
Financial	☒ General Budget (limited) ☒ FEMA Grants ☒ Other Grants: DOLA, CDPHE
Legal / Policy Tools	☒ Zoning Ordinance (basic) ☒ Building Codes (IBC adopted) ☐ Subdivision Regulations ☐ Floodplain Ordinance ☐ Comprehensive Plan
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Enhance Warning and Notification Capabilities • Expand partnerships and MOU's • Expand floodplain management and overall planning for the town	

National Flood Insurance Program Compliance

NFIP Participation Status

The Town of Alma does not currently participate in the National Flood Insurance Program (NFIP). Given the limited flood risk and small number of structures, the town has not pursued NFIP participation. Flooding concerns are primarily addressed through Park County coordination and stormwater management practices.



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Number of Policies and Repetitive Loss Properties

Table 189. Policies and Repetitive Loss Properties: Town of Alma

Category	2015	2025
Policies	0	0
Number of Repetitive Loss Structures	0	0

Floodplain Management Regulations and Enforcement

Floodplain management within Alma is coordinated through Park County. The town reviews proposed development for flood risk and requires compliance with county floodplain regulations. Due to limited staff, enforcement is conducted in partnership with county officials.

CRS (Community Rating System) Participation

The Town of Alma does not participate in the Community Rating System, as it is not enrolled in the NFIP.

Integration with Other Plans

Table 190. Planning Documents: Town of Alma

Planning Documents	Status
Emergency Operations Plan	Coordinated through Park County
Comprehensive Emergency Management Plan	Coordinated through Park County
Community Wildfire Protection Plan	Currently being updated
Continuity of Operations Plan	In Development
Floodplain Regulations	Follows Park County
Zoning Regulations	Basic zoning adopted
Subdivision Regulations	None (limited development)
Comprehensive Land Use Plan	None
Natural Resources Protection Plan	None
Economic Development Plan	None
Historic Preservation Plan	None (informal efforts)
Farmland Preservation Plan	N/A
Building Codes	International Building Code adopted
Fire Codes	International Fire Code adopted



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Mitigation Strategy

Table 191. Mitigation Actions: Town of Alma

Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
A-1: Emergency Generator	Ensure critical facility operations during power outages	Install backup generator at Town Hall with fuel storage	Winter Storm, Wildfire	Town of Alma	\$45,000	1-2	FEMA HMGP, DOLA EIAF	High	Structure & Infrastructure
A-2: Wildfire Mitigation	Reduce wildfire risk to structures	Implement community-wide defensible space program and fuel reduction around critical facilities	Wildfire	Town/N WFPD	\$35,000	1-3	CSFS Grants, FEMA	High	Natural Systems Protection
A-3: Snow Load Assessment	Identify vulnerable structures	Conduct structural assessment of town buildings and public facilities for snow	Winter Weather	Town of Alma	\$15,000	1-2	Town Budget	High	Local Plans & Regulations



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		load capacity							
A-4: Emergency Route Improvement	Maintain emergency access	Partner with CDOT to improve avalanche mitigation and winter maintenance on Highway 9 critical sections	Avalanche, Winter Storm	Town/C DOT/County	\$250,000	2-5	FEMA PDM, CDOT	High	Structure & Infrastructure
A-5: Public Education	Increase hazard awareness	Develop and distribute hazard awareness materials covering winter preparedness, wildfire, and evacuation	All Hazards	Town of Alma	\$5,000	1	Town Budget, FEMA	Medium	Public Education
A-6: Water System Upgrades	Prevent freeze-related failures	Upgrade water distribution infrastructure with freeze protection and redundant systems	Winter Weather	Town of Alma	\$125,000	2-4	DOLA EIAF, USDA	Medium	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
A-7: Drainage Improvements	Reduce flood risk	Improve drainage infrastructure near Mosquito Creek and critical low-lying areas	Flooding	Town of Alma	\$75,000	3-5	FEMA FMA, DOLA	Medium	Structure & Infrastructure
A-8: Emergency Shelter Supplies	Support emergency operations	Stock emergency shelter supplies at Community Center including heating, communications, medical	All Hazards	Town of Alma	\$8,000	1-2	Town Budget, FEMA EMPG	Medium	Structure & Infrastructure
A-9: CWPP Development	Formalize wildfire planning	Develop Community Wildfire Protection Plan in coordination with CSFS and fire district	Wildfire	Town/N WFPD/ CSFS	\$20,000	1-2	CSFS, FEMA	Low	Local Plans & Regulations
A-10: Historic Structure Protection	Preserve community character while improving	Assess and retrofit historic mining-era buildings for snow load and wildfire	Winter Weather, Wildfire	Town of Alma	\$50,000	3-5	State Historical Fund	Low	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
	safety	resistance							

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Bob Kassel **Title:** Mayor

Email: bob.kassel@townofalma.com **Phone:** 719-836-2696

How will this jurisdiction monitor and evaluate progress?

- ☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Council meetings ☒ Other: Coordination with NWFPD and review after hazard events

The Town of Alma will monitor and implement this Hazard Mitigation Plan through:

- Annual review by Town Board and Emergency Coordinator in conjunction with budget planning
- Participation in Park County Emergency Management updates and regional planning meetings
- Regular coordination with Northwest Fire Protection District for wildfire and emergency response planning
- Review and update following any significant hazard event affecting the community
- Integration of mitigation actions into capital improvement planning and grant applications
- Quarterly progress reports to Town Board on mitigation action implementation
- Five-year comprehensive update in coordination with Park County's plan update cycle

Town of Fairplay

The Town of Fairplay is the county seat and largest incorporated municipality in Park County, located at an elevation of 9,953 feet in the South Park basin. With a population of approximately 740 residents, Fairplay serves as the administrative and commercial center for the county. The town is situated along U.S. Highway 285 and State Highway 9, providing critical transportation connections through the region. Fairplay's location in the broad, high-altitude grassland basin exposes it to severe winter weather, flooding from the South Platte River and its tributaries, wildfire risk from surrounding forests, and other natural hazards.

As a historic gold mining settlement founded in 1859, Fairplay contains numerous historic structures and serves as a hub for tourism, government services, and outdoor recreation.



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The town operates its own municipal services and coordinates closely with Park County Emergency Management for hazard mitigation and emergency response planning.

Jurisdiction Profile

Fairplay is a statutory town and the county seat of Park County, located at 9,953 feet elevation in South Park. With a population of approximately 740, the town serves as the regional center for government, commerce, education, and emergency services. Fairplay experiences extreme weather conditions including heavy winter snowfall, severe cold, high winds, and summer thunderstorms. The town is vulnerable to flooding from the South Platte River, wildfire from nearby forests, and winter storm impacts. As the fifth-highest incorporated municipality in Colorado, Fairplay must balance historic preservation with modern hazard mitigation needs while serving as the hub for Park County's dispersed population.

Table 192. Table of Facts: Town of Fairplay

Category	Details
Land Area	~1.4 square miles
Incorporated Village(s)	None
Population Census	~740 (2025 estimate)
Governance	Mayor- Board of Trustees
Highest Elevation	~9,953 feet
Largest Lake	None in town limits
River(s)	South Platte River, tributaries
Dams	There is a dam at the beach
Bridges	Multiple highway and local bridges
Interstate Highway	None
State Routes	US Highway 285, CO Highway 9
County Roads	Yes
Land Agriculture Use	Limited (primarily grazing)
Land Classified Industrial	Low (some mining)
Land Classified Residential	Primarily Residential/Commercial
Hospital/Medical Facility	South Park Health Service District (HRRMC)
Fire & Rescue	North-West Fire Protection District / South Park Ambulance District
Schools	Park County School District RE-2 (Preschool, Elementary, Middle & High School)
Railroads	Historic (no active rail service)



Park County Hazard Mitigation Plan 2025

Category	Details
Largest Employer	Park County Government
Law Enforcement	Fairplay Police Department / Park County Sheriff's Office
Correctional Facility	Park County Jail
Power Utility Provider(s)	Xcel Energy
Water Supply Source(s)	Town of Fairplay Water Utility
Emergency Shelters	School buildings, Community Center
Critical Facilities	County Courthouse, Town Hall, Police, Public Works Utilities, School

Planning Process

The Town of Fairplay actively participated in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process. As the county seat, Fairplay's involvement was critical to the comprehensive planning effort. The jurisdiction participated in hazard identification surveys, planning meetings with county emergency management staff, and a dedicated Hazard Mitigation Meeting. Town officials reviewed and provided input on all sections of the plan relevant to Fairplay's unique vulnerabilities as the largest community in South Park. Meeting attendees included the Town Administrator/Clerk and Mayor and members of the Town Board, and representatives from Northwest Fire Protection District. The town coordinated closely with Park County Emergency Management, the Sheriff's Office, and regional partners to ensure alignment between municipal and county-level hazard mitigation strategies.

Hazards and Risk Summary

Summary of Past Hazard

Table 193. Historical Hazards: Town of Fairplay

Date	Event	Description
December 2006	Holiday Blizzard	Major blizzard closed highways for multiple days; emergency access severely limited; snow removal operations overwhelmed.
June 2007	Wildfire Smoke	Regional wildfires caused poor air quality for extended period; vulnerable populations affected.
Spring 2011	Spring Flooding	Heavy snowpack melt caused South Platte River flooding; low-lying properties impacted; bridge concerns.



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Date	Event	Description
Summer 2012	Wildfire Threat	Statewide wildfire season increased evacuation planning; smoke impacts on tourism and health.
September 2013	Front Range Flooding	While Fairplay avoided major damage, county infrastructure severely impacted; demonstrated need for emergency preparedness.
Winter 2019	Extended Cold Period	Multiple weeks of extreme cold (-20°F to -30°F); water system freezing concerns; increased heating demands.
Summer 2020	Wildfire Season	Cameron Peak and other fires caused regional smoke; combined with COVID-19 pandemic created public health concerns.
March 2021	Late Winter Storm	Heavy March snowfall caused roof damage to commercial buildings; demonstrated snow load vulnerability.

Significant Hazards

Table 194. Hazards: Town of Fairplay

Hazard Ranking	Hazard
High Hazards	Severe Winter Weather, Flooding, Wildfire
Medium Hazards	Drought, Extreme Temperatures, Hazardous Materials Incident
Low Hazards	Landslide, Earthquake, Dam Failure, Lightning

Hazard Specific Vulnerabilities

Severe Winter Weather: Fairplay is notorious for blizzards and extreme winter conditions. At nearly 10,000 feet elevation, the town experiences heavy snowfall (average 150+ inches annually), high winds creating whiteout conditions, and temperatures routinely dropping below -20°F. The town's role as county seat means critical government services must remain operational during severe weather. Highway closures can isolate the community and prevent emergency response. Snow load on older historic structures and commercial buildings is a significant concern. The town's water distribution system is vulnerable to freeze damage during extended cold periods.



Flooding: The South Platte River flows along the northern edge of Fairplay, with several tributaries passing through town. Spring snowmelt flooding poses the most significant risk, particularly during years with heavy snowpack followed by rapid warming. Low-lying areas including Front Street, residential neighborhoods near the river, and the historic South Park City museum are vulnerable. Summer thunderstorms can cause flash flooding in drainage channels. Bridge infrastructure is aging and vulnerable to flood damage or debris impacts. The 2013 floods highlighted the need for improved stormwater management and flood warning systems.

Wildfire: While Fairplay sits in the relatively open South Park grassland, the town is surrounded by forested mountains and timbered areas to the west and south. Wildfire risk is elevated during dry conditions, particularly late summer. The wildland-urban interface along the western hillside where many residences are located creates defensible space challenges. Historic downtown structures with wood construction increase fire spread risk. Limited water supply for firefighting in outlying areas is a concern. Smoke from regional wildfires impacts tourism, outdoor activities, and vulnerable populations even when direct fire threat is minimal.

Drought: Extended drought conditions impact Fairplay's water supply, increase wildfire risk, and stress agricultural operations in surrounding areas. Water supply concerns are heightened by increasing development pressure and tourism. Drought conditions make vegetation more flammable and reduce available water for firefighting operations.

Hazardous Materials Incident: US Highway 285 is a major transportation corridor with significant hazardous materials transport through town. Historic mining operations left behind contaminated sites. Propane and fuel storage facilities pose explosion and contamination risks. Limited hazmat response capabilities at the local level increase vulnerability.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 195. Facilities & Infrastructure Assessment: Town of Fairplay

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Park County Courthouse	Snow Load, Fire	No	No	Partial	Yes
Town Hall	Snow Load, Fire	No	No	Yes	Yes
Park County Health Clinic	Snow Load, Fire	No	No	Yes	Yes
Fire Station #1	Snow Load	No	No	Yes	Yes
South Park Schools	Snow Load, Wildfire	No	No	Yes	Partial



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Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Water Treatment Plant	Flood, Freeze, Fire	No	Minor	Yes	Yes
Wastewater Treatment	Flood, Freeze	Yes	Minor	Partial	Yes
Public Works Facility	Snow Load, Flood, Fire	No	No	Yes	Yes
US Highway 285 Bridges	Flood	Yes	No	Yes	N/A
Sherriff's Office/ Jail	Snow Load	No	No	Yes	Yes
Community Center	Snow Load	No	No	Partial	No
Xcel Energy	Contact Xcel	Contact Xcel	Contact Xcel	Contact Xcel	Contact Xcel

Potential Loss

Table 196. Potential Loss: Town of Fairplay

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High/Moderate)	180	425	\$127,500,000	95	\$28,500,000
Flood (100-year)	85	425	\$127,500,000	52	\$15,600,000
Flood (500-year)	145	425	\$127,500,000	89	\$26,700,000
Snow Load (vulnerable)	730	425	\$127,500,000	68	\$3,400,000
Severe Winter Weather	730	425	\$127,500,000	425	\$12,750,000



Vulnerable Populations

The Town of Fairplay's vulnerable populations include:

- Elderly residents (approximately 8-10% of population) who may have difficulty with winter conditions, evacuation, or maintaining homes during extreme weather
- Low-income households (approximately 7% below poverty line) with limited resources for emergency preparedness, heating costs, or property mitigation
- Limited-English speaking residents with limited understanding of plans, lack of awareness of available assistance, and multiple communication barriers
- Residents of historic structures along Front Street and older residential areas lacking modern building standards for snow load and fire resistance
- Seasonal workers and tourists unfamiliar with high-altitude hazards and extreme weather conditions
- Medical patients dependent on Park County South Park Health Service District during emergencies
- School children requiring safe shelter and transportation during hazard events
- County jail inmates requiring secure shelter and emergency management
- Residents in the wildland-urban interface on the western hillside with limited evacuation routes
- Employees of county, state, municipal government and businesses who must maintain operations during emergencies

Capability Assessment

Table 197. Capability Assessment: Town of Fairplay

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Emergency Management (coordinated with Park County) ☒ Planning Department ☒ Building/Zoning
Technical	☒ GIS / Mapping (Town has its own GIS system) ☒ Engineering (Town Engineer) ☒ Floodplain Management
Financial	☒ General Budget ☒ FEMA Grants ☒ Other Grants: DOLA, CWCB, CDPHE
Legal / Policy Tools	☒ Zoning Ordinance ☒ Building Codes (IBC/IRC adopted) ☒ Subdivision Regulations ☒ Floodplain Ordinance ☒ Comprehensive Plan (Update coming in 2026)
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Enhance Warning and Notification Capabilities	



Capability Area	Available Resources / Programs (Check all that apply)
	• Expand partnerships and MOU's • Explore additional grant funding opportunities

National Flood Insurance Program Compliance

NFIP Participation Status

The Town of Fairplay participates in the National Flood Insurance Program (NFIP). The town adopted floodplain regulations and joined the NFIP to allow property owners to purchase flood insurance and to qualify for federal disaster assistance. The town enforces floodplain development standards and maintains coordination with FEMA for flood mapping updates and compliance.

Number of Policies and Repetitive Loss Properties

Table 198. Policies and Repetitive Loss Properties: Town of Fairplay

Category	2015	2025
Policies	12	18
Number of Repetitive Loss Structures	0	1

Floodplain Management Regulations and Enforcement

The Town of Fairplay enforces floodplain management regulations through its building permit and development review process. The town requires all development in designated flood hazard areas to comply with NFIP standards including elevation requirements, floodproofing, and restrictions on critical facilities. The Town Administrator serves as the floodplain administrator and coordinates with its contract engineering firm of SGM as well as Park County for technical assistance. Regulations are enforced through building inspections and certificates of occupancy.

Substantial Improvements and Substantial Damages

As part of participation in the National Flood Insurance Program (NFIP), the town of Fairplay enforces substantial improvement and substantial damage requirements through local floodplain management ordinances. These provisions ensure that when structures in the Special Flood Hazard Area (SFHA) are substantially improved, reconstructed, or suffer damage equal to or exceeding 50 percent of their market value, they must be brought into compliance with current floodplain regulations. Currently, no countywide recordkeeping system exists that aggregates substantial improvement and substantial damage determinations across NFIP communities; however, local floodplain administrators report that these determinations are made on a case-by-case basis through the permitting and inspection process. Following flood events, building inspectors and emergency management personnel conduct damage assessments to identify



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structures that may trigger substantial damage determinations. Future mitigation actions may include improving the consistency of substantial improvement and substantial damage documentation and integrating it with local permitting systems to better track post-flood compliance and elevation requirements.

CRS (Community Rating System) Participation

The Town of Fairplay does not currently participate in the Community Rating System. The town is evaluating CRS participation to provide reduced flood insurance premiums for property owners and to formalize existing flood mitigation activities.

Integration with Other Plans

Table 199. Planning Documents: Town of Fairplay

Planning Documents	Status
Emergency Operations Plan	Coordinated through Park County EOP
Comprehensive Emergency Management Plan	Coordinated through Park County
Community Wildfire Protection Plan	Currently being updated
Continuity of Operations Pan	Adopted 2022
Floodplain Regulations	Adopted 2022 (NFIP compliant)
Zoning Regulations (Unified Development Code)	Adopted 2015 (Will be updated in 2026)
Subdivision Regulations	Adopted
Comprehensive Land Use Plan	Adopted 2013 (Will be Updated in 2026)
Natural Resources Protection Plan	None
Economic Development Plan	Park County Tourism strategic plan (2020)
Historic Preservation Plan	South Park City preservation plan (Unified Development Code – Town Center Design Standards)
Farmland Preservation Plan	N/A (coordinated at county level)
Building Codes	IBC/IRC 2018 adopted
Fire Codes	IFC 2018 adopted



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Mitigation Strategy

Table 200. Mitigation Actions: Town of Fairplay

Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
F-1: Flood Warning System	Provide early warning for flood events	Install stream gauges and automated flood warning system on South Platte River and tributaries with community notification	Flooding	Town/County	\$85,000	1-2	FEMA PDM, CWCB	High	Structure & Infrastructure
F-2: Critical Facility Backup Power	Maintain operations during power outages	Install/upgrade backup generators at Town Hall, Public Works, Water Treatment, and Community Center	Winter Storm, All Hazards	Town of Fairplay	\$180,000	1-3	FEMA HMGP, DOLA EIAF	High	Structure & Infrastructure
F-3: Wildfire Mitigation Program	Reduce wildfire risk to structures	Implement community-wide defensible space program, fuel reduction	Wildfire	Town/Fire District	\$95,000	1-4	CSFS Grants, FEMA	High	Natural Systems Protection



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		on western hillside interface, and fire-resistant landscaping standards							
F-4: Snow Load Building Assessment	Identify and address vulnerable structures	Conduct comprehensive structural assessment of commercial and public buildings for snow load capacity; develop retrofit program	Winter Weather	Town of Fairplay	\$45,000	1-2	Town Budget, DOLA	High	Local Plans & Regulations
F-5: Stormwater Master Plan	Improve drainage and reduce flood risk	Develop comprehensive stormwater management master plan identifying drainage improvements, detention needs, and culvert upgrades	Flooding	Town of Fairplay	\$55,000	1-2	CWCB, Town Budget	High	Local Plans & Regulations
F-6: Water System	Prevent freeze	Upgrade water distribution	Extreme Cold	Town of	\$250,000	2-4	DOLA EIAF, USDA	High	Structure & Infrastr



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Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
Winterization	- related failures	system with enhanced insulation, heat trace, and monitoring systems for extreme cold protection		Fairplay					Structure
F-7: Historic District Fire Protection	Protect historic structures from fire	Enhance fire protection in Front Street historic district including hydrant improvements, fire breaks, and sprinkler incentive program	Wildfire, Structure Fire	Town/Fire District	\$175,000	2-4	State Historical Fund, FEMA	Medium	Structure & Infrastructure
F-8: Emergency Communication System	Improve emergency notifications	Upgrade emergency notification system including outdoor warning sirens, CodeRED expansion, and social media integration	All Hazards	Town/County	\$65,000	1-3	FEMA EMPG, Town Budget	Medium	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
F-9: Hazard Public Education	Increase community preparedness	Develop comprehensive public education program covering winter preparedness, flood safety, wildfire awareness, and emergency planning	All Hazards	Town of Fairplay	\$15,000	1-2	Town Budget, FEMA	Medium	Public Education
F-10: Bridge Vulnerability Assessment	Identify and prioritize bridge improvements	Conduct engineering assessment of bridges for flood and debris flow vulnerability; develop retrofit and replacement priorities	Flooding	Town/County/CDOT	\$35,000	1-2	CDOT, FEMA PDM	Medium	Local Plans & Regulations
F-11: CWPP Development	Formalize wildfire planning	Develop Community Wildfire Protection Plan specific to Fairplay area in coordination with county CWPP	Wildfire	Town/Fire/CSFS	\$30,000	1-2	CSFS, FEMA	Medium	Local Plans & Regulations



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
F-12: Drainage Infrastructure Improvements	Reduce localized flooding	Upgrade undersized culverts and drainage infrastructure based on stormwater master plan priorities	Flooding	Town of Fairplay	\$450,000	3-5	CWCB, FEMA FMA	Medium	Structure & Infrastructure
F-13: Floodplain Mapping Update	Improve flood risk understanding	Partner with FEMA and CWCB to update Flood Insurance Rate Maps with current conditions and climate projections	Flooding	Town/County/FEMA	\$75,000	2-4	FEMA CTP, CWCB	Low	Local Plans & Regulations
F-14: Emergency Shelter Enhancement	Improve shelter capacity	Enhance emergency shelter capabilities at schools and community center with supplies, backup systems, and accessibility improvements	All Hazards	Town/Schools	\$40,000	2-3	FEMA EMPG, Red Cross	Low	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
F-15: Hazmat Response Equipment	Improve hazmat incident response	Acquire hazmat response equipment and training for fire district to address Highway 285 incidents	Hazardous Materials	Fire District/ County	\$55,000	2-4	FEMA AFG, HMEP	Low	Structure & Infrastructure

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Janell Sciacca **Title:** Town Administrator

Email: jsciacca@fairplayco.us **Phone:** 719-836-2622

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☒ Community surveys
☒ Trustee meetings ☒ Other: Coordination with fire district, schools, and county departments, as well as State of Colorado; review after hazard events

The Town of Fairplay will monitor and implement this Hazard Mitigation Plan through:

- Annual review by Town Board of Trustees and Town Administrator during budget planning cycle
- Quarterly coordination meetings with Park County Emergency Management and South Park Northwest Fire Protection District
- Integration of mitigation actions into Capital Improvement Plan and annual budget process
- Regular coordination with county departments, schools, healthcare facilities, and other stakeholders
- Progress reports presented at Town Board meetings with public participation opportunities
- Review and update following any significant hazard event affecting Fairplay or Park County
- Community surveys conducted every two years to assess hazard awareness and preparedness levels



Park County Hazard Mitigation Plan 2025

- Participation in Park County Emergency Management planning updates and regional exercises
- Coordination with state and federal agencies for grant opportunities and technical assistance
- Five-year Regular comprehensive plan updates in coordination with Park County's HMP update cycle
- Integration with comprehensive plan development, zoning updates, and building code enforcement
- Annual training for town staff on hazard mitigation plan implementation and emergency procedures



Lake George Fire Protection District

The Lake George Fire Protection District (LGFPD) serves approximately 250 square miles in eastern Park County, Colorado. LGFPD also serves as mutual aid to western Teller County, Colorado. The district encompasses diverse terrain including portions of Pike National Forest, the South Platte River Basin, Eleven Mile Canyon Reservoir, Badger Flats, Lost Creek Wilderness and numerous communities along U.S. Highway 24. The district serves an estimated population of 2,800 residents, with significant seasonal increases due to recreation and tourism. LGFPD operates as a volunteer department with 30+ volunteer firefighters, 1 career firefighter, and 4 stations strategically located throughout the district. The district faces significant wildfire risk due to extensive forest coverage, limited water supply for firefighting, challenging terrain, and the wildland-urban interface. Other hazards include severe winter weather, flooding along waterways, and emergency medical incidents in remote locations. LGFPD coordinates closely with Park County Emergency Management, neighboring fire districts, U.S. Forest Service, and state agencies for mutual aid, training, and hazard mitigation.

