



Mammoth Lakes
CALIFORNIA

April 2024



22/23

Winter Storms After-Action Report

Town of Mammoth Lakes



CONSTANT
ASSOCIATES

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Executive Summary

The 2022-23 Winter Season in the Town of Mammoth Lakes presented an unparalleled challenge, characterized by record snowfalls reaching up to 715 inches. This After-Action Report (AAR) evaluates the Town's response to these severe conditions, aiming to provide a comprehensive overview of the operational strengths, identify areas needing improvement, and outline key recommendations for future winter storm and all-hazards responses. The insights and recommendations derived from this report are instrumental in enhancing the Town's resilience and preparedness for similar events.

During the winter season, the Town, alongside county, state, and federal partners, encountered significant operational challenges, including extensive road closures, building damage, propane explosions, and the overwhelming need for snow removal. Despite these escalating and compounding impacts, this report highlights several strengths in the Town's response, notably the use of technology for effective real-time information dissemination, a collaborative and cooperative spirit among emergency services, and proactive public messaging that ensured community safety and awareness.

However, the AAR identifies critical areas for improvement. Key among these is the need for an enhanced snow removal strategy equipped with sufficient resources and equipment to manage unprecedented snow volumes. Furthermore, it points to the necessity for clearer communication strategies between the Town, its residents, and utility providers to ensure cohesive emergency operations. This report also emphasizes the urgent need to improve the structural integrity of buildings to withstand such extreme weather events, suggesting a review and update of current building codes to incorporate standards for heavy snowfall resilience.

The recommendations aim to address these areas, advocating for developing clear protocols for emergency operations, strategic investment in infrastructure and equipment, and a bolstered approach to training and preparedness exercises. By implementing these suggestions, the Town can significantly enhance its capacity to respond to and recover from future winter storms, thus safeguarding the community and its infrastructure against similar challenges.

In conclusion, this AAR serves as a call to action for the Town and its partners. It urges proactive measures to mitigate risks associated with heavy snow and ice accumulation, including adherence to safety standards and improved coordination with regulatory authorities. By taking these steps, the Town can strengthen its emergency response framework, ensuring its residents' and visitors' safety and well-being in the face of future winter storms.

Introduction

A Mammoth Thank You!

The Town of Mammoth Lakes would like to extend its sincere gratitude to all personnel, partner agencies, and community-based partners who supported response operations during this multi-month and multi-hazard severe weather emergency.

Despite the complexity of the winter storms, response efforts highlight the unity that was required to help overcome the challenges presented. For this, the Town would like to thank everyone who contributed to this report's development by completing the survey, participating in facilitated discussions, preparing incident documentation, and validating key input.

A special thanks is due to the Project Planning Team for providing ongoing project oversight and feedback on the report. A full listing of the Project Planning Team can be found in the Appendices.

Purpose and Scope

The purpose of the Town of Mammoth Lakes 2022-23 Winter Storms AAR is to provide a comprehensive overview of the Town's response and recovery efforts during the 2022-23 Winter Season, covering the period from December 2022 to May 2023.

Rather than listing all activities conducted in response to the winter storms, this report focuses on major strengths and areas for improvement, organized by eight themes, and provides recommendations relevant to future emergency responses. The AAR includes an Improvement Plan outlining a strategy for strengthening emergency management capabilities.

The Town contracted Constant Associates to support the AAR's development, including leading the information/data collection process, assisting in stakeholder coordination, and developing the AAR content.

Methodology

The AAR team conducted a comprehensive data collection process to incorporate valuable insight from emergency response partners. The team engaged key individuals and groups through two online surveys and ten facilitated discussions to gather pertinent information. Additionally, the team reviewed over 975 relevant documents, including existing plans, data collected during the response, Standard Operating Procedures, Incident Action Plans, situation reports, and open-source data. This approach was undertaken to ensure the creation of an accurate and recommendation-oriented AAR.

The following 29 agencies and organizations graciously contributed to the development of this report in the effort to make the Town of Mammoth Lakes a safer, better prepared, and more resilient community.

- AmeriGas
- California Department of Transportation
- California Office of Emergency Services
- Caporusso Communications
- Carlsbad Fire Department
- Chula Vista Fire Department
- Eastern Sierra Propane
- Eastern Sierra Transit Authority
- Inyo County Office of Emergency Services
- Mammoth Hospital
- Mammoth Lakes Administration
- Mammoth Lakes Chamber of Commerce
- Mammoth Lakes Community and Economic Development
- Mammoth Lakes Engineering
- Mammoth Lakes Finance
- Mammoth Lakes Fire Protection District
- Mammoth Lakes Parks and Recreation
- Mammoth Lakes Police Department
- Mammoth Lakes Public Works
- Mammoth Lakes Tourism
- Mammoth Lakes Town Council
- Mammoth Yosemite Airport
- Mono County Department of Social Services
- Mono County District 1
- Mono County District 2
- Mono County District 5
- Mono County Office of Emergency Management
- San Diego Fire and Rescue
- Southern California Edison

Incident Overview

Background

From December 2022 through May 2023, the Town of Mammoth Lakes experienced the snowiest season on record, with 715 inches of snow.¹ The initial snowfall in December produced 212 inches of snow accumulation.

A second round of snowfall in January and February brought another 261 inches of heavy, wet snow to the mountain. On March 3, the Town Manager proclaimed a local emergency in accordance with Section 2.48.060 of the Town of Mammoth Lakes Municipal Code.

These extraordinary events challenged response activities and delivery of services. The Town worked in conjunction with county, state, and federal partners to overcome the operational challenges for its residents and visitors.

During the winter season, the Town faced a series of severe challenges due to intense storm events and heavy snowfall. These weather phenomena posed significant threats to the structural integrity of buildings, leading to damage to utility connections. Additionally, snow accumulation along local roadways resulted in street narrowing and necessitated contracted services to clear paths to buried fire hydrants, propane tanks, and regulatory signs obscured by snowbanks.

The town's capacity, along with that of neighboring agencies, was overwhelmed by the volume of snow, rendering streets and rights-of-way unsafe for both vehicles and pedestrians. The situation was exacerbated by Winter Storm Warnings and a Blizzard Warning forecasting up to three feet of snow above 7,000 feet, triggering small avalanches that closed roads and affected transit services.

Blizzard conditions and road closures necessitated the deployment of emergency shelters for both residents and visitors. However, the demands placed on regional resources surpassed available personnel, equipment, and facilities, prompting the need for state assistance. Consequently, both the State of California and Mono County declared States of Emergency due to the severity of the winter storms.

What was initially a winter weather emergency evolved into a multi-layer incident, including building structural integrity and propane explosion challenges, forcing the Town to adapt operations to manage three different hazards.

"Getting the necessary life-saving resources to our community as a result of these relentless and damaging winter storms is the Town's highest priority."