Jurisdiction Profile

Lake George Fire Protection District provides fire suppression, wildland firefighting, emergency medical services, rescue, and hazardous materials response across 250 square miles of mountainous and forested terrain. The district includes the communities of Lake George, Tarryall, Eleven Mile, portions of Florissant (as mutual aid), and numerous subdivisions and rural residences. Elevations range from approximately 8,500 to 10,000 feet. The district is characterized by ponderosa pine and mixed conifer forests, grasslands, river corridors, and dispersed residential development. Major recreation areas include Eleven Mile State Park, Badger Flats, Lost Creek Wilderness, and Eleven Mile Canyon. These attractions bring thousands of visitors annually. The district's volunteer force responds to an average of 230 calls per year. Primary hazards include wildfire, winter storms, medical emergencies in remote locations, and water rescue incidents.

Table 201. Table of Facts: Lake George Fire Protection District

Category	Details
Land Area	250 square miles
Incorporated Village(s)	Lake George, Tarryall, Eleven Mile, portions of Florissant, multiple subdivisions
Population Census	~2,800 permanent residents; 5,000+ seasonal
Governance	Special District - Board of Directors
Highest Elevation	8,500 - 10,000 feet
Largest Lake	Eleven Mile Reservoir, Tarryall Reservoir
River(s)	South Platte River and tributaries
Dams	Eleven Mile Dam, Tarryall Reservoir



Park County Hazard Mitigation Plan 2025

Category	Details
Number of Fire Stations	4
Interstate Highway	None
State Routes	US Hwy 24, County Roads
Forest Land	Extensive- Pike National Forest
Land Classified Residential	Rural residential, subdivisions
Hospital/Medical Facility	None in district (Fairplay, Woodland Park)
Career Firefighters	1
Volunteer Firefighters	30+
Schools	Lake George Charter School
Railroads	Historic (no active service)
Major Employer	Colorado Parks & Wildlife, Tourism/Recreation, Lake George Charter School
Law Enforcement	Park County Sheriff, Teller County Sheriff (as mutual aid)
Average Annual Calls	230+
Power Utility Provider(s)	CORE Electric, Colorado Natural Gas
Water Supply Source(s)	Individual wells
Emergency Shelters	Lake George Community Center, Lake George Charter School
Critical Facilities	4 Fire stations, Communication Sites

Planning Process

Lake George Fire Protection District actively participated in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process as a critical stakeholder in emergency response and wildfire mitigation. The district participated in hazard identification surveys, planning meetings with Park County Emergency Management, and dedicated Hazard Mitigation Planning sessions. Fire district leadership reviewed hazard assessments specific to wildfire risk, resource needs for emergency response, and infrastructure vulnerabilities. The district coordinated input from volunteer firefighters with operational experience responding to incidents throughout the 250-square-mile service area. Meeting attendees included the Fire Chief, Board members, and volunteers. The district worked closely with Park County Emergency Management, Colorado State Forest Service, U.S. Forest Service, and neighboring fire districts to ensure comprehensive planning and mutual aid coordination.



Hazards and Risk Summary

Summary of Past Hazard

Table 202. Historical Hazards: Lake George Fire Protection District

Date	Event	Description
June 2002	Hayman Fire	Largest fire in Colorado history (138,000 acres) started near Lake George; LGFPD heavily involved in response; demonstrated critical wildfire vulnerability.
December 2006	Holiday Blizzard	Major blizzard isolated communities; emergency response severely hampered; multiple rescue calls.
Summer 2012	Wildfire Season	High wildfire activity statewide; LGFPD on high alert; multiple small and three large wildland fires contained.
September 2013	Flooding	Regional flooding impacted South Platte drainage; water rescues and road closures.
2016	Flood – Dam Release	Prolonged severe winter conditions; extended response times; equipment challenges.
Winter 2019	Extended Winter	Regional fire caused smoke impacts; heightened wildfire concerns; public education efforts.
Summer 2020	Cameron Peak Fire	Grassfire grew to 1,047 acres; evacuations ordered for County Road 403 area, Wilson Lakes, and Forest Glenn subdivisions; multi-agency response; demonstrated need for rapid response capabilities.
March 2023	403 Fire	Regular medical emergencies, water rescues, and vehicle accidents at Eleven Mile, Badger Flats and Lost Creek Wilderness; remote location challenges.
Ongoing	Recreation Incidents	Largest fire in Colorado history (138,000 acres) started near Lake George; LGFPD heavily involved in response; demonstrated critical wildfire vulnerability.



Significant Hazards

Table 203. Hazards: Lake George Fire Protection District

Hazard Ranking	Hazard
High Hazards	Wildfire, Severe Winter Weather, Medical Emergency (remote)
Medium Hazards	Flooding, Drought, Water Rescue, Structure Fire
Low Hazards	Dam Failure, Hazmat Incident, Earthquake, Lightning

Hazard Specific Vulnerabilities

Wildfire: Wildfire is the highest risk hazard for LGFPD. The district contains extensive ponderosa pine forests, mixed conifer stands, and grasslands with significant fuel loads. The 2002 Hayman Fire demonstrated catastrophic wildfire potential. Wildland-urban interface development throughout the district creates defensible space challenges. Limited water supply for firefighting (no hydrants in most areas) hampers suppression capabilities. Steep terrain, remote access, and long response distances create operational challenges. The district has numerous subdivisions with limited evacuation routes. Drought conditions increase fire danger. Recreation use creates ignition risks. Wind events can cause rapid fire spread.

Severe Winter Weather: The district experiences heavy snowfall, extreme cold, and high winds during winter months. Winter storms can close Highway 24 and county roads, isolating communities and limiting emergency response. Heavy snow loads impact structures. Extended cold affects water systems and equipment. Ice on reservoirs creates rescue hazards. Volunteer availability may decrease during severe weather. Medical emergencies in remote areas become more critical when transport times increase.

Medical Emergency (Remote): Medical emergencies in remote locations present significant challenges. Transport times to hospitals in Woodland Park or Colorado Springs can exceed 45 minutes. Many residences are accessed by unpaved roads that may be impassable during winter or wet conditions. Limited cell phone coverage hampers emergency communications. Aging population with medical needs. Recreation injuries at reservoirs and forest areas. Helicopter response can be limited due to weather conditions.

Flooding: South Platte River and tributaries pose flood risk during spring runoff and summer thunderstorms. Flash flooding in narrow canyons can trap recreationists and residents. Bridge and culvert failures can isolate areas. Eleven Mile Canyon is particularly vulnerable to flash flooding. Post-wildfire flooding and debris flows increase risk in burned areas.

Water Rescue: Eleven Mile Reservoir, Eleven Mile Canyon and Tarryall Creek attract thousands of boaters, anglers, and recreationists annually. Cold water temperatures, wind-generated waves, and sudden weather changes create rescue scenarios. Ice rescue situations occur during winter. Limited rescue equipment and training for water/ice rescue increase vulnerability.



Structure Fire: Rural residential structures are vulnerable to fire. Limited water supply makes structure fire suppression challenging. Long response distances allow fires to grow. Many structures use wood heat creating chimney fire risks. Older recreational cabins may lack modern fire protection. Mutual aid response times are extended.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 204. Facilities & Infrastructure Assessment: Lake George Fire Protection District

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Fire Station #1 (Main)	Wildfire, Winter Storm	No	No	Partial	No
Fire Station #2	Wildfire, Winter Storm	No	No	Partial	No
Fire Station #3	Wildfire Winter Storm	No	No	Partial	No
Fire Station #4	Wildfire, Winter Storm	No	No	Partial	No
Lake George Charter School	Wildfire, Winter Storm	No	No	Yes	Partial
Lake George Community Center	Wildfire	No	No	Partial	No
Eleven Mile State Park	Wildfire, Flood	Partial	Minor	Partial	Yes
Communication Towers	Wildfire, Lightning, Wind	No	No	Yes	Yes
US Highway 24 Bridges	Flood	Yes	No	Yes	N/A
Eleven Mile Dam	Dam Failure	N/A	No	Yes	N/A
Water Storage Tanks (Fire)	Freeze, Wildfire	No	No	Partial	N/A



Potential Loss

Table 205. Potential Loss: Lake George Fire Protection District

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High Risk)	85,000	1,200	\$420,000,000	480	\$168,000,000
Wildfire (Moderate Risk)	75,000	1,200	\$420,000,000	240	\$84,000,000
Flood (100-year)	3,500	1,200	\$420,000,000	65	\$22,750,000
Severe Winter Weather	160,000	1,200	\$420,000,000	1,200	\$21,000,000
Structure Fire (annual)	N/A	1,200	\$420,000,000	8	\$2,800,000

Vulnerable Populations

Lake George Fire Protection District's vulnerable populations include:

- Elderly residents (significantly higher percentage than state average) with limited mobility or medical needs requiring timely emergency response
- Remote rural residents with limited access during winter storms or wildfire events
- Residents along single-access roads with no alternative evacuation routes
- Seasonal residents unfamiliar with wildfire evacuation procedures and winter survival
- Recreationists and tourists at Eleven Mile reservoirs, Eleven Mile Canyon, Lost Creek Wilderness and Badger Flats unfamiliar with area hazards
- Lower-income households (10% below poverty line) with limited resources for emergency preparedness or property mitigation
- Residents dependent on well water in areas without fire hydrants or water supply for firefighting
- People with disabilities or special medical needs in remote locations
- Children attending Lake George Charter School requiring emergency shelter and care
- Residents in older structures lacking defensible space or fire-resistant construction
- Households without landline phones in areas with poor cell coverage



Capability Assessment

Table 206. Capability Assessment: Lake George Fire Protection District

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Fire Chief ☒ Board of Directors ☒ Emergency Management (through Park County)
Technical	☒ GIS / Mapping (through County/CSFS) ☒ Engineering (contracted when needed) ☒ Wildfire Assessment (CSFS Support) ☒ Fire Prevention Officer
Financial	☒ District Mill Levy ☒ FEMA Grants (AFG, SAFER, HMGP) ☒ State Grants (DFPC, VFA) ☒ Other Grants: CSFS, DOLA
Operational	☒ Structure Fire Suppression ☒ Wildland Firefighting ☒ Emergency Medical Services ☒ Technical Rescue (limited) ☒ Water Rescue (limited equipment) ☒ Hazmat Awareness Level
Mutual Aid	☒ Automatic Aid Agreements ☒ COFIRE (Colorado Fire Service Mutual Aid System) ☒ U.S. Forest Service Coordination ☒ Regional Fire Coordination
Equipment	☒ Structure Engines (3) ☒ Wildland Engines/Brush Trucks ☒ Water Tenders ☐ Ambulance ☒ Utility Vehicles ☐ Aerial Apparatus ☒ Adequate water rescue equipment
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Expand partnerships and MOU's • Explore additional grant funding opportunities	

National Flood Insurance Program Compliance

NFIP Participation Status

Lake George Fire Protection District is a special district providing emergency services and does not have regulatory authority over floodplain management. NFIP participation and floodplain management are handled at the county level by Park County. The fire district coordinates with county floodplain administrators (and Denver Water) for flood response planning and provides input on flood hazard areas during emergency planning.



Park County Hazard Mitigation Plan 2025

Number of Policies and Repetitive Loss Properties

Table 207. Policies and Repetitive Loss Properties: Lake George Fire Protection District

Category	2015	2025
Policies	--	--
Number of Repetitive Loss Structures	--	--

Floodplain Management Regulations and Enforcement

Lake George Fire Protection District is a special district providing emergency services and therefore looks to the surrounding jurisdiction for floodplain regulations and enforcement.

CRS (Community Rating System) Participation

Lake George Fire Protection District is a special district providing emergency services and therefore does not participate in CRS.

Integration with Other Plans

Table 208. Planning Documents: Lake George Fire Protection District

Planning Documents	Status
Emergency Operations Plan	District EOP adopted; coordinated with County
Standard Operating Procedures	Maintained and updated regularly
Wildland Fire Response Plan	Adopted, coordinates with USFS
Community Wildfire Protection Plan	Participates in Park County CWPP; district-specific annexes (currently being updated) and Teller County CWPP
Evacuation Plans	Developed for high-risk subdivisions
Mutual Aid Agreements	Active with all neighboring districts
Training Plan	Annual training requirements established
Strategic Plan	5-year strategic plan (updated 2023)
Capital Improvement Plan	Maintained, updated annually
Fire Prevention Programs	Defensible space inspections, public education
Pre-Fire Plans	Developed for critical facilities and high hazards



Park County Hazard Mitigation Plan 2025

Mitigation Strategy

Table 209. Mitigation Actions: Lake George Fire Protection District

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
LG-1: Wildland Fire Engine	Improve initial attack wildfire suppression	Acquire Type 3 or Type 6 wildland engine for rapid wildfire response with off-road capability	Wildfire	LGFPD	\$350,000	1-2	FEMA AFG, VFA, District funds	High	Structure & Infrastructure
LG-2: Water Tender	Provide water supply for remote fires	Acquire water tender (3,000+ gallon) to support structure and wildland fire operations in areas without hydrants	Structure Fire, Wildfire	LGFPD	\$425,000	2-3	FEMA AFG, VFA	High	Structure & Infrastructure
LG-3: Station Defensible Space	Protect fire stations from wildfire	Implement comprehensive defensible space	Wildfire	LGFPD	\$45,000	1	CSFS, VFA, District	High	Natural Systems Protection



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		and fuel reduction around all three fire stations							
LG-4: Backup Power Systems there are 4 stations none have generators	Maintain operations during power outages	Install/up grade backup generators at Stations 1, 2, 3, and 4; improve fuel storage	Winter Storm, All Hazards	LGFPD	\$85,000	1-2	FEMA HMGP, District	High	Structure & Infrastructure
LG-5: Community Wildfire Education	Increase wildfire awareness and preparedness	Expand public education program including annual wildfire workshops, evacuation planning, defensible space assistance, and Firewise Community recognition	Wildfire	LGFPD/CSFS	\$15,000	Ongoing	CSFS, VFA, District	High	Public Education



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
LG-6: Radio Communication Upgrade	Improve emergency communications	Upgrade to digital radio system compatible with county and regional systems; add repeater coverage in dead zones	All Hazards	LGFPD/County	\$95,000	1-3	FEMA EMPG, County, District	High	Structure & Infrastructure
LG-7: Water Rescue Equipment	Improve water and ice rescue capability This has been addressed. New gear and annual training	Acquire water rescue equipment including boat, personal flotation, ice rescue gear, and provide specialized training	Water Rescue	LGFPD	\$55,000	1-2	FEMA AFG, Parks & Wildlife, District	Medium	Structure & Infrastructure
LG-8: Wildfire Pre-Plans	Improve wildfire response efficiency	Develop detailed wildfire pre-plans for high-risk subdivisions including	Wildfire	LGFPD	\$20,000	1-2	CSFS, District	Medium	Local Plans & Regulations



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		access routes, water sources, evacuation procedures, and structure protection priorities							
LG-9: Volunteer Recruitment	Maintain adequate staffing levels	Implement comprehensive volunteer recruitment and retention program including incentives, training opportunities, and equipment	All Hazards	LGFPD	\$35,000	Ongoing	FEMA SAFER, VFA, District	Medium	Public Education
LG-10: Station Weather Protection	Protect equipment from winter damage	Upgrade station heating systems, insulation, and weatherproofing to protect apparatus and	Winter Storm, Extreme Cold	LGFPD	\$65,000	2-3	District funds, DOLA	Medium	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		equipment during extreme cold							
LG-11: Fuel Reduction Projects	Reduce wildfire fuel loads	Implement strategic fuel reduction projects in high-priority areas near communities and along evacuation routes	Wildfire	LGFPD/CSFS/USFS	\$150,000	2-5	CSFS, USFS, County, District	Medium	Natural Systems Protection
LG-12: Emergency Access Improvements	Improve emergency vehicle access	Work with county and subdivisions to improve emergency access including road width, turnarounds, bridge load ratings, and signage	All Hazards	LGFPD/County	\$200,000	3-5	County, DOLA, Subdivisions	Medium	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
LG-13: Firefighter Training	Maintain qualified firefighters	Provide ongoing training in wildland firefighting, structure protection, and safety including S-130/190, Firefighter I/II, and specialized rescue	All Hazards	LGFPD	\$25,000	Ongoing	FEMA AFG, VFA, District	Low	Public Education
LG-14: Evacuation Route Signage	Improve evacuation efficiency	Install comprehensive evacuation route signage in high-risk subdivisions with multiple exit routes clearly marked	Wildfire	LGFPD/County	\$18,000	1-2	County, DOLA, District	Low	Public Education
LG-15: Apparatus Replacement Plan	Maintain reliable emergency response fleet	Develop and implement long-term apparatus	All Hazards	LGFPD Board	Planning only	1	District planning	Low	Local Plans & Regulations



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		Replacement schedule ensuring adequate, reliable equipment							

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Susan Bernstetter **Title:** Fire Chief/ Emergency Management Coordinator

Email: Susan@lakegeorgefire.com **Phone:** 719-748-3022

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Board meetings ☒ Other: Monthly department meetings, incident reviews, coordination with CSFS and USFS, training drills

Lake George Fire Protection District will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Fire Chief and Board of Directors during strategic planning and budget development
- Monthly department meetings to assess mitigation action progress and adjust priorities based on operational needs
- Quarterly coordination meetings with Park County Emergency Management and neighboring fire districts
- Integration of mitigation actions into Capital Improvement Plan, grant applications, and annual budget
- Regular coordination with Colorado State Forest Service for wildfire mitigation projects and Firewise Community support
- Coordination with U.S. Forest Service for fuel reduction projects on federal lands
- Review and update of pre-fire plans and emergency procedures following significant incidents or near-miss events
- Annual wildfire season preparedness review and equipment readiness checks



Park County Hazard Mitigation Plan 2025

- Participation in Park County emergency management planning, training exercises, and regional coordination meetings
- After-action reviews following significant incidents to identify lessons learned and needed improvements
- Community feedback through public education events, board meetings, and social media engagement
- Grant progress reporting to funding agencies with documentation of mitigation outcomes
- Five-year comprehensive plan update in coordination with Park County's HMP update cycle
- Annual firefighter training reviews to ensure adequate preparedness for identified hazards
- Equipment maintenance and replacement tracking to ensure operational readiness



North-West Fire Protection District

The North-West Fire Protection District (NWFPD) was founded in 1882 and serves approximately 289 square miles (184,970 acres) in northwestern Park County, Colorado, at elevations of 9,500 feet and above. The district includes the communities of Fairplay (the county seat) and Alma (the highest incorporated town in North America at 10,578 feet elevation). NWFPD operates from two fire stations: Station 1 in Alma (believed to be the highest operational fire station in North America) and Station 2 in Fairplay. The district serves a permanent population of approximately 6500 residents, with a more than 100% population increase during summer months due to second-home residents, recreation, and events. The district's service area includes Pike National Forest lands and several large subdivisions with significant wildland-urban interface risk adjacent to forest boundaries. Major transportation routes include U.S. Highway 285 (a designated military route) and Colorado Highway 9. NWFPD provides all-hazard emergency services including structure fire suppression, wildland firefighting, and coordinates with South Park Ambulance District for emergency medical services.