- **Dan Holler,**
Town Manager

¹ Mammoth Mountain Ski Patrol Storm Summaries | 18/19-22/23

Summary Metrics



850
Structural Inspections



~77
Residents Displaced

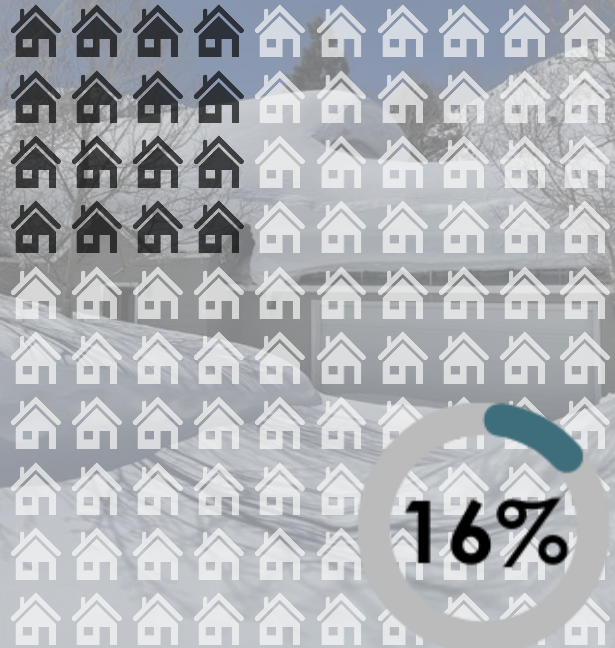


57,000+ yd³
Cal OES Operation
Snow Removed

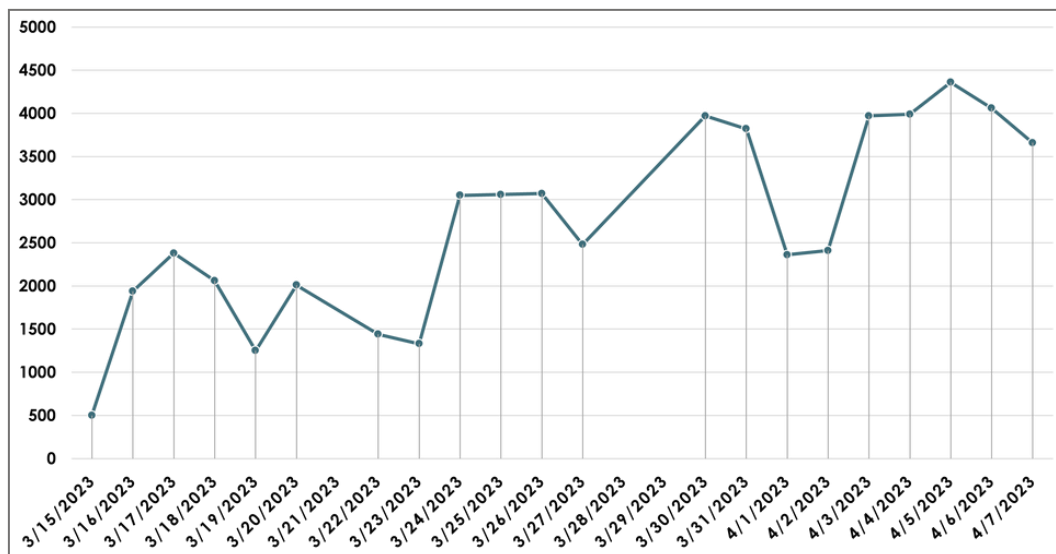


138
Propane-related Incidents

Damaged Homes



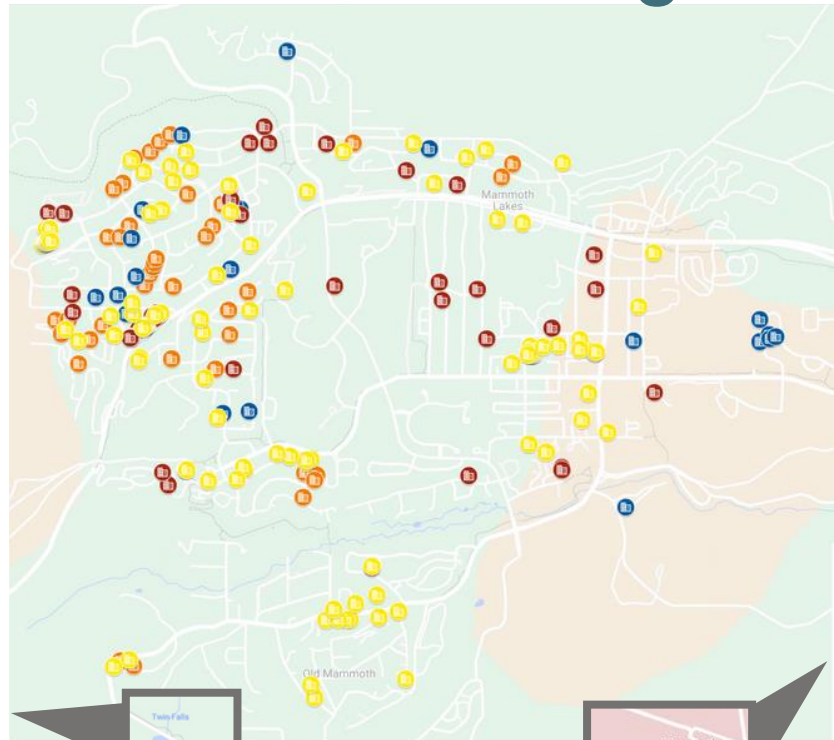
Cal OES Operation Snow Removal Graph



Reported Structural Damages



Figure 1: Urban Search and Rescue (USAR) team adding structural support to a building.



Key

- RED – Unsafe
- YELLOW – Restricted Use
- ORANGE – Minor Damage
- BLUE – Propane Related

Propane-related Incidents

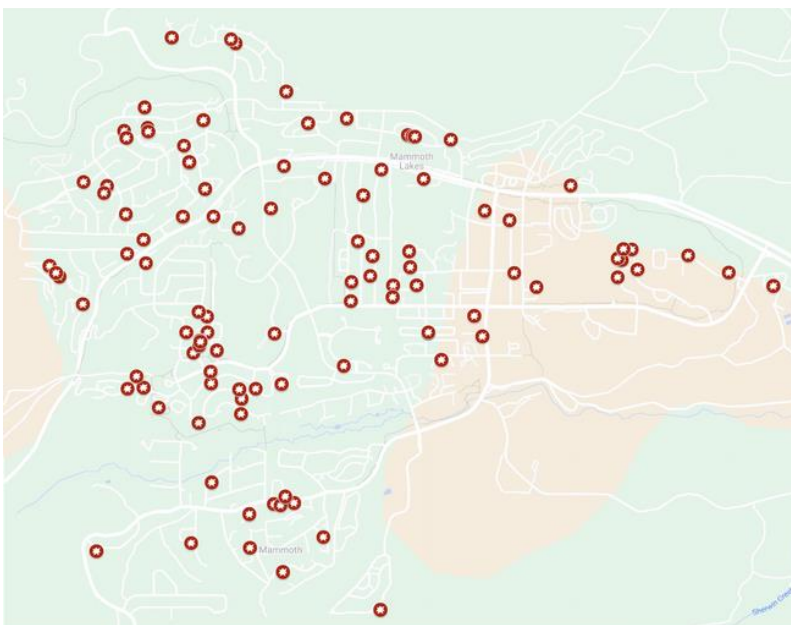


Figure 2: Firefighters actively responding to a structural explosion on Juniper Road.

2022-23 Winter Storms Timeline

This timeline outlines the events that occurred during the 2022-23 Winter Storm Season. This timeline provides an overarching view of the events, and additional details may be found in the *Analysis of Findings* section.

 Snow Level Average Day Temperature 

DECEMBER 31, 2022 212"  35° F 

- The Town opened a Warming Center at Suite Z located at 437 Old Mammoth Road.

FEBRUARY 24, 2023 427"  23° F 

- Daily Winter Storm Briefing Meetings began between the Town and Mono County.

MARCH 1, 2023 538"  18° F 

- California declared a State of Emergency in 13 counties.

MARCH 6, 2023 568"  20° F 

- Daily Winter Storm Briefing Meeting ended.

JANUARY 17, 2023 390"  17° F 

- Emergency Proclamation issued by Mono County.

FEBRUARY 26, 2023 473"  23° F 

- NWS Reno issued a Winter Storm Warning, Blizzard Warning, and Avalanche Watch for Mono County and the Town.

MARCH 3, 2023 538"  22° F 

- The Town Manager issued a Local Emergency Proclamation.

MARCH 7, 2023 568"  17° F 

- The Town Council ratified the Local Emergency Proclamation.
- An Incident Management Team (IMT) was established and managed by Mono County.
- CAL FIRE brought in a Type 2 IMT.
- The Town shared a Heavy Snow Load Public Service Announcement.

MARCH 9, 2023

568"  20° F 

- Urban Search and Rescue (USAR) Chula Vista is prepositioned in Mammoth Lakes.
- Sandbags were made available at the Town Yard.
- President Biden approved California's Emergency Declaration and ordered Federal assistance to supplement state, tribal, and local response efforts.

MARCH 13, 2023

613"  35° F 

- The Town began local operations planning at the Mammoth Lakes Police Department.
- Cal OES Safety Assessment Program (SAP) Team arrived in Mammoth Lakes.
- San Diego Swift Water Team set up in Mono County Offices. The Mammoth Mall Shopping Center parking garage collapsed, crushing the vehicles parked underneath.

MARCH 16, 2023

630"  25° F 

- The Town Declared Extreme Snow Load Evacuation Warning.
- The Town set up a temporary emergency evacuation shelter set up at Mammoth Middle School.
- The Town set up of Call Center for Structural Damage reports.
- Snow Removal Emergency Fund established.

MARCH 10, 2023

568"  34° F 

- Daily Regional Emergency Operations Center (EOC) Briefings began between the Town, Mono County, Inyo County, Cal OES, and CAL FIRE.
- The Town established an Information Center at the Warming Center in Suite Z at 437 Old Mammoth Road.
- Winter Storm Warning, Flood Advisory, and Avalanche Watch remained in effect for Mono County and the Town.

MARCH 15, 2023

613"  35° F 

- The Town and Cal OES began snow trucking operations.
- The Town received 14 trucks and a loader and operator to conduct snow trucking operations.

MARCH 19, 2023

646"  30° F 

- Cal OES SAP Team demobilized.

MARCH 20, 2023

646"  33° F 

- The Town shared Snow Load Advisory Public Service Announcement.

MARCH 24, 2023

667"  28° F 

- The Shelter at Mammoth Middle School was closed.
- The fleet of trucks removing snow expanded to 34, with three loaders and several support vehicles to assist with trucking operations.

APRIL 3, 2023

705"  22° F 

- Small Business Administration (SBA) disaster loans made available to Mono County small businesses.

APRIL 25, 2023

706"  44° F 

- The Town rescinded Evacuation Warning for properties damaged by excessive snowfall.

MAY 15, 2023

715"  54° F 

- The Town launched the Extreme Weather Business Recovery Program.

MARCH 22, 2023

646"  25° F 

- Town Council approved \$200,000 of matching funds to sustain the Snow Removal Emergency Fund.
- First propane explosion occurred at the Val D'Iserre Condominiums.

APRIL 1, 2023

702"  23° F 

- Propane explosion occurred at Juniper Road.

APRIL 7, 2023

706"  34° F 

- Emergency trucking operations end.

MAY 2, 2023

712"  36° F 

- FEMA issued a Notice amending the Major Disaster Declaration for California to include Individual Assistance for Mono County and the Town residents impacted by the Winter Storms.

MAY 16, 2023

715"  56° F 

- A Disaster Recovery Center (DRC) was opened in Mono County to support businesses and homeowners in applying for SBA loans.

Analysis of Findings

Findings are organized by eight key themes that emerged from facilitated discussions, targeted interviews, survey responses, and the documentation review. Each theme includes a summary, identified strengths, identified areas for improvement, and recommended improvement actions.

Recommendations were identified and developed from the facilitated discussions, targeted interviews, survey responses, and the documentation review. The Improvement Plan (IP) encompasses all recommendations organized in a user-friendly spreadsheet to ease document sharing and assignments of corrective actions with multidisciplinary partners and stakeholders.

Town Leadership Management

"The Town was overall effective in establishing and working towards clear objectives... While there are areas for improvement, there was **no loss of life** due to deployment of resources and public messaging."
- **Survey Response**

During the 2022-23 Winter Storms, Mammoth Lakes faced significant challenges due to severe weather conditions and subsequent emergencies. The implementation of a unique multi-county unified command structure marked a pivotal moment, integrating CAL FIRE Technical IMTs into the County EOC in Bishop.