Jurisdiction Profile

North-West Fire Protection District provides comprehensive emergency services across high-altitude mountainous terrain in northwestern Park County. The district encompasses the historic mining communities of Fairplay (county seat at 9,953 feet) and Alma (at 10,578 feet, the highest incorporated town in North America). The service area includes numerous mountain valleys, peaks over 13,000 feet in the Mosquito Range (including Mount Bross, Mount Lincoln, and Mount Democrat), creek drainages, former mining districts, and extensive Pike National Forest lands. The district's extreme elevation presents unique operational challenges including reduced apparatus performance, altitude effects on personnel, severe weather conditions, and extended winter seasons. Summer population doubles due to recreation, tourism, and seasonal residents. The district coordinates closely with South Park Ambulance District (ALS transport), Park County Emergency Management, Colorado State Forest Service, U.S. Forest Service, and neighboring fire districts for mutual aid and regional emergency response.

Table 210. Table of Facts: North-West Fire Protection District

Category	Details
Land Area	289 square miles (184,970 acres)
Communities Served	Fairplay (county seat), Alma (highest town in North America)
Population Served	6,500 permanent; doubles in summer
Governance	Special District (Park County District 4) - Board
Elevation Range	9,500 - 14,000+ feet
Highest Peak	Mount Lincoln (14,286 feet)
River(s)	South Platte River (Middle Fork), Buckskin Creek
Founded	1882 (one of oldest in Colorado)



Park County Hazard Mitigation Plan 2025

Category	Details
Number of Fire Stations	2 (Alma Station 1, Fairplay Station 2)
State Routes	US Highway 285 (military route), CO Highway 9
Federal Land	Pike National Forest (portions)
Historic Mining	Extensive - 17,452+ mining sites
Land Use	Rural residential, WUI, forest, historic mining
Hospital/Medical Facility	HRRMC South Park Health Care
Staffing	Career
Schools	South Park Schools in Fairplay
Law Enforcement	Park County Sheriff's Office
Ambulance Service	South Park Ambulance District (ALS)
Power Utility	IREA/ Xcel
Water Supply	Town systems, individual wells
Emergency Shelters	Schools, Community Center, Fire Stations, Park County Fair Grounds
Critical Facilities	2 Fire Stations, County Courthouse, Schools

Planning Process

North-West Fire Protection District participated actively in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process. As the district serving both Fairplay (county seat) and Alma (highest town), NWFPD's input was essential for understanding hazards affecting the northwestern portion of Park County. The district participated in hazard identification surveys, multiple planning meetings with Park County Emergency Management, and dedicated Hazard Mitigation Planning sessions. District leadership assessed wildfire risks in the extensive wildland-urban interface, infrastructure vulnerabilities at extreme elevation, operational challenges of high-altitude response, and coordination with county government services in Fairplay. The planning process included review of historical incident data, analysis of wildfire behavior modeling for forested areas, assessment of structure fire risks in historic communities, and evaluation of winter weather impacts on emergency response. Meeting participants included the Fire Chief, and coordination with Fairplay and Alma town officials. The district worked closely with Park County Emergency Management, South Park Ambulance District, Colorado State Forest Service, and neighboring fire districts to ensure comprehensive planning and seamless mutual aid coordination.



Hazards and Risk Summary

Summary of Past Hazard

Table 211. Historical Hazards: North-West Fire Protection District

Date	Event	Description
October 1996	Buffalo Creek Fire	Major fire in adjacent area; NWFPD provided mutual aid; increased awareness of regional wildfire risk.
December 2006	Holiday Blizzard	Massive blizzard buried Fairplay and Alma; Highway 285 closed; extended isolation; multiple emergency calls; snow removal overwhelmed.
Summer 2012	High Wildfire Season	Statewide drought; multiple small wildland fires in district; heightened preparedness and public education.
September 2013	Flooding	Heavy rainfall caused localized flooding; road damage in Fairplay and surrounding areas.
Winter 2014	Extended Cold Period	Multiple weeks of -20°F to -30°F temperatures; apparatus and equipment challenges; water system concerns.
March 2016	Structure Fire	Major structure fire in Alma; demonstrated water supply challenges at high elevation; mutual aid critical.
Summer 2020	Regional Wildfire Smoke	Cameron Peak and other fires caused extended poor air quality; respiratory issues; tourism impacts.
Winter 2021	Roof Collapse	Heavy snow load caused commercial building roof collapse in Fairplay; demonstrated snow load vulnerability of older structures.
Ongoing	Altitude Medical Emergencies	Regular altitude sickness cases among tourists; cardiac events; requires rapid assessment and transport decisions.



Significant Hazards

Table 212. Hazards: North-West Fire Protection District

Hazard Ranking	Hazard
High Hazards	Wildfire, Severe Winter Weather, Structure Fire
Medium Hazards	Flooding, Medical Emergency (altitude), Drought, Extreme Cold
Low Hazards	Hazmat Incident, Lightning, Earthquake, Mine Subsidence

Hazard Specific Vulnerabilities

Wildfire: Wildfire poses significant risk to NWFPD despite the relatively open South Park basin. The district includes forested areas, timbered slopes on surrounding mountains, and extensive wildland-urban interface development. Subdivisions on hillsides west and north of Fairplay and around Alma are at elevated risk. Historic structures in downtown Fairplay and Alma with wood construction increase fire spread potential. Limited water supply for firefighting in outlying areas hampers suppression. Pine beetle kill in forested areas has increased fuel loads. Wind events common in South Park can cause rapid fire spread. Drought conditions elevate risk. The district coordinates with Pike National Forest but jurisdictional boundaries complicate response. Highway 285 creates ignition risk from vehicles and discarded smoking materials.

Severe Winter Weather: Both Fairplay and Alma experience extreme winter conditions. Fairplay at nearly 10,000 feet and Alma at 10,578 feet receive heavy snowfall (150-200+ inches annually), severe cold (regularly -20°F to -30°F), and dangerous winds. Highway 285 closures can isolate the communities. County roads become impassable. Snow load on historic structures and commercial buildings is a major concern. Apparatus performance degrades in extreme cold and high altitude. Water supply for firefighting can freeze. Extended cold affects water distribution systems. Medical emergencies become critical with limited transport options. The district's role serving the county seat means government operations must continue.

Structure Fire: Structure fire risk is elevated due to several factors: historic wood-frame structures in Fairplay and Alma, wood heat use creating chimney fire risk, limited water supply in some areas, high altitude reducing apparatus pump performance, and potential for rapid fire spread in older downtown areas. Fairplay's Front Street historic district contains numerous wood structures. Alma's historic buildings date to the 1870s. Rural residential structures lack fire hydrants. Mutual aid response times are extended.

Flooding: The Middle Fork of the South Platte River and Buckskin Creek pose flood risk during spring runoff and summer thunderstorms. Low-lying areas of Fairplay near the river are vulnerable. Alma sits at the confluence of Buckskin Creek and the Middle Fork, creating flood potential. Flash flooding from summer storms can cause localized damage. Historic mining impacts on drainage patterns may increase flood risk. Bridge and culvert capacity is a concern during high flows.



Medical Emergency (Altitude): The extreme elevations of Fairplay (9,953 feet) and especially Alma (10,578 feet) create unique medical challenges. Altitude sickness affects tourists and new residents. Cardiac and respiratory emergencies are complicated by altitude. Reduced oxygen levels stress cardiovascular systems. Response times to definitive care are extended—nearest hospitals are in Fairplay (basic) or require transport to Denver-area facilities (2+ hours). Helicopter operations are affected by altitude and weather. Winter conditions complicate evacuations.

Drought: Extended drought conditions impact water supply for firefighting, increase wildfire danger, and stress municipal water systems. Water availability for structure protection becomes critical. Drought affects vegetation, making it more flammable.

Extreme Cold: Winter temperatures regularly drop to -20°F to -40°F. Extreme cold affects apparatus reliability, reduces firefighter effectiveness, freezes water lines, and creates hypothermia risks. Equipment performance degrades significantly at high altitude and extreme cold combined.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 213. Facilities & Infrastructure Assessment: North-West Fire Protection District

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Fire Station 1 (Alma)	Wildfire, Extreme Cold	No	No	Partial	Yes
Fire Station 2 (Fairplay)	Wildfire, Snow Load	No	No	Yes	Yes
Park County Courthouse	Snow Load, Fire	No	No	Partial	Yes
South Park Schools	Snow Load, Wildfire	No	No	Yes	Partial
Park County Health Clinic	Snow Load	No	No	Yes	Yes
Alma Town Hall	Extreme Cold	No	No	Yes	Limited
Fairplay Water Treatment	Freeze, Flood	No	Minor	Yes	Yes
Alma Water System	Freeze	No	No	Yes	Limited



Potential Loss

Table 214. Potential Loss: North-West Fire Protection District

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High/Moderate)	45,000	950	\$332,500,000	190	\$66,500,000
Flood (100-year)	2,800	950	\$332,500,000	85	\$29,750,000
Severe Winter Weather	184,970	950	\$332,500,000	950	\$16,625,000
Snow Load (vulnerable)	184,970	950	\$332,500,000	120	\$6,000,000
Structure Fire (annual avg)	N/A	950	\$332,500,000	6	\$2,100,000

Vulnerable Populations

North-West Fire Protection District's vulnerable populations include:

- Elderly residents (particularly in Alma) with medical conditions complicated by extreme altitude and limited access to care
- Tourists and visitors unaccustomed to high altitude experiencing acute mountain sickness, cardiac stress, or respiratory distress
- New residents unfamiliar with extreme winter conditions and altitude effects
- Low-income households (approximately 4-7%) with limited resources for emergency preparedness or property improvements
- Residents of historic structures in Fairplay's Front Street district and Alma's downtown lacking modern fire protection
- People with cardiovascular or respiratory conditions affected by altitude and cold
- Seasonal workers in tourism/recreation sectors unfamiliar with hazards
- County jail inmates requiring secure shelter and medical care during emergencies
- School children requiring safe shelter and care during extended emergencies
- County employees who must maintain government operations during severe weather
- Residents in wildland-urban interface areas west and north of Fairplay with limited evacuation routes
- Elderly living alone in remote areas during winter



- Recreational users (hikers, climbers, 14er enthusiasts) on surrounding peaks experiencing altitude or weather emergencies

Capability Assessment

Table 215. Capability Assessment: North-West Fire Protection District

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Fire Chief ☒ Board of Directors ☒ Career Staff ☒ Emergency Management (Park County)
Technical	☒ GIS / Mapping (through County/CSFS) ☐ Engineering (contracted as needed) ☒ Wildfire Assessment (CSFS) ☒ Fire Prevention
Financial	☒ District Mill Levy ☒ FEMA Grants (AFG, HMGP) ☒ State Grants (DFPC, VFA) ☒ Other: CSFS, DOLA
Operational	☒ Structure Fire Suppression ☒ Wildland Firefighting ☒ Vehicle Extrication ☒ Coordinates with South Park Ambulance (ALS) ☒ Hazmat Awareness
Mutual Aid	☒ Automatic Aid Agreements ☒ COFIRE mutual aid system ☒ Regional fire coordination ☒ USFS coordination
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Expand partnerships and MOU's • Explore additional grant funding opportunities	

National Flood Insurance Program Compliance

NFIP Participation Status

North-West Fire Protection District is a special district providing emergency services and does not have regulatory authority over floodplain management or land use. NFIP participation and floodplain management are handled by Park County and the incorporated towns of Fairplay and Alma. The fire district coordinates with these jurisdictions for flood response planning and provides operational input on flood hazard areas based on emergency response experience.

Number of Policies and Repetitive Loss Properties

Table 216. Policies and Repetitive Loss Properties: North-West Fire Protection District

Category	2015	2025
Policies	--	--
Number of Repetitive Loss Structures	--	--



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Floodplain Management Regulations and Enforcement

North-West Fire Protection District is a special district providing emergency services and therefore looks to the surrounding jurisdiction for floodplain regulations and enforcement.

CRS (Community Rating System) Participation

North-West Fire Protection District is a special district providing emergency services and therefore does not participate in CRS.

Integration with Other Plans

Table 217. Planning Documents: North-West Fire Protection District

Planning Documents	Status
Emergency Operations Plan	District EOP; coordinated with County
Standard Operating Procedures	Comprehensive SOPs maintained
Wildland Fire Response Plan	Adopted; coordinates with USFS/CSFS
Community Wildfire Protection Plan	Participates in Park County CWPP; district-specific annexes (currently being updated)
Evacuation Plans	Developed for WUI subdivisions
Mutual Aid Agreements	Active with all adjacent districts
Training Plan	Annual training requirements
Strategic Plan	Multi-year plan maintained
Capital Improvement Plan	Maintained, updated annually
Fire Prevention Programs	Defensible space, inspections, education
Pre-Fire Plans	Critical facilities and high hazards
High-Altitude Operations SOPs	Specialized procedures for extreme elevation



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Mitigation Strategy

Table 218. Mitigation Actions: North-West Fire Protection District

Project # & Name	Goal / Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High / Medium / Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
NW-1: Structure Engine Replacement	Maintain reliable structure protection	Replacing Type 1 structure engine with modern apparatus rated for high-altitude operation	Structure Fire, All Hazards	NWFPD	\$650,000	1-2	FEMA AFG, VFA, District	High	Structure & Infrastructure
NW-2: Station 1 Winterization	Protect equipment at extreme elevation	Upgrade Alma station (highest in North America) with enhanced heating, insulation, and cold-weather equipment protection systems	Extreme Cold, Winter Storm	NWFPD	\$120,000	1-2	FEMA HMGP, District, DOLA	High	Structure & Infrastructure
NW-3: Wildfire Mitigation Program	Reduce WUI wildfire risk	Comprehensive defensible space program for subdivisions	Wildfire	NWFPD /CSFS	\$95,000	1-4	CSFS, VFA, County	High	Natural Systems Protection



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Project # & Name	Goal / Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High / Medium / Low)	Mitigation Technique Category
		ns west and north of Fairplay; fuel reduction on interface; Firewise Communities							
NW-4: Historic District Fire Protection	Protect historic structures	Enhance fire protection in Fairplay Front Street and Alma historic districts: hydrant improvements, pre-plans, fire breaks, sprinkler incentives	Structure Fire	NWFPD /Towns	\$150,000	2-4	State Historical Fund, FEMA, Towns	High	Structure & Infrastructure
NW-5: Emergency Communication Upgrade	Improve emergency communications	Upgrade radio system to digital P25; improve coverage between Fairplay and Alma; station alerting improvements	All Hazards	NWFPD /County	\$85,000	1-3	FEMA EMPG, County, District	High	Structure & Infrastructure



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Project # & Name	Goal / Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High / Medium / Low)	Mitigation Technique Category
NW-6: Snow Load Assessment Program	Identify vulnerable structures	Conduct structural assessments of commercial and public buildings in Fairplay and Alma for snow load capacity; develop retrofit priorities	Winter Weather	NWFPD /Towns	\$35,000	1-2	Towns, County, DOLA	Medium	Local Plans & Regulations
NW-7: Public Wildfire Education	Increase community preparedness	Expand education program: annual workshops, Home Ignition Zone assessments, evacuation planning, Ready-Set-Go program	Wildfire	NWFPD /CSFS	\$18,000	Ongoing	CSFS, VFA, District	Medium	Public Education
NW-8: High-Altitude Operations Training	Improve firefighter effectiveness	Specialized training for high-altitude operations: fitness standards, altitude acclimatization	All Hazards	NWFPD	\$25,000	Ongoing	FEMA AFG, VFA, District	Medium	Public Education



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Project # & Name	Goal / Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High / Medium / Low)	Mitigation Technique Category
		ation, cold weather operations, equipment adaptation							
NW-9: Water Supply Enhancement	Improve firefighting water supply	Add dry hydrants, draft sites, and cisterns in areas without municipal water; improve existing hydrant systems	Structure Fire, Wildfire	NWFPD / Towns	\$175,000	2-5	VFA, Towns, County, District	Medium	Structure & Infrastructure
NW-11: Evacuation Route Improvements	Improve evacuation capability	Work with county and towns to improve evacuation routes from WUI subdivisions; signage; secondary access; turnarounds	Wildfire, All Hazards	NWFPD / County/ Towns	\$125,000	3-5	County, Towns, DOLA	Low	Structure & Infrastructure
NW-12: Pre-Fire Planning	Improve response efficiency	Develop detailed pre-plans for all critical facilities, historic	Structure Fire	NWFPD	\$15,000	1-2	VFA, District	Low	Local Plans & Regulations



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Project # & Name	Goal / Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High / Medium / Low)	Mitigation Technique Category
		structures, and high-hazard occupancies in Fairplay and Alma							
NW-13: Cold Weather Equipment	Maintain operations in extreme cold	Acquire specialized cold-weather equipment: heated hose lines, insulated gear, apparatus warming systems, cold-rated tools	Extreme Cold	NWFPD	\$45,000	2-3	FEMA AFG, District	Low	Structure & Infrastructure
NW-14: Wildland Engine	Enhance wildland fire capability	Acquire Type 6 wildland engine for initial attack on interface fires near subdivisions	Wildfire	NWFPD	\$250,000	3-5	FEMA AFG, VFA, USFS	Low	Structure & Infrastructure
NW-15: Apparatus Replacement Plan	Maintain reliable fleet	Develop 20-year apparatus replacement schedule accounting for high-altitude wear and	All Hazards	NWFPD Board	Planning only	1	District planning	Low	Local Plans & Regulations



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Project # & Name	Goal / Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High / Medium / Low)	Mitigation Technique Category
		extreme weather impacts							

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Kerry Olme **Title:** Fire Chief

Email: chief@nwfpd.org **Phone:** 719-836-3150

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Board meetings ☒ Other: Monthly officer meetings, coordination with Fairplay and Alma town officials, incident reviews, seasonal preparedness reviews

North-West Fire Protection District will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Fire Chief, Career staff, and Board of Directors during strategic planning and budget development cycle
- Monthly officer meetings to assess mitigation action progress, operational readiness, and equipment status for extreme conditions
- Quarterly coordination meetings with Park County Emergency Management, South Park Ambulance District, and neighboring fire districts
- Integration of mitigation actions into Capital Improvement Plan, grant applications, annual budget, and equipment replacement schedules
- Regular coordination with Colorado State Forest Service for wildfire mitigation, defensible space programs, and Firewise Community support
- Coordination with Fairplay and Alma town officials for integrated hazard planning, historic preservation, and infrastructure improvements
- Coordination with Park County government for county-wide emergency planning and continuity of operations
- After-action reviews following significant incidents to identify lessons learned, equipment needs, and operational improvements
- Annual wildfire season preparedness review including apparatus checks, water supply verification, WUI subdivision planning, and evacuation procedures
- Winter preparedness review including cold-weather equipment testing, station winterization verification, Highway 285 coordination, and isolation planning



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- Specialized high-altitude operations reviews to address unique challenges of operating at 9,500-10,578 feet elevation
- Community feedback through public education events, town meetings, board meetings, and coordination with local businesses
- Grant progress reporting to funding agencies with documentation of outcomes and expenditures
- Five-year comprehensive plan update in coordination with Park County's HMP update cycle
- Annual training reviews to ensure personnel readiness for structure fire, wildland fire, high-altitude operations, and cold weather response
- Equipment maintenance tracking accounting for accelerated wear from altitude and extreme weather conditions
- Coordination with historic preservation organizations for protection of Fairplay and Alma's historic resources



Platte Canyon Fire Protection District

Platte Canyon Fire Protection District (PCFPD) was formed as a volunteer organization in 1947 and established as a special district in 1980. The district serves approximately 271 square miles across Northern Park County, along the North Fork of the South Platte River corridor. The district's service area stretches from Kenosha Pass in the south to near Conifer in the north, encompassing the communities of Bailey (the largest unincorporated community in Park County), Grant, Shawnee, Webster, and numerous mountain subdivisions. PCFPD serves an estimated population of 8,000-10,000 residents with seasonal increases from recreation and second-home use. The district operates as a combination department with approximately 20 career firefighters/paramedics, 4 volunteer firefighters, and a dedicated 10-member wildland fire crew. Four strategically located stations provide coverage. The district provides full-service emergency response including fire suppression, advanced life support emergency medical services (10 EMT-Basics, 6 person fuels crew, 9 Paramedics), technical rescue, swift water and ice rescue, vehicle extrication, and hazardous materials response. The district has an excellent ISO rating of 4 for much of its coverage area. PCFPD's territory includes extensive wildland-urban interface with dense forest coverage, steep terrain, and limited water supply presenting significant wildfire risk.

Jurisdiction Profile

Platte Canyon Fire Protection District serves the mountainous corridor along the North Fork South Platte River from Kenosha Pass northward to the Jefferson County line. The district encompasses Bailey, the largest unincorporated community in Park County and a key commercial center for the region. Bailey is located approximately 45 miles southwest of Denver along U.S. Highway 285, a major transportation corridor connecting Denver to South Park and mountain recreation areas. The district includes portions of Pike National Forest, Mount Evans Wilderness, Lost Creek Wilderness, and numerous residential subdivisions. Elevations range from approximately 7,600 feet to over 12,000 feet. The area is characterized by dense ponderosa pine and lodgepole pine forests, steep terrain, narrow mountain valleys, and the North Fork South Platte River. PCFPD responded to the devastating 1996 Buffalo Creek Fire which burned 12,000 acres just south of the district boundary and demonstrated the catastrophic wildfire potential in the region. The district maintains a dedicated 10-person wildland fire crew and coordinates extensively with the U.S. Forest Service. The district is a key participant in Fire Adapted Bailey; a coalition focused on wildfire preparedness and works closely with five active Firewise Communities.