The response involved the EOCs of two counties, Mono and Inyo, along with the CAL FIRE EOC. The CAL FIRE Type II IMT conducted incident response and management activities at the Town level. Initially, the Town was not involved in the decision-making process regarding the establishment of a multi-county IMT/EOC.

While no formal EOC was established at the local level and response continued to flow through the County EOC, the Town played a supporting role in the County's IMT. It established local response operations at the Mammoth Lakes Police Department (MLPD) to manage incidents locally through the working group called the Town Leadership Team, which was convened to maintain local situational awareness, ensure continuity of operations, and request resource support as needed. However, challenges arose concerning the delegation of authority and the roles and responsibilities between the Town and County for USAR activities. Eventually, the Town and County established an Incident Command Post at the theater. At this time, formal response operations with clear lines of communication between Town operations and County-wide operations were established.

Strengths

Strength 1: The Town displayed adaptability by creating a local incident response framework in real time. In response to the long-term emergency, the Town established the Town Leadership Team at the MLPD to manage the emergency, maintain local situational awareness, request needed resources, and support County operations as needed.

Strength 2: Daily communications with the County EOC in Bishop ensured that local efforts were well-informed. Drawing from the successful approach adopted during the COVID-19 pandemic response, the Town attended daily Winter Storm Briefing Meetings with the County in late

February 2023. These meetings facilitated effective information sharing between the Town and County, contributing to coordinated response efforts.

Strength 3: The Town effectively utilized prepositioned state resources. Initially provided with 14 trucks and a loader with an operator for snow trucking operations in mid-March 2023, these resources swiftly expanded to include three loaders with operators, 44 trucks, and several support staff. Additionally, the Town leveraged the structural expertise and guidance of deployed USAR teams.

Areas for Improvement and Recommendations

Area for Improvement 1: At the onset of the emergency, there was a lack of clarity regarding the delegation of authority, responsibilities, and coordination between the County EOC and the State IMTs. Upon the Type I Team's arrival at the County EOC, they found themselves unable to lead response efforts due to a lack of authority from Mono County. Consequently, the IMT could only provide support at the level of shadowing staff when they had to step away for training from their EOC positions. A stakeholder indicated that sending a Type III team with proper delegation of authority to the County EOC in Bishop may have been more effective than sending a Type I team.²

Recommendation: Advocate for the County to develop clear protocols outlining the delegation of authority, responsibilities, and coordination between County and state IMTs. Consider:

- Defining the appropriate type of IMT to be deployed based on the scale and complexity of the emergency.
- Ensuring that all stakeholders understand their roles and responsibilities to avoid confusion during response efforts.
- Conducting regular training sessions and preparedness exercises involving all levels of IMTs (Type I, Type II, Type III) to familiarize personnel with their roles and responsibilities.

Area for Improvement 2: Challenges with real-time information sharing and coordination among response partners impacted decision-making efforts and operational efficiency. Due to the extreme snow conditions, traveling to the EOC could take up to four hours, and some staff were unable to attend in-person briefings. Utilizing online platforms like Zoom or Microsoft Teams for operational communications instead of in-person meetings increases the ability of staff being able to attend if unable to travel.

Recommendation: Encourage the County to utilize online platforms like Zoom and Microsoft Teams to conduct virtual EOC operations and meetings.

Area for Improvement 3: A lack of understanding of ICS and incident response principles negatively impacted response operations. While ICS training used to be conducted annually, this practice was disrupted several years ago, leading to gaps in staff preparedness. Building staff response capacity in the region is challenging due to turnover and the loss of institutional knowledge when staff leave. Although staff can take FEMA ICS courses

² Facilitated Discussion

(100/200/700/800/300/400), there is a need for continued, actionable, and hands-on training in real-world event response.

Recommendation: Develop an integrated preparedness plan or training and exercise plan to document the Town's preparedness priorities for a specific multi-year period. Consider:

- Utilizing existing training materials and guidance, such as the California Specialized Training Institute (CSTI) for command and general staff training for training/education materials.
- Conducting annual refresher training on common ICS courses to ensure staff proficiency and readiness.
- Engaging and collaborating with county, regional, and state training, exercise, and workshop opportunities in addition to locally focused training.

Area for Improvement 4: The documentation and tracking process for reimbursement of incident response costs was unclear. This led to challenges in recouping reimbursement for equipment used and services rendered throughout the response.

Recommendation: Identify and train additional staff in ICS with a focus on documentation management and reimbursement procedures to ensure incident response staff is knowledgeable and prepared for future emergencies. Consider:

- Developing packets of ICS forms and Job Action Sheets that are ready to use, simplifying the documentation process during emergencies.
- Establishing standardized procedures for documentation management during a response to ensure consistency and accuracy in record-keeping.
- Exploring the integration of technology solutions to streamline the documentation process and implement digital platforms or software applications that allow for real-time resource tracking.
- Conducting training and exercises specifically focused on the financial aspects of incident response and recovery, including documentation, material submission, and the cost reimbursement process.

Area for Improvement 5: The current Hazard Mitigation Plan lacks detailed projects aimed at mitigating potential risks and effectively addressing future emergencies. Without detailed projects, the Town may struggle to prepare for and deal with hazards. Adding specific projects tailored to risks will strengthen the plan and help the Town respond better to future emergencies.

Recommendation: Enhance the Town/County Hazard Mitigation Plan by incorporating projects and policy recommendations identified in this AAR. Consider:

- Collaborating with relevant stakeholders, including community organizations, to develop and prioritize mitigation projects aligned with the Town's needs and vulnerabilities.
- Allocating resources and funding to implement prioritized mitigation projects identified in the Hazard Mitigation Plan, ensuring a proactive approach to reducing the community's vulnerability to future emergencies.

Public Information and Messaging

The Town Public Information Officer (PIO) collaborated with the CAL FIRE, Inyo County, and Mono County PIO Teams to collect, coordinate, and disseminate critical public safety information to Mammoth Lakes community members and visitors during the response.

Various tools and methods were employed to ensure widespread dissemination of emergency messaging. Winter storm updates, NWS forecasts, road conditions, shelter locations, sandbag availability, evacuation information, propane and power line safety messages, and other resources, were distributed daily or as necessitated by storm warnings or conditions.

"2022-2023 winter was so overwhelming, the Town did a great job of offering public forums for residents and business people to share their thoughts, grievances, and requests..."

- Survey Response

Table 1: Public Information and Messaging Tools and Methods

Public Information Tool/Method	Description
Townofmammothlakes.ca.gov	TOML website (includes News Flash and Quick Links)
ReadyMono Emergency Alert System (Code Red)	Public subscriber-based alerts (phone, text, email)
Integrated Public Alert and Warning System (IPAWS)	Geo-fenced emergency alerts (phone)
Civic Plus' Notify Me	Subscriber-based alerts (phone, text, email). Lists include Mammoth Media, Public Service Announcements, and Town e-News
Reverse 911	Geographic Information Systems (GIS)-based alerts (phone)
Zonehaven	Evacuations of county areas with Avalanche/Evacuation Warnings for zones tagged yellow/red in the software (web application that connects with alert systems)
KMMT: 106.5 FM, Sierra Wave: 92.5 FM, and KIBS 100.7 FM	Radio stations
Facebook, Instagram, and X (formally Twitter)	Social media
NBC Reno, LA Times, The Weather Channel, NPR	News media outlets

Strengths

Strength 1: The implementation of a virtual Joint Information Center (JIC) enabled Public Information Officers (PIOs) to work remotely, increasing local situational awareness and providing redundancy in communication. Scheduled daily PIO calls at 9:00 AM PST facilitated information sharing and allowed for daily input to a shared "Talking Points" Google Doc, which was distributed daily by the CAL FIRE IMT 2 PIO Team.

Strength 2: The Town used the ready.mono.ca.gov website as a comprehensive “one-stop shop” for incident information. By leveraging this resource, the Town facilitated unified public information and messaging efforts, ensuring that residents and stakeholders could access timely and relevant updates regarding the emergency.

Strength 3: The Town proactively began upgrading its emergency notification system to Genasys Emergency Management (GEM), when faced with delays and disruptions in disseminating critical life safety updates. Recognizing the crucial need for maintaining robust, trusted, and reliable emergency messaging tools, the Town expanded its emergency messaging, operational communications, and situational awareness capabilities through the transition to GEM.

Strength 4: The Town utilized a list of individuals with Access and Functional Needs (AFN) to contact community members ahead of each storm. This approach, developed during the COVID-19 response, demonstrated a proactive commitment to supporting the AFN population. Recognizing many AFN community members expressed a need for assistance in clearing their driveways and walkways of snow; the Town promptly updated websites with snow removal resources and other available support services to address these needs.

Areas for Improvement and Recommendations

Area for Improvement 1: The Town faced challenges in translating important messaging from English to Spanish in a timely manner. While PIOs could swiftly develop and disseminate English-based messaging, there was a pressing need to expedite the translation of critical information. Notably, the translation process experienced delays of one to three days, impacting the timely dissemination of essential public information to Spanish-speaking residents and visitors.³

Recommendation: Establish a process for facilitating rapid access to language translation resources during emergencies. Consider:

- Establishing partnerships with local Spanish-speaking community organizations or individuals to facilitate rapid translation and dissemination of emergency messaging.
- Developing pre-translated templates for common emergency messaging in both English and Spanish.
- Building a roster of Disaster Service Workers (DSWs) that can be utilized to translate simple messaging during an incident.

Area for Improvement 2: The Town did not have the capability to provide services for individuals with hearing impairments. Although American Sign Language interpreters were available through County Social Services and present at shelters, broader and longer-term solutions were absent for local media coverage and press releases.

³ Survey Response

Recommendation: Explore and implement alternative communication methods to reach individuals with hearing impairments for public meetings. Consider:

- Utilizing technologies such as closed captioning and video relay services to enhance accessibility in media coverage and press releases.
- Creating guidelines for producing accessible media content and press releases tailored to individuals with visual or hearing impairments.