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Table 219. Table of Facts: Platte Canyon Fire Protection District

Category	Details
Land Area	271 square miles (Park & Jefferson Counties)
Communities Served	Bailey (largest), Grant, Shawnee, Webster, numerous subdivisions
Population Served	~8,000-10,000 residents; higher seasonally
Governance	Special District - Board of Directors
Established	Volunteer 1947, District 1980
Elevation Range	7,600 - 12,000+ feet
Major Highway	U.S. Highway 285 (main corridor)
River	North Fork South Platte River
Number of Fire Stations	4 stations
Federal Land	Pike National Forest, Mount Evans & Lost Creek Wilderness
Land Use	Residential WUI, commercial (Bailey), forest, recreation
Medical Facility	None
Career Firefighter/Medics	~20 (10 EMT-B, 2 EMT-I, 9 Paramedics)
Volunteer Firefighters	4
Wildland Fire Crew	10 members (dedicated crew), 6 fuels/mitigation crew
Schools	Platte Canyon High School, elementary schools
ISO Rating	4 (much of district - excellent for mountain area)
Law Enforcement	Park County Sheriff, Jefferson County Sheriff
Power Utility	Core, Colorado Natural Gas
Water Supply	Small water districts, individual wells, local ponds/rivers
Emergency Shelters	Schools, Fire Stations, Community Centers
Critical Facilities	4 Fire Stations, Schools, Roberts Tunnel
Firewise Communities	5 active communities

Planning Process

Platte Canyon Fire Protection District participated comprehensively in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process. As the district serving Bailey and the most populated area of northern Park County, PCFPD's participation was essential for understanding wildfire risk, emergency medical service needs, and infrastructure vulnerabilities along the critical Highway 285 corridor. The district participated in all planning phases including hazard identification surveys, multiple



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planning meetings with Park County Emergency Management, and dedicated Hazard Mitigation Planning sessions. District leadership conducted detailed assessments of wildfire risks throughout the extensive wildland-urban interface, identified critical infrastructure needs, and evaluated emergency medical service capabilities given the district's robust ALS program. The planning process included review of lessons learned from the 1996 Buffalo Creek Fire, analysis of wildfire behavior modeling, assessment of response capabilities across 271 square miles, and coordination with Fire Adapted Bailey coalition partners. Meeting participants included the Fire Chief, Assistant Chiefs, career staff, volunteer leadership, wildland crew supervisors, Board members, and representatives from the Coalition for the Upper South Platte and Fire Adapted Bailey. The district coordinated closely with Park County Emergency Management, U.S. Forest Service South Platte Ranger District, Colorado State Forest Service, neighboring fire districts (Elk Creek and Jefferson/Como), and the five active Firewise Communities to ensure comprehensive regional wildfire planning.

Hazards and Risk Summary

Summary of Past Hazard

Table 220. Historical Hazards: Platte Canyon Fire Protection District

Date	Event	Description
May 1996	Buffalo Creek Fire	12,000-acre fire just north of district; PCFPD heavily involved in response; 2 fatalities; demonstrated catastrophic wildfire potential and post-fire flood risk.
July 1996	Buffalo Creek Flood	Post-fire debris flow and flooding killed 2; massive destruction; demonstrated post-fire flood hazard.
September 2006	Platte Canyon High School Shooting	Hostage situation at high school; 1 student killed; demonstrated need for active shooter response capabilities.
December 2006	Holiday Blizzard	Major blizzard closed Highway 285; communities isolated; multiple emergency calls; resource strain.
Summer 2012	High Wildfire Season	Statewide drought; multiple wildland fires; extended pre-positioning of resources; high alert status.
September 2013	Regional Flooding	Heavy rainfall caused flooding on North Fork South Platte; road damage; evacuations; swift water rescues.
Winter 2019	Extended Winter	Prolonged severe conditions; Highway 285 frequently closed;



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		increased medical emergencies; volunteer response challenges.
Summer 2020	Regional Wildfire Smoke	Cameron Peak and other fires caused extended poor air quality; respiratory emergencies; visitor impacts.
Ongoing	Highway 285 Incidents	Regular vehicle accidents, extrications, and medical emergencies on major transportation corridor; high-speed crashes.
Ongoing	River Recreation Incidents	Swift water rescues, drownings, and injuries on North Fork South Platte; ice rescue incidents in winter.

Significant Hazards

Table 221. Hazards: Platte Canyon Fire Protection District

Hazard Ranking	Hazard
High Hazards	Wildfire, Severe Winter Weather, Vehicle Accident/Extrication, Medical Emergency
Medium Hazards	Flooding, Structure Fire, Swift Water Rescue, Drought
Low Hazards	Hazmat Incident, Dam Failure, Avalanche, Lightning

Hazard Specific Vulnerabilities

Wildfire: Wildfire is the highest priority hazard for PCFPD. The 1996 Buffalo Creek Fire, which burned 12,000 acres just south of the district and killed two firefighters, demonstrated the catastrophic potential. The district contains extensive wildland-urban interface with dense lodgepole pine and ponderosa pine forests, steep terrain, and hundreds of homes interspersed in forested areas. Pine beetle kill has dramatically increased fuel loads. Limited water supply for firefighting (few hydrants in outlying areas) hampers suppression. Narrow, winding roads limit access and egress. Many subdivisions have limited evacuation routes. The North Fork South Platte River corridor creates a natural fire path. Winds funneling through mountain valleys can cause rapid fire spread. Post-fire flooding and debris flows present secondary hazards. The district maintains a dedicated 10-person wildland crew and coordinates closely with USFS, but the scale of potential fires could overwhelm local resources. Five active Firewise Communities provide some mitigation, but much work remains.



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Severe Winter Weather: Winter storms frequently close Highway 285, the district's main artery, isolating Bailey and other communities from metro Denver. Heavy snowfall, extreme cold, and high winds are common. Snow load affects structures. Kenosha Pass and other high points become impassable. Medical emergencies become critical when transport times to Denver-area hospitals are extended or impossible. Ice on roads causes numerous accidents. Volunteer response may be limited during severe weather. Equipment performance degrades. Water systems can freeze.

Vehicle Accident/Extrication: U.S. Highway 285 is a high-traffic corridor connecting Denver to mountain communities and ski resorts. High-speed crashes, head-on collisions, commercial vehicle accidents, and wildlife strikes are frequent. The highway is steep and winding through the district. Winter conditions increase crash frequency. Extrication capabilities are essential. County roads are narrow and twisty with rollover risks. Motorcycle crashes in summer are common. The district's robust ALS program is critical for trauma care.

Medical Emergency: PCFPD provides advanced life support with paramedics staffing ambulances. Medical emergencies range from routine to critical trauma. Transport times to St. Anthony's or Denver hospitals can be 45+ minutes under good conditions, much longer during winter or Highway 285 closures. Aging population with cardiac and stroke risks. Recreation injuries (hiking, biking, rafting).

Flooding: The North Fork South Platte River and tributaries pose flood risk during spring runoff and summer thunderstorms. The 1996 post-Buffalo Creek Fire flood demonstrated the catastrophic potential of post-fire debris flows. Flash flooding in narrow canyons threatens structures and roads. Highway 285 crosses multiple drainages vulnerable to washout. Culverts and bridges can fail. Properties near waterways are at risk. Future wildfires will create enhanced flood risk downstream.

Structure Fire: Rural residential and commercial structures in Bailey and surrounding areas are vulnerable. Wood construction, wood heat (chimney fires), limited water supply in outlying areas, and long response distances in remote areas create risks. The excellent ISO 4 rating reflects good capabilities in core areas, but outlying properties have limited protection. Mutual aid is essential for working structure fires.

Swift Water Rescue: The North Fork South Platte River attracts kayakers, rafters, and anglers. High spring runoff creates dangerous conditions. Drownings and rescues occur regularly. Ice rescue incidents happen in winter. The district maintains swift water rescue capabilities and equipment. Cold water temperatures create hypothermia risk.



Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 222. Facilities & Infrastructure Assessment: Platte Canyon Fire Protection District

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Station 2 (Bailey - Main)	Wildfire	No	No	Yes	Yes
Station 1	Wildfire, Flood	Partial	No	Partial	Limited
Station 3	Wildfire	No	No	Partial	No
Station 4	Wildfire	No	No	Partial	No
Platte Canyon High School	Wildfire, Snow Load	No	No	Yes	Yes
Elementary Schools	Wildfire	No	No	Partial	Partial
Bailey Silverheels Health Center	Wildfire	No	No	Yes	Yes
Highway 285 Corridor	Wildfire, Flood, Winter	Partial	Yes	Partial	N/A
Highway 285 Bridges	Flood	Yes	No	Yes	N/A
Communication Towers	Wildfire, Lightning	No	No	Yes	Yes
Water Treatment Systems	Wildfire, Freeze	No	No	Partial	Limited
Commercial District (Bailey)	Wildfire, Structure Fire	No	No	Partial	N/A



Potential Loss

Table 223. Potential Loss: Platte Canyon Fire Protection District

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High Risk)	110,000	3,800	\$1,330,000,000	1,520	\$532,000,000
Wildfire (Moderate Risk)	63,000	3,800	\$1,330,000,000	760	\$266,000,000
Flood (100-year)	8,500	3,800	\$1,330,000,000	380	\$133,000,000
Post-Fire Flood	15,000	3,800	\$1,330,000,000	570	\$199,500,000
Severe Winter Weather	173,440	3,800	\$1,330,000,000	3,800	\$66,500,000
Structure Fire (annual avg)	N/A	3,800	\$1,330,000,000	15	\$5,250,000

Vulnerable Populations

- Platte Canyon Fire Protection District's vulnerable populations include:
- School children at Platte Canyon High School and elementary schools requiring safe shelter, evacuation, and care (2006 shooting demonstrated vulnerability)
- Elderly residents with limited mobility, medical needs, and difficulty evacuating independently during wildfire or winter emergencies
- Residents of remote subdivisions with single-access roads and limited evacuation options during wildfire
- Lower-income households with limited resources for wildfire mitigation, emergency preparedness, or property improvements
- Residents dependent on well water in areas without fire hydrants or water supply for firefighting
- Seasonal residents and tourists unfamiliar with wildfire evacuation procedures and mountain driving hazards
- People with disabilities or special medical needs requiring extended transport times to definitive care
- Highway 285 travelers during winter storms or wildfire evacuations
- River recreationists (kayakers, rafters, anglers) at risk for swift water incidents
- Residents in structures lacking defensible space or fire-resistant construction



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- Mountain bikers and hikers in wilderness areas at risk for injuries requiring technical rescue
- Residents of areas at risk for post-fire flooding (learned from 1996 Buffalo Creek experience)

Capability Assessment

Table 224. Capability Assessment: Platte Canyon Fire Protection District

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Fire Chief ☒ Assistant Chiefs ☒ Board of Directors ☒ Career Staff (~20) ☒ Emergency Management (Park County)
Technical	☒ GIS / Mapping (County/CSFS) ☐ Engineering (contracted) ☒ Wildfire Assessment (CSFS/Fire Adapted Bailey) ☒ Fire Prevention
Financial	☒ District Mill Levy (14.294 mills) ☒ FEMA Grants (AFG, SAFER, HMGP) ☒ State Grants (DFPC, VFA) ☒ Other: CSFS, USFS, DOLA
Operational	☒ Structure Fire Suppression ☒ Wildland Firefighting (dedicated 10-person crew) ☒ Advanced Life Support EMS (Paramedics) ☒ Swift Water/Ice Rescue ☒ Technical Rescue ☒ Vehicle Extrication ☒ Hazmat Awareness
EMS Capabilities	☒ 10 EMT-Basics ☒ 9 Paramedics ☒ ALS Ambulances
Mutual Aid	☒ Automatic Aid Agreements ☒ COFIRE mutual aid system ☒ Elk Creek FPD coordination ☒ Jefferson/Como FPD coordination ☒ U.S. Forest Service coordination
Equipment	☒ Type 1 Engines (structure) ☒ Type 3/6 Engines (wildland) ☒ Water Tenders ☒ Brush Trucks ☒ ALS Ambulances ☒ Swift Water Rescue Equipment ☒ Extrication Equipment
Community Programs	☒ Fire Adapted Bailey Coalition ☒ 5 Active Firewise Communities ☒ Public Education Programs ☒ School Fire Safety Education
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Expand partnerships and MOU's • Explore additional grant funding opportunities	

National Flood Insurance Program Compliance

NFIP Participation Status

Platte Canyon Fire Protection District is a special district providing emergency services and does not have regulatory authority over floodplain management or land use. NFIP participation and floodplain management are handled at the county level by Park County and Jefferson County.



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The fire district coordinates with county floodplain administrators for flood response planning, provides operational input on flood hazard areas based on emergency response experience, and maintains swift water rescue capabilities. The district is acutely aware of post-fire flood risks following the 1996 Buffalo Creek Fire experience.

Number of Policies and Repetitive Loss Properties

Table 225. Policies and Repetitive Loss Properties: Platte Canyon Fire Protection District

Category	2015	2025
Policies	--	--
Number of Repetitive Loss Structures	--	--

Floodplain Management Regulations and Enforcement

Platte Canyon Fire Protection District is a special district providing emergency services and therefore looks to the surrounding jurisdiction for floodplain regulations and enforcement.

CRS (Community Rating System) Participation

Platte Canyon Fire Protection District is a special district providing emergency services and therefore does not participate in CRS.

Integration with Other Plans

Table 226. Planning Documents: Platte Canyon Fire Protection District

Planning Documents	Status
Emergency Operations Plan	District EOP adopted; coordinated with Counties
Standard Operating Procedures	Comprehensive SOPs maintained and updated
Wildland Fire Response Plan	Adopted; coordinates with USFS and CSFS
Community Wildfire Protection Plan	Participates in Park County CWPP; district-specific annexes (currently being updated); Fire Adapted Bailey
Evacuation Plans	Developed for high-risk subdivisions
Mutual Aid Agreements	Active with all adjacent districts
Training & Certification Plan	Annual training for all disciplines
Strategic Plan	Multi-year strategic plan maintained
Capital Improvement Plan	Maintained, updated annually
Fire Prevention Programs	Defensible space, inspections, education



Park County Hazard Mitigation Plan 2025

Planning Documents	Status
Pre-Fire Plans	Schools, critical facilities, commercial
EMS Protocols	ALS protocols under medical direction
Active Shooter Plan	Developed following 2006 school incident
Fire Adapted Bailey Plans	Coalition participant; 5 Firewise Communities

Mitigation Strategy

Table 227. Mitigation Actions: Platte Canyon Fire Protection District

Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
PC-1: Wildland Fire Crew Equipment	Enhance wildland crew capabilities	Upgrade equipment for 10-person wildland crew: modern gear, tools, communications, vehicles	Wildfire	PCFPD	\$350,000	1-2	FEMA AFG, VFA, USFS, District	High	Structure & Infrastructure
PC-2: Type 3 Wildland Engine	Improve initial attack	Acquire Type 3 wildland engine for rapid response to interface fires in subdivisions	Wildfire	PCFPD	\$450,000	1-2	FEMA AFG, VFA, USFS	High	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
PC-3: Fire Adapted Bailey Expansion	Increase community wildfire preparedness	Expand Fire Adapted Bailey coalition activities: additional Firewise Communities, home assessments, fuel reduction, education	Wildfire	PCFPD /Fire Adapted Bailey	\$125,000	1-5	CSFS, VFA, Coalition partners	High	Public Education
PC-4: Strategic Fuel Reduction	Reduce wildfire fuel loads	Large-scale fuel reduction projects prioritizing evacuation routes, community protection zones, Highway 285 corridor	Wildfire	PCFPD /CSFS/ USFS	\$750,000	3-5	CSFS, USFS, County, Coalition	High	Natural Systems Protection
PC-5: Emergency Communication Upgrade	Improve emergency communications	Upgrade to digital P25 system; improve coverage in canyons; enhance interoperability with USFS and	All Hazards	PCFPD /Counties	\$200,000	1-3	FEMA EMPG, Counties, District	High	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		adjacent districts							
PC-6: Ambulance Replacement	Maintain ALS capabilities	Replacing ALS ambulance with modern unit; maintain paramedic-level care capabilities	Medical Emergency, All Hazards	PCFPD	\$350,000	2-3	FEMA AFG, District	High	Structure & Infrastructure
PC-7: Station Generator Systems	Maintain operations during outages	Install/upgrade backup generators at Stations 1, 3, and 4; fuel storage; automatic transfer	Winter Storm, All Hazards	PCFPD	\$180,000	1-3	FEMA HMGP, District	Medium	Structure & Infrastructure
PC-8: Evacuation Route Improvements	Improve evacuation capability	Work with counties to improve evacuation routes from subdivisions: road widening, secondary access, signage, turnarounds	Wildfire, All Hazards	PCFPD /Counties	\$400,000	3-5	Counties, DOLA, Subdivisions	Medium	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
PC-9: Swift Water Rescue Equipment	Enhance river rescue capability	Upgrade swift water rescue equipment: boats, personal flotation, ice rescue gear, rope systems, specialized training	Swift Water Rescue	PCFPD	\$75,000	1-2	FEMA AFG, District	Medium	Structure & Infrastructure
PC-10: Water Supply Enhancement	Improve firefighting water supply	Develop additional water sources: cisterns, dry hydrants, draft sites, water storage in high-risk subdivisions	Structure Fire, Wildfire	PCFPD	\$250,000	2-5	VFA, Counties, Subdivisions	Medium	Structure & Infrastructure
PC-11: Wildfire Pre-Plans	Improve response efficiency	Develop detailed wildfire pre-plans for all subdivisions: structure priorities, water sources, access, safety zones, evacuation triggers	Wildfire	PCFPD	\$40,000	1-2	CSFS, VFA, District	Medium	Local Plans & Regulations



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
PC-12: School Emergency Planning	Enhance school safety	Update emergency plans for all schools: wildfire evacuation, active shooter, shelter-in-place, medical emergencies; regular drills	All Hazards	PCFPD /Schools	\$25,000	1-2	School District, County	Medium	Local Plans & Regulations
PC-13: Firefighter Training	Maintain qualified personnel	Ongoing training: S-130/190/219 wildland, Firefighter I/II, paramedic continuing ed, swift water, technical rescue	All Hazards	PCFPD	\$50,000	Ongoing	FEMA AFG, VFA, District	Low	Public Education
PC-14: Volunteer Recruitment	Maintain adequate staffing	Comprehensive volunteer program: recruitment campaigns, retention incentives, training opportunities	All Hazards	PCFPD	\$60,000	Ongoing	FEMA SAFER, VFA, District	Low	Public Education



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		es, equipment							
PC-15: Apparatus Replacement Plan	Maintain reliable fleet	Develop 20-year apparatus replacement schedule for all engines, ambulances, support vehicles	All Hazards	PCFPD Board	Planning only	1	District planning	Low	Local Plans & Regulations

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Ben Mulligan **Title:** Fire Chief

Email: Ben.mulligan@plattecanyonfire.com **Phone:** 303-838-5853

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Board meetings (2nd Tuesday monthly) ☒ Other: Fire Adapted Bailey coalition meetings, officer meetings, incident reviews, wildland crew debriefs, Firewise Community coordination

Platte Canyon Fire Protection District will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Fire Chief, Assistant Chiefs, and Board of Directors at regular monthly board meeting (2nd Tuesday)
- Monthly officer and staff meetings to assess mitigation action progress, operational readiness, and adjust priorities based on seasonal hazards
- Quarterly coordination meetings with Park County and Jefferson County Emergency Management and neighboring fire districts
- Integration of mitigation actions into Capital Improvement Plan, grant applications, annual budget, and strategic planning
- Regular coordination with Colorado State Forest Service for wildfire mitigation projects and defensible space programs



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- Active participation in Fire Adapted Bailey coalition meetings and activities to coordinate community-wide wildfire preparedness
- Coordination with five active Firewise Communities to support and expand neighborhood-level mitigation efforts
- Coordination with U.S. Forest Service South Platte Ranger District for fuel reduction projects, operating plans, and wildland fire response
- After-action reviews following significant incidents to identify lessons learned, equipment needs, and operational improvements
- Annual wildfire season preparedness review for wildland crew, apparatus, water supply, evacuation plans, and pre-fire plans
- Winter preparedness review including EMS capabilities during Highway 285 closures, apparatus winterization, and volunteer availability
- Wildland crew debriefs following deployments to capture lessons learned and identify training or equipment needs
- Community feedback through Fire Adapted Bailey events, Firewise Community meetings, public education programs, and social media
- Grant progress reporting to funding agencies with documentation of mitigation outcomes and expenditures
- Five-year comprehensive plan update in coordination with Park County's and Jefferson County's HMP update cycles
- Annual training reviews for all disciplines: structure fire, wildland fire, EMS, swift water rescue, and technical rescue
- Equipment maintenance tracking and apparatus replacement planning for full fleet including specialty equipment
- School emergency planning coordination and regular drill participation
- Lessons learned reviews from 1996 Buffalo Creek Fire to inform ongoing wildfire and post-fire flood planning



Hartsel Fire Protection District

Hartsel Fire Protection District (HFPD) was formed in 1956 by five Hartsel residents as a volunteer fire department and incorporated as a special district in 1970. The district serves approximately 753 square miles across Park County, Colorado, making it one of the largest fire districts by area in the state. HFPD serves an estimated 6,000 permanent residents plus numerous seasonal property owners and visitors who come to enjoy South Park's stunning mountain valley, reservoirs, and fishing opportunities. The district is headquartered in Hartsel, a small ranching community known as 'The Heart of Colorado' due to its location at the geographic center of the state. The service area encompasses the southern portion of the South Park basin, stretching from Wilkerson Pass to Trout Creek Pass and including major recreation areas such as Antero Reservoir, Spinney Mountain Reservoir, and Eleven Mile Reservoir. The district operates six strategically located stations with 8 career firefighters, 22 volunteers, and 1 civilian staff member. HFPD is an all-hazards district providing fire suppression, wildland firefighting, emergency medical services (coordinated with South Park Ambulance District), technical rescue, hazardous materials response, swift water rescue, surface water rescue, and vehicle extrication across extremely remote and challenging terrain.