Area for improvement 3: The Town lacks the capability to deliver crucial emergency and safety information to visitors. This deficiency posed a significant challenge in ensuring that visitors were adequately informed and prepared to respond appropriately in the event of emergencies while visiting the town.

Recommendation: Explore the installation of permanent digital signage infrastructure, such as Electronic Message Boards (EMBs), Variable Message Signs (VMSs), or Changeable Message Signs (CMSs) to deliver real-time emergency updates, safety instructions, and important information to both residents and visitors. Consider:

- Strategically placing signs at key entry points and high-traffic areas within the town.

Social Services and Sheltering

"The Town took an unprecedented situation and responded very well with limited resources and capabilities. They were the most gracious hosts and ensured we had everything we needed, which wasn't always easy to come by. I was impressed by the various departments' ability to adapt and have a 'can-do' spirit."

- Survey Response

On December 31, 2022, as a large winter storm caused widespread power outages, the Town promptly established a Warming Center at Suite Z, located at 437 Old Mammoth Road.⁴ This center provided vital assistance and resources to residents affected by the adverse weather conditions. Recognizing the growing need for information and guidance, the Town expanded the facility into an Information Center by March 10, 2023, offering support to those seeking updates and assistance during the ongoing emergency.

As the severity of the winter storms increased and snow accumulation became unmanageable in certain areas, the Town took proactive measures to address the escalating situation. A temporary emergency Evacuation Shelter was set up at the Mammoth Middle School gymnasium on March 16, 2023, providing refuge and essential services to displaced

individuals. Additionally, in collaboration with the Mammoth Mountain Community Foundation and Alterra Mountain Company Community Foundation, a Snow Removal Emergency Fund was established to aid residents and businesses in addressing urgent snow removal needs.

Furthermore, to support long-term recovery efforts, a DRC was established at the Mono County Civic Center. This center served as a crucial hub for businesses and homeowners seeking assistance in obtaining SBA loans and accessing other resources to aid in the recovery process following the winter storms. Through these concerted efforts, the Town and its partners demonstrated a commitment to ensuring the safety and well-being of the community amidst challenging weather conditions.

Strengths

Strength 1: Shelter trailers were strategically placed throughout the county to provide shelter to the public. These trailers were meticulously stocked with essential supplies, ensuring that all individuals in need of shelter received not only accommodation but also necessary provisions. Additionally, the shelter team was well-prepared to accommodate additional displaced community members for evacuation if needed.

Strength 2: Shelter staff frequently and effectively performed multiple functions, including managing shelters and developing communications. In addition to managing the shelters and overseeing the well-being of evacuees, shelter staff adeptly handled communication tasks, disseminating vital information to residents and coordinating with emergency response teams. Staffs' ability to perform these diverse functions played a crucial role in ensuring smooth shelter operations and in enhancing overall emergency response efforts.⁵

⁴ Town of Mammoth Lakes, Notify Me "WARMING CENTER NOW OPEN (12/31) @ 5:00pm", December 31, 2023. <https://www.townofmammothlakes.ca.gov/List.aspx?MID=3129>

⁵ Facilitated Discussion

Strength 3: Social Services teams conducted outreach for disaster medical benefits and compiled a comprehensive list of resources for individuals, including those checking into shelters. The Social Services teams compiled a comprehensive list of resources tailored to the needs of individuals, including those seeking refuge in shelters. This proactive approach ensured that evacuees and other community members had access to essential support services during the emergency, enhancing overall disaster response and recovery efforts.

Areas for Improvement and Recommendations

Area for Improvement 1: The limited number of American Red Cross (ARC) and general volunteers in the county posed a significant challenge for shelter staffing and support. With only eight local ARC volunteers, many of whom also work for County Social Services, and ongoing emergencies across California and other states, additional volunteers had to be sourced from various distant locations, including Colorado, Texas, Maine, and Alaska. To ensure proper operation, local staff had to supplement the volunteer workforce, with one to two individuals managing each shelter for 12-hour shifts.

Recommendation: Develop and maintain reserve lists of volunteers within the community who are willing to serve as backup shelter staff during emergencies. Consider:

- Launching targeted campaigns to recruit additional local volunteers for emergency response and shelter staffing.
- Collaborating with community organizations, schools, and businesses to raise awareness and encourage volunteer participation in disaster preparedness and response efforts.
- Partnering with the North County Community Emergency Response Team (CERT) for opening warming and cooling centers.
- Developing job action sheets for shelter operations with clear roles and expectations of shelter staff.

Area for Improvement 2: There is a limited number of pre-identified locations suitable for sheltering. Currently, the Town has only one pre-identified shelter, as the availability of large spaces to accommodate an unpredictable number of people during disasters is constrained. Although Crowley Lake was considered as an alternative shelter location, it presented difficulties in accommodating a large volume of individuals effectively.