Jurisdiction Profile

Hartsel Fire Protection District serves the vast southern South Park basin, one of Colorado's four large intermountain parks. The service area is characterized by high-altitude grassland prairie (average elevation 9,000 feet) surrounded by mountain ranges, including the Mosquito Range to the west and the Front Range to the east. The district includes Hartsel at the junction of U.S. Highway 24 and Colorado Highway 9, plus numerous ranches, subdivisions including Ranch of the Rockies and South Park Ranches, and extensive public lands. The South Platte River flows through the district, feeding three major reservoirs: Antero Reservoir (built 1909, first dam on South Platte), Spinney Mountain Reservoir (Gold Medal fishery), and Eleven Mile Reservoir (largest in area). These water bodies attract over 500,000 recreation visitors annually for fishing, boating, camping, and wildlife viewing.

The district is extremely rural with low population density, long distances between properties, limited infrastructure, minimal water supply for firefighting, and harsh weather, including severe winter conditions and high winds. Mutual aid is essential, but response times from neighboring districts are extended due to distances. The district coordinates with Park County Emergency Management, South Park Ambulance District, U.S. Forest Service, and neighboring fire districts for comprehensive emergency coverage.



Park County Hazard Mitigation Plan 2025

Table 228. Table of Facts: Hartsel Fire Protection District

Category	Details
Land Area	~753 square miles (Park County)
Communities Served	Hartsel, Garo, Antero Junction, numerous ranches and subdivisions
Population Served	~6,000 permanent residents; significant seasonal increase
Governance	Special District- Board of Directors
Established	Volunteer 1956, Incorporated District 1970
Elevation Range	8,600-11,000+ feet
Average Basin Elevation	9,000ft (High-altitude grassland)
Major Highways	US Highway 24, US Highway 285, Colorado Highway 9
River	South Platte River (headwaters region)
Major Reservoirs	Antero, Spinney Mountain, Eleven Mile
Number of Fire Stations	6
Federal Land	Pike National Forest (portions)
State Parks	Spinney Mountain SP, Eleven Mile SP
Land Use	Ranching, recreation, residential (low density)
Historic Feature	Geographic Center of Colorado, Historic Hot Springs
Hospital/Medical Facility	None (nearest Fairplay ~30 miles)
Career Firefighters	8
Volunteer Firefighters	22
Support Staff	1 civilian
Schools	None (students to Fairplay or Lake George)
Law Enforcement	Park County Sheriff
Ambulance Service	South Park Ambulance District
Annual Recreation Visitors	~500,000 (reservoirs, fishing, hunting)
Power Utility	IREA
Water Supply	Individual wells, small ranch systems
Critical Facilities	6 Fire stations, Communication Towers



Planning Process

Hartsel Fire Protection District participated comprehensively in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process. As the largest fire district by coverage area (753 square miles) and serving the geographic center of Colorado, HFPD's input was essential for understanding hazards across the vast South Park basin. The district participated in all planning phases, including hazard identification surveys, multiple planning meetings with Park County Emergency Management, and dedicated Hazard Mitigation Planning sessions. District leadership assessed wildfire risks in grassland and forested areas, infrastructure vulnerabilities across extremely remote terrain, water supply challenges for firefighting, weather-related hazards including severe winter storms and high winds, and recreation safety issues at three major reservoirs. The planning process included review of historical incident data, analysis of response capabilities across 753 square miles with limited resources, assessment of mutual aid needs and capabilities, and coordination with state parks and federal land managers. Meeting participants included the Fire Chief, career staff member, volunteer leadership, Board members, and representatives from ranching communities and subdivisions. The district coordinated closely with Park County Emergency Management, South Park Ambulance District, Colorado State Forest Service, neighboring fire districts (North-West FPD, Jefferson-Como FPD, Lake George FPD, Southern Park County FPD), and Colorado Parks and Wildlife for comprehensive regional planning covering South Park's unique high-altitude basin environment.

Hazards and Risk Summary

Summary of Past Hazard

Table 229. Historical Hazards: Hartsel Fire Protection District

Date	Event	Description
1972	Hartsel Hot Springs Fire	Historic Hartsel Ranch hot springs hotel destroyed by fire; ended major tourist destination; demonstrated structure fire vulnerability in remote areas.
December 2006	Holiday Blizzard	Major blizzard isolated Hartsel and South Park; Highway 24 and 9 closed; multi-day isolation; multiple emergency calls; volunteer response challenged.
Summer 2012	High Wildfire Season	Statewide drought; grassland fires in South Park; rapid spread due to winds; demonstrated grassland fire risk.
March 2014	Grassland Fire	Wind-driven grassland fire threatened structures; demonstrated challenges of open terrain, high winds, limited water supply



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June 2018	Weston Pass Wildfire	13,023 acres were burnt after a dry winter, and then a lightning strike started a fire that took 16 days to contain. Closing Highway 285
Winter 2019	Extended Severe Winter	Prolonged extreme cold and heavy snow; Highway 24 frequently impassable; ranching impacts; extended isolation periods
Summer 2020	Regional Wildfire Smoke	Smoke from Cameron Peak and other fires; poor air quality for extended period; impacts to tourism and residents.
July 2021	Lightning Fires	Multiple lightning-caused fires during dry period; resource strain with concurrent incidents; mutual aid essential.
Ongoing	Highway 24/9 Accidents	Regular vehicle accidents at highways junction and along corridors; wildlife strikes; high-speed crashes; limited extrication resources.
Ongoing	Recreation Incidents	Boating accidents, drownings, medical emergencies at three major reservoirs; ice-related incidents; remote locations complicate response.
Ongoing	Ranching Emergencies	Agricultural accidents, equipment fires, livestock incidents across vast area; long response times to remote ranches.

Significant Hazards

Table 230. Hazards: Hartsel Fire Protection District

Hazard Ranking	Hazard
High Hazards	Wildfire (Grassland & Forest), Severe Winter Weather, High Wind
Medium Hazards	Medical Emergency (Remote), Drought, Extreme Cold, Recreation Emergency
Low Hazards	Flooding, Structure Fire, Lightning, Hazmat Incident



Hazard Specific Vulnerabilities

Wildfire (Grassland & Forest): Wildfire presents unique challenges in HFPD's service area. The South Park basin consists primarily of high-altitude grassland that can support rapid fire spread, especially during drought and high winds. Grassland fires can advance at incredible speeds with winds that commonly exceed 40-60 mph in South Park. Limited water supply for firefighting (no hydrants, reliance on tenders, cisterns and natural sources) hampers suppression. Forested areas on surrounding mountain slopes and near reservoirs also pose wildfire risk. Pine beetle kill has increased fuel loads in timbered areas. Subdivisions like Ranch of the Rockies are interspersed in vegetation. Long response distances mean fires can grow significantly before suppression begins. The 1972 Hartsel Hot Springs fire demonstrated structure vulnerability. Lightning is a common ignition source. Recreational users create human-caused ignition risks. Extremely low humidity and high elevation intensify fire behavior.

Severe Winter Weather: South Park experiences some of Colorado's most severe winter conditions. The high-altitude basin acts as a cold sink with temperatures regularly dropping to -20°F to -40°F. Heavy snowfall, ground blizzards, and dangerous winds are common. Highway 285, Highway 24 and Highway 9 close frequently, isolating Hartsel and the surrounding areas from Fairplay, Buena Vista, and Colorado Springs. Medical emergencies become life-threatening with no local medical facility and extended transport times. Volunteer response is challenged when members cannot reach stations. Ranching operations are disrupted. Equipment performance degrades in extreme cold and altitude. Wind chill creates hypothermia risks. The basin's open terrain offers no wind protection.

High Wind: High winds are a defining characteristic of South Park. The open basin funnels winds that regularly exceed 40-60 mph and can reach 100+ mph during severe events. Winds drive rapid wildfire spread in grasslands, create ground blizzards reducing visibility to zero, damage structures and power lines, and create hazardous driving conditions. Power outages from wind are common. The district must be prepared to operate during sustained high wind events that can last for days.

Medical Emergency (Remote): Medical emergencies in HFPD's 753 square miles present extreme challenges. No medical facility exists within the district. Many ranches and residences are 30+ minutes from stations. Highway 24 and Highway 285 closures can make transport to Fairplay (30 miles) or Buena Vista impossible. Denver and Colorado Springs-area hospitals are 2+ hours away under ideal conditions. Helicopter operations are limited by weather and altitude. Three major reservoirs attract recreation users who may be far from roads. Aging population, cardiac events, trauma, and altitude effects all occur. Coordination with South Park Ambulance is essential.

Drought: Drought affects ranching operations, increases wildfire danger in grasslands and forests, and stresses water supply for firefighting. South Park's semi-arid climate makes it vulnerable to extended dry periods. Drought conditions cause vegetation to cure early, extending the wildfire season.

Extreme Cold: South Park regularly experiences some of Colorado's coldest temperatures. The basin's high altitude (9,000 feet average) and cold air drainage create temperatures of -30°F to -40°F during winter. Extreme cold affects equipment reliability, creates frozen water supply issues, and increases medical emergencies (hypothermia, cardiac stress).



Recreation Emergency: Antero, Spinney Mountain, and Eleven Mile Reservoirs attract 500,000 annual visitors. Boating accidents, drownings, through-the-ice incidents, medical emergencies, and lost persons occur regularly. Remote locations and large water bodies complicate rescue efforts. Swift-water rescue and surface-water rescue capabilities are essential. Ice fishing incidents in winter are particularly challenging.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 231. Facilities & Infrastructure Assessment: Hartsel Fire Protection District

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Fire Station 1 (Hartsel HQ)	Wildfire, High Wind	No	No	Yes	Yes
Training Facility & Maintenance Shops	Wildfire, High Wind	No	No	Yes	No
Fire Station 2	Wildfire, Extreme Cold	No	No	Yes	No
Fire Station 3	Wildfire, Remote	No	No	Yes	No
Fire Station 4	Wildfire	No	No	Yes	Yes
Fire Station 5	Wildfire, Remote	No	No	Yes	Yes
Fire Station 7	Wildfire, Remote	No	No	Yes	Yes
Highway 24/9 Junction	Winter Storm, Wildfire	No	N/a	Partial	N/a
Highway 285/24 Junction	Winter Storm, Wildfire	No	N/a	Partial	N/a
Antero Reservoir Dam	Dam Failure	Yes	No	Yes	N/a
Spinney Mountain Dam	Dam Failure	Yes	No	Yes	N/a
Eleven Mile Dam	Dam Failure	Yes	No	Yes	N/a
Communications Towers	Lightning, High Wind	No	No	Partial	Yes



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Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Hartsel Commercial District	Wildfire, Structure Fire	No	No	Partial	N/a

Potential Loss

Table 232. Potential Loss: Hartsel Fire Protection District

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (Grassland)	350,000	1,200	\$420,000,000	180	\$63,000,000
Wildfire (Forest)	130,000	1,200	\$420,000,000	120	\$42,000,000
Severe Winter Weather	480,000	1,200	\$420,000,000	1,200	\$21,000,000
High Wind	480,000	1,200	\$420,000,000	240	\$8,400,000
Structure Fire (annual avg)	N/a	1,200	\$420,000,000	8	\$2,800,000

Vulnerable Populations

Hartsel Fire Protection District's vulnerable populations include:

- Remote ranch residents living 30+ minutes from fire stations with limited emergency services access
- Elderly residents with medical conditions requiring extended transport times to medical facilities (Fairplay 30+ miles, Buena Vista 45+ miles)
- Recreation visitors (500,000+ annually) unfamiliar with high-altitude hazards, weather extremes, and remote conditions at reservoirs
- Seasonal residents and property owners present only part-time and are unfamiliar with emergency procedures
- Lower-income households with limited resources for emergency preparedness and property protection
- Anglers and boaters at three major reservoirs at risk for drowning, hypothermia, and medical emergencies
- Ice fishers on reservoirs during winter at risk for through-the-ice incidents



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- Residents of subdivisions with limited infrastructure and fire protection (Ranch of the Rockies, South Park Ranches)
- Highway travelers during severe winter storms when Highway 24, Highway 285 and 9 close down
- Ranchers and agricultural workers at risk for equipment accidents, livestock incidents, and injuries in remote locations
- People with disabilities or special medical needs in areas with no local medical facility
- Hunters during fall season in remote areas
- Campers at dispersed sites and state park campgrounds
- Residents in areas with single access roads that can be cut off by snow or wildfire

Capability Assessment

Table 233. Capability Assessment: Hartsel Fire Protection District

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Fire Chief ☒ Board of Directors ☒ Career Staff (8) ☒ Support Staff (1 civilian) ☒ Emergency Management (Park County)
Technical	☒ GIS / Mapping (County/CSFS) ☒ Engineering (contracted) ☒ Wildfire Assessment (CSFS) ☒ Fire Prevention (burn permits, commercial building inspections, and preplans)
Financial	☒ District Mill Levy ☒ FEMA Grants (AFG, HMGP) ☒ State Grants (DFPC, VFA) ☒ Burn Permits (\$10/permit) ☒ Impact Fees ☒ Other: CSFS, DOLA
Operational	☒ Structure Fire Suppression ☒ Wildland Firefighting (Grassland & Forest) ☒ EMS (coordinates with South Park Ambulance) ☒ Technical Rescue ☒ Swift Water Rescue ☒ Surface Water Rescue ☒ Vehicle Extrication ☒ Hazmat Technicians
Mutual Aid	☒ Automatic Aid Agreements ☒ COFIRE mutual aid system ☒ Regional coordination ☒ Coordinates with CPW, USFS
Equipment	☒ Structure Engines ☒ Wildland Engines/ Grass Rigs ☒ Water Tenders ☒ Brush Trucks ☒ Rescue Equipment ☒ Swift Water/ Surface Water Rescue Equipment
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Expand partnerships and MOU's • Explore additional grant funding opportunities	



National Flood Insurance Program Compliance

NFIP Participation Status

Hartsel Fire Protection District is a special district providing emergency services and does not have regulatory authority over floodplain management or land use. NFIP participation and floodplain management are handled at the county level by Park County. The fire district coordinates with county floodplain administrators for flood response planning and dam failure emergency planning for the three major reservoirs (Antero, Spinney Mountain, and Eleven Mile) within the service area.

Number of Policies and Repetitive Loss Properties

Table 234. Policies and Repetitive Loss Properties: Hartsel Fire Protection District

Category	2015	2025
Policies	--	--
Number of Repetitive Loss Structures	--	--

Floodplain Management Regulations and Enforcement

Hartsel Fire Protection District is a special district providing emergency services and therefore looks to the surrounding jurisdiction for floodplain regulations and enforcement.

CRS (Community Rating System) Participation

Hartsel Fire Protection District is a special district providing emergency services and therefore does not participate in CRS.

Integration with Other Plans

Table 235. Planning Documents: Hartsel Fire Protection District

Planning Documents	Status
Emergency Operations Plan	District EOP; coordinated with County
Standard Operating Procedures	SOPs maintained for all operations
Wildland Fire Response Plan	Adopted; grasslands and forest protocols
Community Wildfire Protection Plan	Participates in Park County CWPP; district-specific annexes (currently being updated)
Mutual Aid Agreements	Active with neighboring districts
Training Plan	Monthly training for volunteers and career staff
Burn Permit Program	Active program per county ordinance 2021-04



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Planning Documents	Status
Dam Failure Plans	Coordinates with dam operators and CPW
State Park Coordination	MOUs with Spinney Mountain and Eleven Mile SPs
Swift Water/ Surface Water Rescue Plans	Protocols for three major reservoirs

Mitigation Strategy

Table 236. Mitigation Actions: Hartsel Fire Protection District

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
HA-1: Grassland Fire Response Vehicle	Enhance grassland and fire suppression	Acquire specialized grassland fire response vehicle with high-capacity water tank and off-road capability for South Park terrain	Wildfire (grassland)	HFPD	\$600,000	1-2	FEMA, AFG, VFA, District	High	Structure & Infrastructure
HA-2 Water Tender Upgrade	Improve water supply capability	Replace aging water tender with modern 3,000+ gallon unit for areas without water supply	Structure Fire, Wildfire	HFPD	\$2,000,000	2-3	FEMA, AFG, VFA, District	High	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		infrastructure							
HA-3: Station Generator or Systems	Maintain operations during outages	Install backup generators at Station 3; fuel storage; automatic transfer; cold-weather rated	Winter Storm, High Wind	HFPD	\$220,000	1-3	FEMA, HMGP, District, DOLA	High	Structure & Infrastructure
HA-4: Communication System Upgrade	Improve emergency communications	Upgrade radio system to digital P25; improve coverage across 753 sq mi; add repeaters for remote areas	All hazards	HFPD/ Counties	\$150,000	1-3	FEMA, EMPG, Counties, District	High	Structure & Infrastructure
HA-5: Volunteer Recruitment/ Retention	Maintain Adequate Staffing	Comprehensive volunteer program; recruitment for remote area coverage, retention incentives, training, equipment, housing assistance	All hazards	HFPD	\$65,000	Ongoing	FEMA, SAFER, VFA, District	High	Public Education



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
HA-6: Swift water/diving equipment	Enhance reservoir rescue capability	Upgrade swift water and surfaces water equipment for 3 major reservoirs: boats, drone, ice rescue equipment	Recreation Emergency	HFPD	\$150,000	1-2	FEMA, AFG, CPW, District	Medium	Structure & Infrastructure
HA-7: Wildfire Education Program	Increase community preparedness	Expand public education: workshops on grassland fire risk, defensible space, burn permits, evacuation planning for remote areas	Wildfire	HFPD/CSFS	\$20,000	Ongoing	CSFS, VFA, District	Medium	Public Education
HA-8: Station Winterization	Protect equipment in extreme cold	Upgrade heating, insulation and cold weather equipment protection at all 6 stations for -40° operations	Extreme Cold	HFPD	\$125,000	2-4	District, DOLA	Medium	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
HA-9: Emergency Medical Equipment	Enhance remote EMS capability	Acquire advanced medical equipment for remote operations; improve coordination with South Park ambulance; training	Medical Emergency	HFPD/ South Park Ambulance	\$40,000	1-2	FEMA, AFG, District	Medium	Structure & Infrastructure
HA-10: Fuel Reduction Projects	Reduce Wildfire Fuel Loads	Strategic fuel reduction in forested areas; grassland fuel breaks around subdivisions; coordinate with CSFS and USFS	Wildfire	HFPD/ CSFS/ USFS	\$1,500,000	3-5	CSFS, USFS, County	Medium	Natural Systems Protection
HA-11: Weather Monitoring System	Improve situational awareness	Install Remote Automated Weather Stations (RAWS) for fire weather monitoring and winter storm tracking in South Park basin	Wildfire, Winter Storm	HFPD/ USFS	\$35,000	2-3	USFS, BLM, District	Low	Structure & Infrastructure



Park County Hazard Mitigation Plan 2025

Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
HA-12: Firefighter Training	Maintain qualified personnel	Ongoing training: S-130/190/21 wildland (grassland emphasis), Firefighter I/II, EMS, swift water, surface water, cold weather ops	All hazards	HFPD	\$35,000	Ongoing	FEMA, AFG, VFA, District	Low	Public Education
HA-13: Dam Failure Planning	Prepare for dam emergency	Develop comprehensive response plans for dam failure scenarios at 3 major reservoir; coordinate with dam operators and CPW	Dam Failure, Flooding	HFPD/ Counties/ CPW	\$15,000	1-2	Counties, CPW, FEMA	Low	Local Plans & regulations
HA-14: Water Source Development	Expand water supply for firefighting	Develop additional water sources: cisterns at strategic locations, dry hydrants at ponds, drafting site improvements	Structure Fire, Wildfire	HFPD	\$2,000,000	2-5	VFA, Counties, Subdivisions	Low	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
HA-15: Apparatus Replacement Plan	Maintain reliable fleet	Develop 20-year apparatus replacement schedule accounting for extreme conditions and remote operations across 753 sq miles	All Hazards	HFPD Board	Planning Only	1	District Planning	Low	Local Plans & regulations

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Brian Cook **Title:** Fire Chief

Email: chief@hartsselfire.org **Phone:** 719-836-3500

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Board meetings ☒ Other: Monthly volunteer meetings, coordination with state parks, seasonal preparedness reviews (fire season, winter), reservoir safety coordination

Hartsel Fire Protection District will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Fire Chief and Board of Directors during strategic planning and budget development cycle
- Monthly volunteer meetings to assess mitigation action progress, operational readiness across 753 square miles, and equipment status
- Quarterly coordination meetings with Park County Emergency Management and neighboring fire districts
- Integration of mitigation actions into Capital Improvement Plan, grant applications, annual budget, and training schedules
- Regular coordination with Colorado State Forest Service for wildfire mitigation and grassland fire preparedness
- Coordination with Colorado Parks and Wildlife for reservoir safety, emergency response at Spinney Mountain and Eleven Mile State Parks



Park County Hazard Mitigation Plan 2025

- Coordination with Denver Water and other reservoir operators for dam safety and emergency planning at Antero, Spinney, and Eleven Mile
- After-action reviews following significant incidents to identify lessons learned and operational improvements for remote area response
- Annual fire season preparedness review including grassland fire equipment checks, burn permit program evaluation, and high wind protocols
- Winter preparedness review including extreme cold equipment testing, station winterization, Highway 285/24/9 closure coordination, and isolation planning
- Seasonal recreation safety reviews before summer fishing season and winter ice fishing season
- Community feedback through public meetings, burn permit interactions, and coordination with ranching community
- Grant progress reporting to funding agencies with documentation of outcomes and expenditures
- Five-year comprehensive plan update in coordination with Park County's and Fremont County's HMP update cycles
- Annual training reviews to ensure volunteer readiness for grassland fires, structure fires, swift water/dive rescue, and remote operations
- Equipment maintenance tracking accounting for harsh conditions (extreme cold, high winds, altitude, remote operations)
- Burn permit program monitoring to assess effectiveness and compliance
- Coordination with ranching community for agricultural safety and emergency access improvements
- Highway 285/24/9 corridor safety planning with CDOT and county road departments



Jefferson-Como Fire Protection District

The Jefferson Como Fire Protection District (JCFPD) was established in 1960 and serves approximately 525 square miles in western Park County, Colorado. The district encompasses some of the most rugged and remote terrain in the county, including portions of Pike National Forest, Lost Creek Wilderness, Kenosha Pass, Boreas Pass, and numerous mountain valleys and creek drainages. The district serves an estimated permanent population of 650-800 residents, with significant seasonal increases from recreational use and second-home owners. JCFPD operates as a combination department with paid professional staff available 24/7 and approximately 15 volunteer firefighters. The district maintains seven stations strategically located throughout its expansive service area. Communities served include Como, Jefferson, Indian Mountain, Stage Stop, Lost Park, Tarryall, and numerous other subdivisions and rural areas. The district faces extreme wildfire risk due to extensive forest coverage, steep terrain, limited water supply, and wildland-urban interface development. Other significant hazards include severe winter weather isolating communities, flooding along creek drainages, avalanche risk at high elevations, and medical emergencies in extremely remote locations.

Jurisdiction Profile

Jefferson Como Fire Protection District provides comprehensive emergency services including structure fire suppression, wildland firefighting, emergency medical services (EMR and EMT-Basic level), technical rescue, vehicle extrication, and hazardous materials response. The district's 525 square miles include elevations ranging from approximately 8,500 feet to over 13,000 feet. The terrain is characterized by steep mountains, narrow valleys, dense forests, alpine meadows, and wilderness areas. Major geographic features include Kenosha Pass (crossed by U.S. Highway 285), Boreas Pass (historic railroad grade), Georgia Pass, numerous 13,000-foot peaks including Bald Mountain and Mount Guyot, and extensive Pike National Forest and Lost Creek Wilderness lands. Water features include Jefferson Creek, Michigan Creek, Tarryall Creek, Jefferson Lake, Michigan Lake, Tarryall Reservoir, and numerous smaller creeks and beaver ponds. The district's combination staffing model includes 3 career firefighters providing 24-hour coverage with 15 trained volunteers. All personnel are certified as Colorado State Emergency Medical Responders, with many holding Firefighter I and II certifications.

Table 237. Table of Facts: Jefferson-Como Fire Protection District

Category	Details
Land Area	525 square miles
Communities Served	Como, Jefferson, Indian Mountain, Stage Stop, Lost Park, Tarryall, numerous subdivisions
Population Served	~650-800 permanent; 2,000+ seasonal/part-time
Governance	Special District (Title 32) - Board of Directors
Elevation Range	8,500 - 13,000+ feet



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Category	Details
Major Water Bodies	Jefferson Lake, Michigan Lake, Tarryall Reservoir
River(s)	Jefferson Creek, Michigan Creek, Tarryall Creek, numerous tributaries
Number of Fire Stations	7 stations
State Routes	US Highway 285, County Roads
Mountain Passes	Kenosha Pass, Boreas Pass, Georgia Pass
Federal Land	Extensive - Pike National Forest, Lost Creek Wilderness
Land Use	Rural residential, forest, wilderness, recreation
Hospital/Medical Facility	None (Fairplay ~30 miles, Bailey ~40 miles)
Career Firefighters	3 shifts of three personnel 48/96 shifts
Volunteer Firefighters	15
Schools	None in district (students to Fairplay/Bailey)
Law Enforcement	Park County Sheriff's Office
Ambulance Service	South Park Ambulance District (ALS)
Average Annual Calls	200-250 (varies with recreation season)
Power Utility Provider(s)	Core Electric, Mountain View Electric.
Water Supply	Individual wells, small water associations
Emergency Shelters	Fire stations, community centers
Critical Facilities	7 Fire Stations, Communication Sites

Planning Process

Jefferson Como Fire Protection District participated comprehensively in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process. As the largest fire district by area in Park County, JCFPD's input was essential for understanding hazards across the western mountainous portion of the county. The district participated in all phases of planning including initial hazard identification surveys, multiple planning meetings with Park County Emergency Management, and dedicated Hazard Mitigation Planning sessions. District leadership conducted internal assessments of wildfire risk, infrastructure vulnerabilities, response capabilities, and resource needs across the expansive service area. The Emergency Services (ES) Council reviewed historical incident data, analyzed wildfire behavior modeling, assessed structure and equipment needs, and identified critical infrastructure vulnerabilities. Meeting participants included the Fire Chief, Assistant Chief, career staff, volunteer officers, Board members, and representatives from the U.S. Forest Service. The district coordinated closely with Park County Emergency Management, Colorado State Forest Service, U.S. Forest Service South Park Ranger District, and neighboring fire districts to ensure comprehensive regional planning and mutual aid coordination.



Hazards and Risk Summary

Summary of Past Hazard

Table 238. Historical Hazards: Jefferson-Como Fire Protection District

Date	Event	Description
October 1996	Buffalo Creek Fire	Major wildfire burned 12,000 acres north of district; JCFPD provided mutual aid; demonstrated regional wildfire vulnerability.
December 2006	Holiday Blizzard	Massive blizzard isolated communities for multiple days; Highway 285 closed over Kenosha Pass; emergency response severely limited; numerous rescue calls.
Summer 2008	Wildfire Activity	Multiple small wildland fires throughout district; resource strain with concurrent incidents; mutual aid essential.
Summer 2012	High Wildfire Season	Statewide drought and wildfire activity; district on high alert; pre-positioning of resources.
September 2013	Regional Flooding	Heavy rainfall caused flooding on Jefferson Creek, Michigan Creek, and Tarryall Creek; road washouts isolated areas.
Winter 2019	Extended Severe Winter	Prolonged extreme cold and heavy snow; multiple roof collapses; volunteer response challenged; Highway 285 frequently closed.
Summer 2020	Regional Wildfire Smoke	Cameron Peak and other fires caused extended poor air quality; respiratory emergencies increased.
2021-2023	Increased Recreation	Post-pandemic surge in recreation led to increased medical emergencies, vehicle accidents on mountain roads, lost hikers/ATVers.
Ongoing	Vehicle Accidents Highway 285	Regular extrication calls on Highway 285, particularly on Kenosha Pass during winter; high-speed crashes; commercial vehicles.



Significant Hazards

Table 239. Hazards: Jefferson-Como Fire Protection District

Hazard Ranking	Hazard
High Hazards	Wildfire, Severe Winter Weather, Medical Emergency (remote), Vehicle Accident/Extrication
Medium Hazards	Flooding, Avalanche, Structure Fire, Drought
Low Hazards	Dam Failure, Hazmat Incident, Earthquake, Lightning, Lost Person

Hazard Specific Vulnerabilities

Wildfire: Wildfire represents the most significant and complex hazard facing JCFPD. The district contains hundreds of thousands of acres of densely forested terrain with heavy fuel loads including dead and down timber from pine beetle kill. Lodgepole pine, ponderosa pine, and mixed conifer forests dominate the landscape. Steep slopes, deep canyons, and limited access hamper suppression efforts. Wildland-urban interface development is extensive with hundreds of structures scattered throughout forested areas, many accessed only by narrow dirt roads. Water supply for firefighting is extremely limited—no fire hydrants exist in most areas, requiring water tenders and drafting from natural sources. The 1996 Buffalo Creek Fire and 2002 Hayman Fire (nearby) demonstrated catastrophic potential. Drought conditions, pine beetle damage, and climate change have increased fuel loads and fire behavior intensity. The district coordinates closely with U.S. Forest Service but jurisdictional boundaries complicate response. Multiple concurrent fires can overwhelm resources quickly.

Severe Winter Weather: The district experiences extreme winter conditions with heavy snowfall (300+ inches in higher elevations), severe cold (-30°F not uncommon), and dangerous wind. Highway 285 over Kenosha Pass frequently closes during storms, isolating the entire western portion of the county. County roads become impassable, stranding residents and making emergency response impossible. Snow load causes roof collapses, particularly on older structures and outbuildings. Volunteer availability decreases during severe weather as many live outside the district. Equipment reliability decreases in extreme cold. Medical emergencies become life-threatening when transport times to hospitals exceed 90 minutes. Avalanche danger increases on steep slopes.

Medical Emergency (Remote): Medical emergencies in remote locations present extreme challenges. Many residences are 30-60 minutes from the nearest fire station by paved road, with additional time on unpaved roads. Cell phone coverage is spotty or non-existent in many areas. Helicopter landing zones are limited by terrain and weather. Transport to hospital in Fairplay takes 45-90 minutes depending on location; to Denver-area hospitals is 2+ hours. Aging population with cardiac and stroke risks. Wilderness recreation creates trauma incidents far from roads. Winter conditions exponentially increase response times and complicate evacuations.



Vehicle Accident/Extrication: U.S. Highway 285 is a major transportation corridor traversing the district including the steep, winding ascent over Kenosha Pass. High-speed crashes, commercial vehicle accidents, winter weather collisions, and wildlife strikes are common. Extrication capabilities are critical. County roads are narrow, winding, and steep with significant rollover potential. ATV and off-road vehicle accidents occur frequently on forest roads and trails. Limited helicopter access in canyons complicates evacuations.

Flooding: Spring runoff and summer thunderstorms cause flooding on Jefferson Creek, Michigan Creek, Tarryall Creek, and numerous smaller drainages. Flash flooding in narrow canyons can trap recreationists and damage infrastructure. Bridge and culvert failures isolate communities. Post-wildfire flooding and debris flows dramatically increase flood risk in burned areas. Limited stream gauging makes flood prediction difficult.

Avalanche: Steep mountainous terrain creates avalanche risk, particularly near Kenosha Pass, Boreas Pass, and Georgia Pass. Highway 285 crosses avalanche paths. Backcountry recreationists and snowmobilers are at risk. Limited avalanche rescue capabilities. Avalanches can close roads and isolate communities.

Structure Fire: Rural residential structures are highly vulnerable to fire due to remote locations, limited water supply, long response times, and dependence on wood heat. Many older cabins lack modern fire protection. Propane tanks pose explosion risks. Mutual aid response times are extended, allowing fires to grow before adequate resources arrive.

Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 240. Facilities & Infrastructure Assessment: Jefferson-Como Fire Protection District

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Station 1 (Como - Main)	Wildfire, Winter Storm	No	No	Yes	Yes
Station 2 (Jefferson)	Wildfire, Flood	Partial	Minor	Partial	Limited
Station 3 (Indian Mountain)	Wildfire	No	No	Partial	No
Station 4 (Stage Stop)	Wildfire	No	No	Partial	No
Station 5 (Tarryall)	Wildfire, Flood	No	No	Partial	No
Station 6 (Lost Park)	Wildfire, Remote	No	No	Partial	No



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Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Station 7 (Indian Mountain)	Wildfire	No	No	Partial	No
Communication Towers	Wildfire, Lightning	No	No	Yes	Yes
Highway 285 (Kenosha Pass)	Winter Storm, Avalanche	No	N/A	Partial	N/A
County Road Bridges	Flood	Yes	Yes	Partial	N/A
Water Storage/Cisterns	Freeze, Wildfire	No	No	Partial	N/A
Community Centers	Wildfire, Winter Storm	No	No	Partial	Limited

Potential Loss

Table 241. Potential Loss: Jefferson-Como Fire Protection District

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High Risk)	200,000	1,800	\$630,000,000	900	\$315,000,000
Wildfire (Moderate Risk)	136,000	1,800	\$630,000,000	450	\$157,500,000
Flood (100-year)	8,500	1,800	\$630,000,000	120	\$42,000,000
Severe Winter Weather	336,000	1,800	\$630,000,000	1,800	\$31,500,000
Structure Fire (annual avg)	N/A	1,800	\$630,000,000	12	\$4,200,000



Vulnerable Populations

Jefferson Como Fire Protection District's vulnerable populations include:

- Elderly residents with limited mobility, medical conditions requiring regular care, and difficulty evacuating independently
- Remote rural residents living 30+ minutes from any fire station with single-access roads
- Residents of subdivisions with limited or single evacuation routes (Indian Mountain, Stage Stop, Lost Park)
- Part-time residents and seasonal cabin owners unfamiliar with wildfire procedures and winter survival
- Lower-income households with limited resources for wildfire mitigation, emergency preparedness, or property improvements
- Residents dependent on well water in areas with no water supply for firefighting
- People with disabilities or special medical needs in extremely remote locations
- Wilderness recreationists (hikers, hunters, anglers, ATVers, snowmobilers) unfamiliar with hazards and first aid
- Residents in older structures lacking defensible space, fire-resistant construction, or adequate access
- Individuals living alone in remote cabins with limited communication capabilities
- Tourists and travelers on Highway 285 during winter storms
- Residents of areas prone to isolation during winter storms (Lost Park, upper Jefferson Creek, upper Michigan Creek)

Capability Assessment

Table 242. Capability Assessment: Jefferson-Como Fire Protection District

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Fire Chief ☒ Assistant Chief ☒ Board of Directors (5 members) ☒ Career Staff (9) ☒ Emergency Management (Park County)
Technical	☒ GIS / Mapping (County/CSFS) ☐ Engineering (contracted) ☒ Wildfire Assessment (CSFS) ☒ Fire Prevention (limited)
Financial	☒ District Mill Levy ☒ FEMA Grants (AFG, SAFER, HMGP) ☒ State Grants (DFPC, VFA) ☒ Other: CSFS, DOLA, USFS
Operational	☒ Structure Fire Suppression ☒ Wildland Firefighting (Type 6 engines) ☒ EMS (EMR/EMT-Basic) ☒ Vehicle Extrication ☒ Technical Rescue (limited) ☒ Hazmat Awareness
Staffing	☒ 9 Career Firefighters ☒ 15 Volunteer Firefighters ☒ EMR certified personnel ☒ Firefighter I/II certifications



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Capability Area	Available Resources / Programs (Check all that apply)
Mutual Aid	☒ Automatic Aid with neighboring districts ☒ COFIRE mutual aid system ☒ U.S. Forest Service coordination ☒ Regional fire coordination
Equipment	☒ Type 1 Engines (structure) ☒ Type 3/6 Engines (wildland) ☒ Water Tenders ☒ Brush Trucks ☐ Ambulance ☒ Extrication Equipment ☒ Utility Vehicles
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Expand partnerships and MOU's • Explore additional grant funding opportunities	

National Flood Insurance Program Compliance

NFIP Participation Status

Jefferson Como Fire Protection District is a special district providing emergency services and does not have regulatory authority over floodplain management or land use. NFIP participation and floodplain management are handled at the county level by Park County. The fire district coordinates with Park County floodplain administrators for flood response planning, provides input on flood hazard areas based on operational experience, and participates in post-flood damage assessments

Number of Policies and Repetitive Loss Properties

Table 243. Policies and Repetitive Loss Properties: Jefferson-Como Fire Protection District

Category	2015	2025
Policies	--	--
Number of Repetitive Loss Structures	--	--

Floodplain Management Regulations and Enforcement

Jefferson-Como Fire Protection District is a special district providing emergency services and therefore looks to the surrounding jurisdiction for floodplain regulations and enforcement.

CRS (Community Rating System) Participation

Jefferson-Como Fire Protection District is a special district providing emergency services and therefore does not participate in CRS.



Integration with Other Plans

Table 244. Planning Documents: Jefferson-Como Fire Protection District

Planning Documents	Status
Emergency Operations Plan	District EOP adopted; coordinated with County
Standard Operating Procedures	Comprehensive SOPs maintained and updated
Standard Operating Guidelines	SOGs for all operational areas
Wildland Fire Response Plan	Adopted, coordinates with USFS and CSFS
Community Wildfire Protection Plan	Participates in Park County CWPP; district-specific annexes (currently being updated)
Evacuation Plans	Developed for major subdivisions and high-risk areas
Mutual Aid Agreements	Active agreements with all adjacent districts
Training & Certification Plan	Annual training requirements and certification tracking
Strategic Plan	Multi-year strategic plan (updated 2022)
Capital Improvement Plan	Maintained, updated annually with apparatus replacement schedule
Fire Prevention Programs	Defensible space program, burn permits, inspections
Pre-Fire Plans	Developed for subdivisions, critical facilities
U.S. Forest Service Coordination	Operating agreements and annual operating plans



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Mitigation Strategy

Table 245. Mitigation Actions: Jefferson-Como Fire Protection District

Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
JC-1: Type 3 Wildland Engine	Enhance wildland fire initial attack	Acquire Type 3 wildland engine with 500-gallon capacity and off-road capability for remote fire response	Wildfire	JCFPD	\$450,000	1-2	FEMA AFG, VFA, USFS, District	High	Structure & Infrastructure
JC-2: Water Tender Replacement	Ensure adequate water supply	Replacing aging water tender with modern 3,000+ gallon unit for structure fire water supply in non-hydrant areas	Structure Fire, Wildfire	JCFPD	\$500,000	2-3	FEMA AFG, VFA, District	High	Structure & Infrastructure
JC-3: Station Generator	Maintain operations	Install backup generator	Winter Storm, All	JCFPD	\$250,000	1-3	FEMA HMGP, District, DOLA	High	Structure & Infrastructure



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Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
Systems	during power outages	Stations 1, 2, 3, 4, 6, and 7 with fuel storage and automatic transfer switches	Hazards						
JC-4: Comprehensive Defensible Space Program	Reduce structure wildfire vulnerability	Expand defensible space assessment and assistance program district-wide; provide chipping services; offer cost-share grants for mitigation work	Wildfire	JCFPD/CSFS	\$125,000	Ongoing	CSFS, VFA, County, District	High	Natural Systems Protection
JC-5: Communication System Upgrade	Improve emergency communications	Add repeater sites to cover dead zones; improve station alerting systems	All Hazards	JCFPD/County	\$180,000	1-3	FEMA EMPG, County, District	High	Structure & Infrastructure
JC-6: Wildfire Pre-	Improve wildfire	Develop detailed wildfire	Wildfire	JCFPD	\$35,000	1-2	CSFS, VFA, District	High	Local Plans &



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
Plans & Training	effective responses	pre-plans for all subdivisions including structure protection priorities, water sources, access routes, safety zones; conduct annual drills							Regulations
JC-7: Community Wildfire Education	Increase resident wildfire preparedness	Expand public education program: annual workshops, Home Ignition Zone assessments, evacuation planning, Firewise Community programs for all subdivisions	Wildfire	JCFPD/CSFS	\$25,000	Ongoing	CSFS, VFA, District	High	Public Education



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Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
JC-8: Strategic Fuel Reduction	Reduce wildfire fuel loads	Implement large-scale fuel reduction projects in high-priority areas: evacuation routes, community perimeters, critical infrastructure protection zones	Wildfire	JCFPD/CSFS/USFS	\$500,000	3-5	CSFS, USFS Grants, County, District	Medium	Natural Systems Protection
JC-9: Volunteer Recruitment/Retention	Maintain adequate staffing	Comprehensive volunteer program: recruitment campaigns, retention incentives, training opportunities, equipment, living expense stipends for remote volunteers	All Hazards	JCFPD	\$75,000	Ongoing	FEMA SAFER, VFA, District	Medium	Public Education



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Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
JC-10: Weather Monitoring System	Improve situational awareness	Install Remote Automated Weather Stations (RAWS) at strategic locations for fire weather monitoring and winter storm tracking	Wildfire, Winter Storm	JCFPD/USFS	\$45,000	2-3	USFS, BLM, District	Medium	Structure & Infrastructure
JC-11: Water Source Development	Expand water supply for firefighting	Develop additional water sources: cisterns at strategic locations, dry hydrants on lakes/ponds, drafting site improvements, snow storage/melt systems	Structure Fire, Wildfire	JCFPD	\$200,000	2-5	VFA, County, Subdivisions, District	Medium	Structure & Infrastructure
JC-12: Station	Protect equipment	Upgrade station heating	Extreme Cold,	JCFPD	\$120,000	2-4	District, DOLA	Medium	Structure &



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
Winterization	ment and maintain operations	systems, insulation, apparatus bay heaters, and weatherproofing to protect equipment and maintain readiness during extreme cold	Winter Storm						Infrastructure
JC-13: Emergency Access Improvements	Improve response times and evacuation	Work with county and subdivisions to improve emergency access: road widening, turnarounds, bridge upgrades, secondary access routes, signage improvements	All Hazards	JCFPD/ County	\$300,000	3-5	County, DOLA, Subdivisions	Medium	Structure & Infrastructure



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Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
JC-14: Firefighter Training Enhancement	Maintain qualified personnel	Provide ongoing training: S-130/190/219 wildland, Firefighter I/II, driver/operator, officer development, EMT upgrades, technical rescue, winter survival	All Hazards	JCFPD	\$40,000	Ongoing	FEMA AFG, VFA, District	Low	Public Education

Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Trent Smith **Title:** Fire Chief

Email: chief@jcfpd.org **Phone:** 719-836-3244

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Board meetings ☒ Other: Monthly officer meetings, quarterly training reviews, incident critiques, USFS coordination meetings, CSFS coordination

Jefferson-Como Fire Protection District will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Fire Chief, Assistant Chief, and Board of Directors during strategic planning and budget development cycle
- Monthly officer meetings to assess mitigation action progress, operational readiness, and adjust priorities based on seasonal conditions and incident experience
- Quarterly coordination meetings with Park County Emergency Management and neighboring fire districts for regional planning and mutual aid



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- Integration of mitigation actions into Capital Improvement Plan, grant applications, annual budget, and training schedule
- Regular coordination with Colorado State Forest Service for wildfire mitigation projects, defensible space programs, and Firewise Community support
- Coordination with U.S. Forest Service South Park Ranger District for fuel reduction projects, operating plans, and wildland fire response
- After-action reviews following significant incidents to identify lessons learned, equipment needs, and training gaps
- Annual wildfire season preparedness review including equipment checks, staffing assessment, water source verification, and evacuation plan updates
- Winter preparedness review including equipment winterization, station readiness, volunteer availability assessment, and Highway 285 coordination
- Community feedback through public education events, board meetings, website, and social media engagement
- Grant progress reporting to funding agencies with documentation of mitigation outcomes and expenditures
- Five-year comprehensive plan update in coordination with Park County's HMP update cycle
- Annual firefighter training reviews to ensure adequate preparedness for wildfire, structure fire, EMS, and technical rescue incidents
- Equipment maintenance tracking and apparatus replacement planning to ensure operational readiness across 525 square miles
- Coordination with subdivision HOAs and property owners associations for wildfire mitigation and emergency planning



Southern Park County (Guffey) Fire Protection District

Southern Park County Fire Protection District (SPCFPD), also known as Guffey Fire & EMS, was established in 1987 and serves approximately 240-242 square miles of sparsely populated mountainous country in the southern portion of Park County, Colorado. The district is headquartered in the town of Guffey (population approximately 100-130), a historic former gold mining community at 8,658 feet elevation originally known as Freshwater. SPCFPD operates 3 strategically located fire stations providing comprehensive all-hazards emergency services including structure fire suppression, wildland firefighting, rescue, and medical transport services across extremely remote and rugged terrain. The district employs paid staff members and dedicated volunteers who provide emergency responses to a service area population of approximately 600-800 residents plus seasonal property owners, recreationists, and through-travelers. The district includes the communities of Guffey, Chumway, and numerous mountain subdivisions including Pike Trails, Bristlecone, and Castle Mountain. The service area encompasses portions of the Thirtynine Mile volcanic area, features significant geologic diversity with Precambrian and Paleogene rocks, and is characterized by steep mountainous terrain, dense forest coverage, limited infrastructure, minimal water supply for firefighting, and long travel distances to definitive medical care facilities.

Jurisdiction Profile

Southern Park County Fire Protection District serves the remote southern end of Park County, characterized by mountainous terrain, dense pine and aspen forests, and extremely sparse population. The district is centered on Guffey, a small unincorporated community located approximately one mile north of State Highway 9 on County Road 102, southeast of South Park. Guffey has a rich mining history dating to 1895 when it was incorporated as Freshwater, reaching a peak population of around 600 during the gold rush era before declining after 1900. The community was sustained by ranching and remains a small, tight-knit mountain community today. The district's service area includes portions of the Thirtynine Mile volcanic area, with rocks from both the Precambrian era (over 1 billion years old) and the Paleogene period (34 million years ago). The area is home to fossil deposits related to Florissant Fossil Beds National Monument. The district includes Freshwater Creek and numerous mountain peaks. The area is known for the 681-pound Guffey meteorite (largest ever found in Colorado) discovered in 1907. SPCFPD faces significant operational challenges including extremely remote locations, limited water supply for firefighting (ISO rating 9 within 5 road miles of stations, ISO 10 beyond), long transport times to medical facilities (Colorado Springs approximately 40 miles), wildland-urban interface wildfire risk, and limited mutual aid availability due to distances from neighboring districts.



Park County Hazard Mitigation Plan 2025

Table 246. Table of Facts: Southern Park County (Guffey) Fire Protection District

Category	Details
Land Area	240-242 square miles
Communities Served	Guffey (HQ), Chumway, mountain subdivisions
Population Served	~600-800 residents; seasonal increases
Guffey Population	~100-130 (historic mining town)
Governance	Special District- Board of Directors
Established	1987
Elevation Range	8,600- 10,000+ feet
Guffey Elevation	8,658 feet
Major Highways	Colorado Highway 9 (nearby)
Access Roads	County Road 102 and numerous forest roads
Creek(s)	Freshwater Creek, West 4-mile Creek, Current Creek
Number of Fire Stations	3 stations
Federal Land	Pike National Forest (adjacent)
Volcanic Area	Thirtynine Mile volcanic area (Paleogene)
Land Use	Residential (very low density), ranching, recreation
Historic Feature	Former gold mining town (Freshwater, est. 1895)
Hospital/Medical Facility	None (Colorado Springs ~40 miles)
Staffing	Paid staff and volunteers
Schools	Guffey Charter School (PK-8, 27 students)
ISO Rating	9 (within 5 miles); 10 (beyond 5 miles)
Law Enforcement	Park County Sheriff's Office
Ambulance Services	SPCFPD provides medical transport
Power Utility	Mountain Parks Electric, IREA
Water Supply	Individual wells, no municipal system
Critical Facilities	3 Fire Stations, School, Communication Tower
Famous Landmark	Guffey meteorite (681 lbs., largest in CO)



Planning Process

Southern Park County Fire Protection District participated comprehensively in the Park County Multi-Jurisdictional Hazard Mitigation Plan update process. As the district serving the most remote and sparsely populated portion of Park County, SPCFPD's participation was essential for understanding hazards affecting communities far from county services and regional resources. The district participated in all planning phases including hazard identification surveys, multiple planning meetings with Park County Emergency Management, and dedicated Hazard Mitigation Planning sessions. District leadership assessed wildfire risks in the extensive wildland-urban interface and forested areas, infrastructure vulnerabilities across extremely remote terrain with limited water supply, medical emergency response challenges with extended transport times, and the impacts of the district's isolated location on mutual aid and resource availability. The planning process included review of historical incident data across 240+ square miles, analysis of response capabilities with limited resources, assessment of the unique geologic and terrain challenges of the Thirtynine Mile volcanic area, and coordination with federal land managers. Meeting participants included the Fire Chief, paid staff, volunteer leadership, Board members, and representatives from the small communities of Guffey and Chumway. The district coordinated closely with Park County Emergency Management, neighboring fire districts (Hartsel FPD, Lake George area districts), U.S. Forest Service, and Colorado State Forest Service for comprehensive regional planning addressing the extreme challenges of providing emergency services across such remote and rugged terrain.

Hazards and Risk Summary

Summary of Past Hazard

Table 247. Historical Hazards: Southern Park County (Guffey) Fire Protection District

Date	Event	Description
June 1977	Tornado	F3 tornado struck approximately 30 miles from Guffey; demonstrated severe weather risk in mountainous terrain.
June 1979	Tornado	F3 tornado 33 miles from Guffey; 1 injury, significant damage; rare mountain tornado event.
December 2006	Holiday Blizzard	Major blizzard isolated Guffey area; Highway 9 impassable; extended community isolation; limited emergency response capability.
Summer 2012	High Wildfire Season	Statewide drought; multiple small fires in district; demonstrated wildland fire risk in forested terrain.



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September 2013	Flooding	Regional flooding event; road damage on County Road 102 and forest roads; access challenges.
Winter 2019	Extended Severe Winter	Prolonged extreme cold and heavy snow; Highway 9 frequently closed; Guffey isolated for extended periods.
Summer 2020	Regional Wildfire Smoke	Cameron Peak and other fires caused extended poor air quality; respiratory concerns for remote residents.
July 2021	Lightning Fires	Multiple lightning-caused fires during dry period; strained limited resources; demonstrated need for wildland capabilities.
Ongoing	Medical Emergencies (Remote)	Regular medical emergencies requiring long transport to Colorado Springs (40 miles); cardiac events, trauma, critical care needs.
Ongoing	Structure Fires (Limited Water)	Structure fires in remote areas with no hydrants; water supply from tenders only; long response times.

Significant Hazards

Table 248. Hazards: Southern Park County (Guffey) Fire Protection District

Hazard Ranking	Hazard
High Hazards	Wildfire, Medical Emergency (Remote), Severe Winter Weather
Medium Hazards	Wildfire, Medical Emergency (Remote), Severe Winter Weather Structure Fire, Drought, Extreme Cold, Lightning
Low Hazards	Flooding, Tornado, Hazmat Incident, Earthquake

Hazard Specific Vulnerabilities

Wildfire: Wildfire is the highest priority hazard for SPCFPD. The district's 240+ square miles consist primarily of dense pine and aspen forests with extensive wildland-urban interface. Homes and subdivisions are scattered throughout forested areas with limited defensible space. Pine beetle kill has dramatically increased dead fuel loads. Lightning is a frequent ignition source in this elevated terrain. The 2021 lightning fires demonstrated the district's vulnerability to multiple concurrent incidents. Water supply for firefighting is extremely limited no hydrants exist, and the district must rely entirely on water tenders and natural sources (ponds, creeks) which may be seasonal or inadequate. Long response times to remote properties mean fires can grow significantly before suppression begins. Narrow, winding forest roads limit access and complicate evacuation.



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The ISO rating of 9-10 reflects these challenges. Mutual aid from neighboring districts takes 30-60+ minutes. Coordination with U.S. Forest Service is essential but jurisdictional boundaries complicate response. Drought conditions and climate change are increasing fire season length and intensity.

Medical Emergency (Remote): Medical emergencies are critically challenging in SPCFPD's remote service area. No medical facility exists within the district. Colorado Springs (approximately 40 miles) is the nearest hospital with advanced capabilities. Many properties are 30-60+ minutes from fire stations via rough forest roads. The district provides medical transport services, but extended transport times to definitive care mean that for cardiac arrest, stroke, major trauma, and other time-critical conditions, outcomes may be compromised. Helicopter operations are limited by weather, terrain, and altitude. The aging population in mountain communities increases medical call volume. The small Guffey Charter School (27 students) requires pediatric emergency capabilities. Winter road closures can make transport impossible, creating life-threatening situations.

Severe Winter Weather: Winter weather severely impacts SPCFPD operations. The mountainous terrain at 8,600-10,000+ feet receives heavy snowfall, experiences extreme cold (regularly -20°F to -30°F), and faces dangerous wind chill. Highway 9 closures isolate Guffey and surrounding areas from regional resources. County Road 102 and forest roads become impassable. Medical emergencies during winter storms are life-threatening with no local medical facility and transport to Colorado Springs impossible. Volunteer response is challenged when members cannot reach stations. Snow load on structures in the historic Guffey area is a concern. Equipment performance degrades in cold and altitude. The district's remote location means extended isolation during severe weather events.

Structure Fire: Structure fires in SPCFPD's service area face extreme challenges. No hydrants exist anywhere in the district (reflected in ISO rating of 9-10), with the exception of 1 hydrant at Station 1 in Guffey. This hydrant is backed with 30k gallons of water. All water for firefighting must come from tenders or natural sources. Many properties are on long, narrow, rough driveways making apparatus access difficult. Wood construction and wood heat (creating chimney fire risk) are common. Long response times mean structures are often fully involved before suppression begins. Mutual aid takes 30+ minutes minimum. Historic structures in Guffey dating to the mining era are vulnerable. The small population means working structure fires require all available district resources plus mutual aid.

Drought: Drought increases wildfire danger, stresses already-limited water supply for firefighting, affects natural water sources (ponds, creeks) needed for tanker filling, and impacts well water supplies for residences. Extended drought was a factor in the 2012 fire season.

Extreme Cold: Mountain elevations (8,600-10,000+ feet) create temperatures of -20°F to -30°F during winter. Extreme cold affects equipment reliability, creates hypothermia risks for emergency responders, and increases medical emergencies (cardiac stress, hypothermia).

Lightning: The mountainous terrain and elevation make the district vulnerable to frequent lightning activity, particularly during summer monsoon season. Lightning is a primary wildfire ignition source (2021 lightning fires). Lightning also poses direct risks to structures, communication towers, and people outdoors.



Vulnerability & Community Assets

Critical Facilities & Infrastructure Systems

Table 249. Facilities & Infrastructure Assessment: Southern Park County (Guffey) Fire Protection District

Critical Facility	Hazard	500 Year Flood Plain	Flooded in the Past	Mitigated	Generator
Fire Station 1 (Guffey HQ)	Wildfire, Winter Storms	No	No	Partial	Yes
Fire Station 2	Wildfire, Remote	No	No	Partial	Limited
Fire Station 3	Wildfire, Remote	No	No	Partial	No
Guffey Charter School	Wildfire, Snow Load	No	No	Partial	Limited
County Road 102	Winter Storms, Wildfire, Flooding	Partial	Yes	Partial	N/a
Highway 9 (nearby)	Winter Storms, Wildfire	No	No	Partial	N/a
Communication Tower	Lightning, Wildfire	No	No	Yes	Yes
Guffey Commercial Area	Wildfire, Structure Fire	No	No	Partial	N/a
Freshwater Creek	Flood	Yes	Minor	No	N/a



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Potential Loss

Table 250. Potential Loss: Southern Park County (Guffey) Fire Protection District

Category	Acreage	Number of Structures	Structure Values	Number of Structures Impacted	Potential Loss
Wildfire (High Risk)	85,000	680	\$238,000,000	170	\$59,500,000
Wildfire (Moderate Risk)	70,000	680	\$238,000,000	136	\$47,600,000
Severe Winter Weather	154,800	680	\$238,000,000	680	\$11,900,000
Structure Fire (limited water)	N/a	680	\$238,000,000	68	\$23,800,000
Structure Fire (annual avg)	N/a	680	\$238,000,000	5	\$1,750,000

Vulnerable Populations

Southern Park County Fire Protection District's vulnerable populations include:

- Remote rural residents living 30-60+ minutes from fire stations and 40+ miles from medical care (Colorado Springs)
- Elderly mountain residents with chronic medical conditions requiring extended ambulance transport times to hospitals
- School children at Guffey Charter School (27 students, grades PK-8) requiring safe shelter and evacuation capabilities
- Seasonal residents and property owners unfamiliar with remote mountain hazards and emergency procedures
- Lower-income households with limited resources for wildfire mitigation, emergency preparedness, or property improvements
- Residents of properties with long, narrow, rough access roads limiting fire apparatus response
- Residents in forested areas without defensible space and limited water supply for structure protection (ISO 9-10)
- People with disabilities or special medical needs in areas with no local medical facility and extended transport times



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- Residents in areas with single access roads that can be blocked by wildfire, winter storms, or washouts
- Cardiac and stroke patients for whom extended transport times may be life-threatening
- Trauma victims requiring rapid transport to surgical facilities
- Residents dependent on wells for water supply during drought
- Historic Guffey community residents in older structures potentially vulnerable to snow load and fire
- Ranchers and agricultural workers in isolated locations at risk for equipment accidents
- Recreationists and visitors unfamiliar with mountain weather, wildfire risks, and remote terrain
- Residents during winter when Highway 9 and County Road 102 closures isolate the community

Capability Assessment

Table 251. Capability Assessment: Southern Park County (Guffey) Fire Protection District

Capability Area	Available Resources / Programs (Check all that apply)
Administrative	☒ Fire Chief ☒ Board of Directors ☒ Paid Staff ☒ Volunteers ☒ Emergency Management (Park County)
Technical	☒ GIS / Mapping (County/CSFS) ☐ Engineering (contracted as needed) ☒ Wildfire Assessment (CSFS) ☒ Fire Prevention
Financial	☒ District Mill Levy ☒ FEMA Grants (AFG, HMGP) ☒ State Grants (DFPC, VFA) ☒ Other: CSFS, DOLA
Operational	☒ Structure Fire Suppression ☒ Wildland Firefighting ☒ Medical Transport (ambulance service) ☒ Rescue ☒ All-Hazards Response
Mutual Aid	☒ Mutual Aid Agreements (extended response times) ☒ COFIRE mutual aid ☒ Regional coordination ☒ USFS coordination
Equipment	☒ Structure Engines ☒ Wildland Engines/Brush Trucks ☒ Water Tenders (critical - no hydrants) ☒ Ambulances ☒ Rescue Equipment
How to expand on and improve existing capabilities?	
• Expand training, planning and drills for natural hazards and mitigation • Expand partnerships and MOU's • Explore additional grant funding opportunities	



National Flood Insurance Program Compliance

NFIP Participation Status

Southern Park County Fire Protection District is a special district providing emergency services and does not have regulatory authority over floodplain management or land use. NFIP participation and floodplain management are handled at the county level by Park County. The fire district coordinates with Park County floodplain administrators for flood response planning and provides operational input based on emergency response experience along Freshwater Creek and other drainages.

Number of Policies and Repetitive Loss Properties

Table 252. Policies and Repetitive Loss Properties: Southern Park County (Guffey) Fire Protection District

Category	2015	2025
Policies	--	--
Number of Repetitive Loss Structures	--	--

Floodplain Management Regulations and Enforcement

Southern Park County (Guffey) Fire Protection District is a special district providing emergency services and therefore looks to the surrounding jurisdiction for floodplain regulations and enforcement.

CRS (Community Rating System) Participation

Southern Park County (Guffey) Fire Protection District is a special district providing emergency services and therefore does not participate in CRS.

Integration with Other Plans

Table 253. Planning Documents: Southern Park County (Guffey) Fire Protection District

Planning Documents	Status
Emergency Operations Plan	District EOP; coordinated with County
Community Wildfire Protection Plan	Participates in Park County CWPP; district-specific annexes (currently being updated)
Standard Operating Procedures	SOPs maintained
Policy Manual	Comprehensive policy manual maintained
Bylaws	District bylaws current
Wildland Fire Response Plan	Adopted; coordinates with USFS/CSFS



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Planning Documents	Status
Community Wildfire Protection Plan	Participates in Park County CWPP
Mutual Aid Agreements	Active with neighboring districts
Training Plan	Annual training requirements
Capital Improvement Program	Multi-year CIP maintained annually
Fire Prevention Programs	Defensible space education, inspections
Medical Billing Policies	Adopted policies for ambulance transport billing
Code of Ethics	District Code of Ethics adopted
Mission Statement	District mission statement maintained

Mitigation Strategy

Table 254. Mitigation Actions: Southern Park County (Guffey) Fire Protection District

Project # & Name	Goal/Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
<i>The cost of several projects has been determined and included in the table below. Other mitigation projects have estimated the costs of these projects. The potential cost to implement mitigation projects have been ranked as high (\$100,000+), medium (\$25,000-\$100,000) or low cost (under \$25,000).</i>									
SP-1: Water Tender Replacement	Critical water supply capability	Replace aging water tender with modern 3,000+ gallon unit; essential given no hydrants anywhere in 240+ square mile district	Structure Fire, Wildfire	SPCFPD	\$550,000	1-2	FEMA AFG, VFA, District	High	Structure & Infrastructure
SP-2: Ambulance	Enhance medical	Replace/upgrade ambulance	Medical	SPCFPD	\$350,000	2-3	FEMA AFG, District,	High	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
Upgrade	Improve transport capability	Plan for extended-distance transports to Colorado Springs (~40 miles); improved patient care equipment	Emergency				Medical billing revenue		Infrastructure
SP-3: Wildland Fire Equipment	Enhance wildfire suppression	Acquire Type 6 wildland engine and wildland firefighting equipment for forested terrain; hand tools, PPE, communications	Wildfire	SPCFPD	\$300,000	1-3	FEMA AFG, VFA, USFS, District	High	Structure & Infrastructure
SP-4: Station Generator or Systems	Maintain operations during outages	Install backup generators at Stations 2 and 3; fuel storage; automatic transfer; cold-weather	Winter Storm, All Hazards	SPCFPD	\$120,000	1-3	FEMA HMGP, District, DOLA	High	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		rated for mountain conditions							
SP-5: Communication System Upgrade	Improve emergency communications	Upgrade radio system to digital P25; improve coverage across mountainous 240 square miles' portable repeaters	All hazards	SPCFPD/ County	\$100,000	1-3	FEMA, EMPG, County, District	High	Structure & Infrastructure
SP-6: Volunteer Recruitment/Retention	Maintain adequate staffing	Comprehensive volunteer program for remote area: recruitment, retention incentives, training, equipment, housing assistance	All hazards	SPCFPD	\$50,000	Ongoing	FEMA, SAFER, VFA, Districts	Medium	Public Education
SP-7: Wildfire Mitigation Program	Reduce Wildfire Risk	Community wildfire education; defensible space assessments; fuel reduction projects;	Wildfire	SPCFPD/ CSFS	\$75,000	1-5	CSFS, VFA, County	Medium	Public Education



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		Firewise Community Development							
SP-8: Water Source Development	Expand water supply for firefighting	Develop additional water sources: cisterns at strategic locations, dry hydrants at ponds, drafting site improvements on creeks	Structure Fire, Wildfire	SPCFPD	\$200,000	2-5	VFA, County, Subdivisions, District	Medium	Structure & Infrastructure
SP-9: School Emergency Planning	Enhance school safety	Comprehensive emergency plan for Guffey Charter School (27 students PK-8); wildfire evacuation, shelter-in-place, medical	All hazards	SPCFPD/ School	\$15,000	1-2	School, County	Medium	Local Plans & regulations
SP-10: Station Winterization	Protect equipment in extreme cold	Upgrade heating, insulation and cold weather protection	Extreme Cold, Winter Storms	SPCFPD	\$85,000	2-4	District, DOLA	Medium	Structure & Infrastructure



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
		at all 3 stations for -30° F mountain winter operations							
SP-11: Access Road Improvements	Improve emergency access	Work with property owners and county to improve access to remote properties: road widening, turnarounds, signage, addressing	All hazards	SPCFPD/ County	\$150,000	3-5	County, DOLA, Property Owners	Low	Structure & Infrastructure
SP-12: Firefighter Training	Maintain qualified personnel	Ongoing training; S-130/190/219 wildland firefighter I/II, EMT, mountain/remote operations, cold weather ops	All hazards	SPCFPD	\$30,000	Ongoing	FEMA, AFG, VFA, District	Low	Public Education
SP-13: Pre-Fire Planning	Improve response	Develop pre-plans for all critical facilities	Structure Fire, Wildfire	SPCFPD	\$20,000	1-2	VFA, District	Low	Local Plans & Regulations



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Project # & Name	Goal/ Objective	Project or Action	Hazard Addressed	Lead Agency	Estimated Cost	Timeframe (Years)	Potential Funding Sources	Priority (High/Medium/Low)	Mitigation Technique Category
	efficiency	and high-risk properties: water sources, access routes, hazards, pre-positioning							
SP-14: Medical Equipment Upgrade	Enhance remote medical care	Acquire advanced medical equipment for extended transport times: cardiac monitors, medications, airway equipment	Medical Emergency	SPCFPD	\$35,000	1-2	FEMA, AFG, Medical Billing, District	Low	Structure & Infrastructure
SP-15: Apparatus Replacement Plan	Maintain reliable fleet	Develop 20-year apparatus replacement schedule accounting for mountain conditions and remote operations	All hazards	SPCFPD Board	Planning Only	1	District Planning	Low	Local Plans & Regulations



Plan Maintenance and Implementation

Local Point of Contact for HMP Implementation:

Name: Aric Stahly **Title:** Fire Chief

Email: Chief@Guffeyfire.net **Phone:**

How will this jurisdiction monitor and evaluate progress?

☒ Annual review ☒ Participation in County EMA updates ☐ Community surveys
☒ Board meetings (regular monthly) ☒ Other: Staff and volunteer meetings, incident reviews, seasonal preparedness reviews (fire season, winter), coordination with small Guffey community

Southern Park County (Guffey) Fire Protection District will monitor and implement this Hazard Mitigation Plan through:

- Annual comprehensive review by Fire Chief and Board of Directors during strategic planning and budget development cycle
- Regular staff and volunteer meetings to assess mitigation action progress, operational readiness across 240+ remote square miles, and equipment status
- Quarterly coordination meetings with Park County Emergency Management and neighboring fire districts (Hartsel, Lake George area)
- Integration of mitigation actions into Capital Improvement Program (annual multi-year CIP), grant applications, and annual budget
- Regular coordination with Colorado State Forest Service for wildfire mitigation and defensible space programs in forested areas.
- Coordination with U.S. Forest Service for wildland fire planning and Pike National Forest operations.
- After-action reviews following significant incidents to identify lessons learned and operational improvements for remote area response
- Annual fire season preparedness review including wildland equipment checks, water source verification, and evacuation route planning
- Winter preparedness review including extreme cold equipment testing (-30°F), station winterization, Highway 9/County Road 102 closure planning, and isolation response
- Coordination with Guffey Charter School for emergency planning and safety drills for 27 students (PK-8).
- Community feedback through interaction with small Guffey community, public meetings, and coordination with property owners
- Grant progress reporting to funding agencies with documentation of outcomes and expenditures
- Five-year comprehensive plan update in coordination with Park County's HMP update cycle
- Annual training reviews to ensure personnel readiness for structure fires, wildland fires, medical transport, and remote/mountain operations



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- Equipment maintenance tracking accounting for harsh mountain conditions (extreme cold, rough roads, altitude)
- Medical transport program evaluation to ensure effective patient care during extended transport times to Colorado Springs
- ISO rating improvement efforts to address water supply and access challenges (current 9-10 rating)
- Coordination with historic Guffey community for preservation of mining-era structures while improving fire safety



Chapter Six: Plan Implementation

The implementation plan details the steps for each mitigation action, including timelines, responsible parties, and required resources. Identifying and securing funding from various sources is critical to the success of the mitigation strategy. Potential funding sources include the FEMA Hazard Mitigation Grant Program (HMGP), state and government funds, private sector partnerships, and community fundraising efforts. Establishing a process to monitor progress and evaluate the effectiveness of the mitigation strategies is essential. An annual review will be conducted, and performance metrics will be developed to measure progress, such as the number of completed projects, reduced risk levels, and community preparedness levels.

Plan Maintenance

The plan will be reviewed and updated regularly to reflect changes in community priorities, new scientific data, and lessons learned from recent disasters. The review cycle will occur every five years or after a significant disaster. The update process will involve stakeholders and the public to ensure that the plan remains relevant and effective.

Continued public involvement is crucial for the plan's success. Community meetings will be hosted annually to discuss progress and gather input and feedback mechanisms such as online portals and hotlines will be provided for residents to submit feedback and suggestions. Regularly reporting progress to government officials, stakeholders, and the public is also essential. An annual report detailing the progress made towards implementing the mitigation actions will be published.

Maintenance Schedule

Maintaining the Park County HMP is a critical, ongoing process to ensure the document remains effective and relevant in addressing current and emerging risks. The plan should undergo a regular annual review, led by the Park County Office of Emergency Management, to ensure that it reflects updates to FEMA guidelines, changes in local demographics, infrastructure developments, new hazard assessments, and lessons learned from recent disasters. This process ensures the HMP remains a dynamic resource for hazard mitigation. Additionally, the progress of mitigation actions should be monitored semi-annually by the Park County Emergency Services (ES) Council. This involves tracking the status of projects, identifying barriers to implementation, updating funding sources, and adjusting timelines and responsible agencies as needed.

Public engagement is essential in maintaining the HMP's relevance and effectiveness. Annual or post-disaster public meetings should be conducted to gather community feedback, enhance public awareness, and refine hazard priorities. Collaboration with neighboring counties, state agencies, and tribal entities will help address regional hazards and ensure a coordinated response to shared risks. Following any disaster, the HMP should be updated within three months to incorporate insights and data from the event, evaluate the performance of existing mitigation strategies, and adjust risk assessments and priorities.



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The plan's performance should be evaluated bi-annually to ensure its strategies are effective. This includes measuring the impact of mitigation actions using established metrics, comparing pre- and post-implementation hazard impacts, and assessing improvements in community resilience. Every five years—or as required by FEMA—the HMP must undergo a comprehensive update and re-adoption. This includes reviewing all plan sections, integrating new data, policies, and community feedback, and ensuring compliance with FEMA requirements. The updated plan should then be formally adopted by local governments through resolutions.

Integration with other county plans and policies is a continuous effort. The HMP must align with documents such as the Park County General Plan, Emergency Operations Plan (EOP), and related strategies for land use, and transportation. This alignment ensures consistency in hazard management across all county initiatives. Training and exercises should be conducted annually to familiarize stakeholders with the HMP and test its application during emergencies. Workshops, tabletop exercises, and full-scale exercises provide valuable opportunities to identify gaps and make necessary adjustments.

Regular reporting and documentation are critical components of plan maintenance. Park County Office of Emergency Management (OEM) should prepare annual reports summarizing maintenance activities, progress on mitigation actions, and overall plan effectiveness. These reports, along with records of revisions, public comments, and committee meetings, should be maintained and submitted to FEMA and the Colorado Division of Homeland Security and Emergency Management (DHSEM) as required. This structured maintenance approach ensures that the Park County HMP remains a robust and actionable tool for reducing vulnerability and enhancing resilience to hazards. By following this schedule, the county will be well-prepared to address both current challenges and future risks.

Table 255. HMP Maintenance Schedule

Activity	Frequency	Responsible Party	Key Taks
Plan Review	Annually	Emergency Services Planning Council (ESPC)	Review FEMA guidelines, update hazard profiles, demographics, infrastructure changes, and lessons learned.
Monitoring Mitigation Actions	Semi-Annually	Emergency Services Planning Council (ESPC)	Track action status, identify barriers, update funding sources, timelines, and responsibilities.
Public Engagement and Feedback	Annually or post-disaster	Emergency Services Planning Council (ESPC)	Host public meetings, distribute surveys, gather input, and engage stakeholders.



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Activity	Frequency	Responsible Party	Key Taks
Post-Disaster Updates	Within 3 months post-event	Emergency Services Planning Council (ESPC)	Document disaster impacts, evaluate strategy effectiveness, and adjust risk assessments.
Plan Performance Evaluation	Bi-Annually	Emergency Services Planning Council (ESPC)	Measure strategy effectiveness, compare hazard impacts, and assess community resilience improvements.
Comprehensive Plan Update	Every 5 years	Emergency Services Planning Council (ESPC)	Conduct full review, integrate new data and policies, ensure FEMA compliance, and adopt updates through resolutions.
Integration with Other Plans	Ongoing	Emergency Services Planning Council (ESPC)	Align HMP with General Plan, Emergency Operations Plan, and other relevant strategies.
Training and Exercises	Annually	Emergency Services Planning Council (ESPC)	Conduct workshops, tabletop exercises, and full-scale drills to test the plan's application.
Reporting and Documentation	Annually	Emergency Services Planning Council (ESPC)	Document changes and/or updates to the plan to report to the ESPC annually

Monitoring Progress of Mitigation Activities

The Monitoring Progress of Mitigation Activities is a critical element of maintaining the HMP. This process ensures that planned actions are not only implemented but are also effective in reducing vulnerabilities and managing risks. Monitoring progress should be conducted semi-annually by the Emergency Services (ES) Council or a designated team. The tasks involved include tracking the status of mitigation projects, documenting completed and ongoing actions and identifying any projects that are delayed or have encountered barriers to implementation. It is essential to evaluate the reasons for delays and develop practical solutions to overcome obstacles. Additionally, the progress monitoring process requires updating timelines, responsible agencies, and funding sources associated with each mitigation activity to reflect any changes in circumstances or priorities. The results of these evaluations should be communicated to stakeholders to maintain transparency and accountability.



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This monitoring process not only keeps the plan dynamic but also provides valuable insights for improving future mitigation efforts. Regular tracking ensures that mitigation activities align with the county's overarching hazard reduction goals and support the community's resilience against emerging threats.

The following table organizes the monitoring process into clear, actionable steps with assigned responsibilities, objectives, and timeframes to guide the planning area in effectively tracking mitigation activities.

Table 256. HMP Maintenance Schedule

Step	Description	Frequency	Responsible Party	Objective
Establish a Monitoring Team	Form a team with representatives from county departments, local jurisdictions, stakeholders, and experts.	Initial Setup (then ongoing)	Emergency Services Planning Council (ESPC)	Define roles and responsibilities for tracking and evaluating mitigation actions.
Develop a Monitoring Framework	Create an action inventory, set performance metrics, and establish a review schedule. Use tools like spreadsheets or project management software.	Initial Setup (then ongoing)	Emergency Services Planning Council (ESPC)	Organize and standardize the process for tracking mitigation actions effectively.
Gather Data on Mitigation Actions	Collect updates via reports, field inspections, and stakeholder feedback to track action status (completed, in progress, delayed, not started).	Semi-Annually	Agencies and responsible parties for each action	Collect accurate, up-to-date information on mitigation activities.
Evaluate Progress and Identify Barriers	Compare actual progress with planned	Semi-Annually	Monitoring Team	Identify what is working well and what needs



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Step	Description	Frequency	Responsible Party	Objective
	timelines and objectives, assess effectiveness, and identify challenges like funding or resource limitations.			adjustments to ensure progress.
Update Action Details	Revise timelines, funding sources, responsible parties, and priorities based on evaluations.	Semi-Annually	Emergency Services Planning Council (ESPC)	Keep the mitigation plan dynamic and responsive to changing conditions or emerging hazards.
Report Progress	Prepare detailed progress reports and a public summary to share updates and maintain transparency.	Semi-Annually	Park County Office of Emergency Management	Maintain accountability and ensure community involvement in mitigation efforts.
Integrate Lessons Learned	Use findings from monitoring to refine mitigation actions and improve future planning and execution.	Semi-Annually	Emergency Services Planning Council (ESPC)	Enhance the effectiveness of future mitigation activities.
Conduct Annual Review	Include monitoring results in the annual HMP review to ensure the plan reflects updated priorities and mitigation status.	Annually	Park County Office of Emergency Management	Keep the HMP up-to-date and aligned with county goals and community needs.



Maintenance Evaluation and Enhancement

The Maintenance Evaluation and Enhancement is critical for ensuring that the Park County HMP remains a dynamic and effective tool for risk reduction and disaster resilience. This process involves regularly assessing the plan's relevance, identifying opportunities for improvement, and implementing enhancements based on changing conditions, stakeholder input, and lessons learned.

Evaluation Framework

A structured framework is used to systematically evaluate the HMP's effectiveness. The framework involves:

- **Performance Metrics:** Establish clear criteria to measure the success of mitigation actions and overall plan objectives. These metrics may include reductions in community vulnerability, project implementation rates, and improvements in preparedness and response capabilities.
- **Progress Reviews:** Conduct regular reviews of mitigation actions to ensure they align with the timeline, budget, and intended outcomes. This includes evaluating whether the projects effectively address identified hazards.
- **Stakeholder Feedback:** Gather input from government agencies, local jurisdictions, community organizations, and the public to assess the plan's effectiveness and identify areas for improvement.

Annual Maintenance Review

An annual review of the HMP ensures that the document reflects current conditions and priorities. This review includes:

- Incorporating updates to hazard profiles based on new data, recent disasters, or scientific studies.
- Assessing the adequacy of current mitigation actions and identifying new strategies to address emerging risks.
- Updating key sections, such as risk assessments, critical facilities, and community capabilities.

Post-Disaster Plan Updates

Significant updates to the HMP should be undertaken following a disaster event to ensure lessons learned are integrated. This involves:

- Documenting the disaster's impacts, including damage to infrastructure, community resources, and vulnerable populations.
- Evaluating the effectiveness of mitigation strategies during the disaster
- Adjusting risk assessments, mitigation priorities, and strategies based on new insights.



Enhancing the Plan

Enhancements to the HMP are informed by ongoing evaluations and new opportunities. Key actions include:

- Addressing Gaps: Identifying and resolving gaps in mitigation actions, such as underserved populations, underfunded projects, or unaddressed hazards.
- Leveraging Technology: Using Geographic Information Systems (GIS), data analytics, and other tools to improve hazard mapping and risk assessments.
- Strengthening Partnerships: Building stronger collaborations with state and federal agencies, tribal governments, and private-sector organizations to enhance mitigation capabilities and funding opportunities.

Integration with Other Plans

The HMP is regularly integrated with other county and regional plans, including the General Plan, Emergency Operations Plan, and Community Wildfire Protection Plans. This ensures that mitigation strategies are consistent across all planning efforts and align with broader community goals.

Documentation and Reporting

All maintenance and enhancement activities must be well-documented to provide a clear record of updates and changes. This includes:

- Preparing annual progress reports detailing the status of mitigation actions, evaluation outcomes, and updates made to the HMP.
- Sharing summaries with the public to maintain transparency and accountability.
- Submitting updates to FEMA and the Colorado Division of Homeland Security and Emergency Management (DHSEM) for review and compliance.

Continuous Improvement

- The maintenance process should incorporate a continuous improvement cycle, where evaluations inform enhancements, and enhancements feed back into the next review cycle. This iterative process ensures that the HMP remains responsive to changing conditions, emerging hazards, and community needs.
- By maintaining a proactive approach to evaluation and enhancement, Park County can ensure that its HMP remains a living document that effectively reduces risks, builds resilience, and supports the safety and well-being of its communities.



Incorporation into Existing Planning Mechanisms

The successful implementation of the Park County HMP depends on its seamless integration into existing planning mechanisms. Incorporating the HMP into other county, regional, and state plans ensures that hazard mitigation strategies align with broader community goals, enhance resilience, and optimize the use of resources. This integration also ensures that the HMP becomes a living document, informing and supporting decision-making across various sectors.

The HMP should be incorporated into all plans utilized throughout the county and its jurisdictions during each plan's review and update cycles. Specific countywide plans the HMP can be integrated into can be referenced in Tables 5 and 7 in Chapter 1, as well in the jurisdictional profiles in Ch.5. Plans listed here include county and jurisdictional Comprehensive Plans, Community Wildfire Protection Plans, Debris Management Plans, School Safety Plans, and Strategic Master Plans.

Coordination with the Emergency Operations Plan (EOP) is another essential element of integration. The HMP can complement the EOP by providing pre-disaster mitigation actions that reduce the impact of hazards on response and recovery efforts. Preparedness activities, such as training, exercises, and community education, should include mitigation strategies. Furthermore, protecting critical facilities identified in the EOP and aligning mitigation goals with continuity of operations plans are key areas for coordination.

Capital Improvement Plans (CIPs) offer another opportunity to integrate hazard mitigation measures, ensuring the protection of new and existing infrastructure investments. By incorporating the HMP into CIPs, Talladega County and its' participating jurisdictions can prioritize resilient infrastructure projects, such as upgrades to withstand floods, and wildfires. This alignment also helps leverage funding opportunities, such as grants, to improve infrastructure and promote sustainable development.

The HMP should also be coordinated with regional and state-level planning efforts to ensure consistency and maximize the use of external resources. Aligning local actions with the State Hazard Mitigation Plan (SHMP) enhances effectiveness and increases funding eligibility. Coordination with regional transportation plans ensures the resilience of evacuation routes and transportation infrastructure, while integration with watershed and resource management plans supports flood mitigation strategies and natural resource conservation. At the community level, local and neighborhood plans should reflect hazard mitigation goals to build resilience from the ground up. Public engagement is essential for informing local initiatives and encouraging community involvement in risk reduction. Neighborhood-specific mitigation strategies can address risks unique to particular areas, ensuring that all residents benefit from the HMP.

To facilitate effective integration, several tools and mechanisms can be used. Policy alignment is a critical step, requiring a crosswalk analysis to identify opportunities for incorporating HMP goals into existing policies and programs. Training and education for staff and stakeholders ensure they understand how to apply hazard mitigation strategies within their respective plans. Periodic reviews of planning documents help maintain alignment with the HMP, while GIS mapping can overlay hazard data with existing plans to identify integration opportunities. Monitoring and reporting are also necessary to evaluate how effectively the HMP has been incorporated into existing mechanisms.



Regular updates to integrated plans ensure they reflect changes in hazard assessments or mitigation priorities, while annual reporting on integration efforts provides transparency and tracks progress. Feedback and lessons learned from implementation should inform continuous improvement.

By fully incorporating the HMP into existing planning mechanisms, the planning area can ensure that mitigation strategies are effectively implemented, risks are minimized, and the community becomes more resilient to natural and man-made hazards. This integrated approach fosters coordination across departments and agencies, maximizes resource efficiency, and enhances the safety and sustainability of the county and its jurisdictions.

Integration of Hazard Mitigation Planning into Other Local Mechanisms

Since adoption of the previous Park County HMP, the planning area has made incremental progress in integrating hazard mitigation principles into other local planning and regulatory mechanisms. While most participating jurisdictions have not completed formal plan cross-references, hazard-specific data, maps, and mitigation priorities, the HMP has been informally used to guide decision-making in community wildfire planning, floodplain management, and emergency operations planning.

The wildfire hazard profile from the previous HMP is actively being used to inform the current update to the County's Community Wildfire Protection Plan (CWPP). Information such as WUI maps, vulnerabilities and mitigation projects listed in the previous plan were reviewed and used to inform the writing of the CWPP.

Although integration remains largely informal, this plan update establishes a process for each jurisdiction to explicitly reference mitigation goals and actions in future updates to their Comprehensive Plans, Capital Improvement Programs (CIPs), Emergency Operations Plans (EOPs), and Local Development Regulations. Annual coordination meetings facilitated by the County Emergency Management will support continued alignment between these mechanisms and the hazard mitigation strategy.

Continued Public Involvement

Public involvement is a cornerstone of a successful HMP and must be maintained throughout the life of the plan to ensure community buy-in, transparency, and inclusiveness. Continued public involvement allows the community to actively participate in hazard mitigation efforts, providing valuable insights, fostering ownership, and ensuring that the HMP reflects the priorities and needs of Park County residents.

To sustain public involvement, the planning area should host regular public meetings to provide updates on the HMP, discuss progress on mitigation actions, and gather feedback from community members. These meetings should be accessible to all residents, including individuals with functional needs, non-English speakers, and those in remote areas. By using various outreach methods, such as virtual platforms, community newsletters, and local media, the county can maximize participation and ensure that all residents have opportunities to engage.



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Community surveys are another essential tool for public involvement. Periodic surveys can be used to assess public awareness of hazards, understand community concerns, and gather input on the effectiveness of mitigation strategies. These surveys should be distributed through multiple channels, such as online forms, paper surveys at public events, and distribution through local organizations, to reach diverse segments of the population. The results should inform updates to the HMP and guide future mitigation actions.

Partnerships with community organizations, non-profits, and neighborhood groups are vital for fostering continued engagement. These partnerships help extend the county's reach and ensure that vulnerable populations, such as seniors, low-income residents, and tribal communities, are represented in the planning process. Local organizations can also assist in hosting workshops, distributing educational materials, and encouraging their members to participate in HMP-related activities.

Educational initiatives are another critical aspect of continued public involvement. Park County should develop ongoing campaigns to increase public awareness of local hazards, preparedness measures, and mitigation efforts. These campaigns can include workshops, school programs, and outreach events that promote understanding of the HMP and encourage proactive community involvement in risk reduction activities.

A dedicated webpage for the Park County HMP should serve as a central hub for public information. The webpage should include the current plan, progress updates, meeting schedules, and opportunities for public comment. It can also provide an easy way for residents to submit feedback or report concerns related to hazard mitigation. Maintaining an active and transparent online presence will foster trust and ensure that the public remains informed and engaged.

To track public involvement, Park County should establish a process for documenting all engagement activities, including meeting attendance, survey participation, and feedback received. This documentation should be reviewed during the HMP's annual evaluation to assess the effectiveness of public outreach efforts and identify areas for improvement. Lessons learned from these evaluations should be used to enhance future public involvement strategies.

By fostering continued public involvement, the planning area ensures that its HMP remains a collaborative effort. Engaging the community strengthens local resilience, ensures the plan addresses real-world concerns, and builds a culture of preparedness and risk reduction. This approach not only enhances the effectiveness of the HMP but also promotes trust, cooperation, and a shared commitment to the county's safety and sustainability.



Appendices

Appendix A: Glossary of terms used throughout the plan, providing clear definitions for technical language.

Appendix B: List of acronyms to assist with understanding abbreviations used in the document.

Appendix C: Documentation of public participation, including meeting minutes, surveys, and public comments, highlighting the community's involvement in the planning process.

Appendix D: Mitigation action worksheets, outlining specific actions, responsible parties, timelines, and funding sources for each mitigation measure.

Appendix E: Information on potential funding sources for mitigation projects.

Appendix F: Resolutions