Recommendation: Identify and assess additional potential shelter locations within the Town and surrounding areas. Consider:

- Prioritizing spaces that can accommodate a larger number of individuals effectively during disasters.
- Collaborating with local businesses, hotels, schools, and community organizations to establish agreements for using their facilities as emergency shelters when needed.
- Improving the effectiveness of sheltering efforts by ensuring shelter locations are clearly identified and integrated into platforms like Zonehaven.

Area for Improvement 3: Upon activating shelters, the County shelter supply trailer was inaccessible due to snow accumulations. Stakeholders alluded to the fact that upon arrival to set up shelters they were unable to access the County shelter supply trailer due to the accumulated snow around it; this delay in accessing essential supplies impeded the setup and opening of the shelter.

Recommendation: Prioritize snow removal around the County shelter supply trailer and other essential supply storage locations to facilitate rapid access during emergencies. Consider:

- Assigning responsibility for snow removal and establishing clear procedures for timely clearance.
- Coordinating with relevant stakeholders to ensure adequate resources are allocated for snow clearing efforts.

Area for Improvement 4: The Town faced challenges in securing lodging for volunteers and USAR teams due to limited hotel room availability. Traditional lodging spaces were fully operational and occupied by tourists, exacerbating the challenge of finding accommodations for emergency responders. In response to this issue, the Town Manager proposed relocating the public shelter, originally located at the middle school, to accommodate the USAR teams. However, identifying an alternative location for the shelter proved challenging, as the high school was undergoing construction, and the elementary school was deemed unsuitable. Despite repeated requests to relocate the shelter to free up space at the middle school, the lack of viable alternatives posed significant obstacles. Ultimately, arrangements were made to accommodate the USAR team at the existing shelter, albeit with some difficulties and delays.

Recommendation: Identify and evaluate potential temporary shelter locations that can be activated quickly during emergencies to accommodate emergency responders and volunteers. Consider:

- Developing formal agreements with local hotels, businesses, and other organizations to reserve a portion of their accommodations for emergency responders and volunteers during times of crisis.
- Creating contingency plans that outline alternative shelter locations and procedures for relocating shelters when needed.

Area for Improvement 5: The Town lacks a dedicated emergency relief facility for the public. Without a designated facility, the Town lacks a centralized location equipped to efficiently coordinate and distribute essential resources such as food, water, shelter, medical supplies, and other critical aid to those in need. This deficiency hampers the Town's ability to respond promptly and effectively to emergency situations, potentially resulting in delays and inefficiencies in delivering vital relief services to affected individuals and communities.

Recommendation: Construct a dedicated emergency relief facility equipped with essential resources and facilities to serve as a centralized hub for distributing aid, disseminating critical information, and providing a cooling/warming center and community kitchen for the public during emergencies. Consider:

- Co-locating the EOC at this facility, which should include dedicated restrooms, showers, and bunk rooms for responding staff.

Visitation and Business Impacts

During the 2022-23 winter season, Mammoth Lakes Tourism (MLT) continued its tradition of supporting the community during times of crisis. As storms persisted for months and locals grappled with the daunting task of clearing snow, MLT responded to Town Leadership's decision to keep the Town operational by swiftly adjusting its messaging strategy. MLT prioritized the safety of residents and visitors by disseminating **62 emergency messages** across various communication platforms. This strategic effort effectively raised public awareness of the evolving situation without discouraging tourism. The campaign, lasting from mid-January through April 2023, underscored the acknowledgment that the prolonged winter storms could, under different circumstances, be classified as a natural disaster.



Figure 3: Snapshot of crisis communication campaign stats. Source: Mammoth Lakes Tourism

The enduring nature of the winter storms posed significant challenges to local businesses, particularly in terms of access to roads and walkways. Reliant on snow removal operations to clear pathways, businesses faced an uphill battle in ensuring that their premises remained accessible to customers. Compounding these difficulties was the struggle to secure private snow removal services, aggravated by already strained resources. Consequently, many business owners found themselves dealing with exorbitant costs associated with snow removal, with some expenditures reaching tens of thousands of dollars.

Strengths

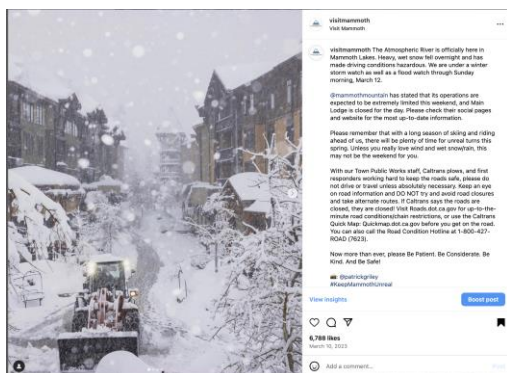


Figure 4: "Be Patient. Be Considerate. Be Kind." Instagram post that reached 51,351 accounts. Source: Mammoth Lakes Tourism

Strength 1: MLT devised a clear and impactful message, urging visitors to embody the values of patience, consideration, and kindness through their campaign, "Be Patient. Be Considerate. Be Kind." Rather than being purely promotional, the campaign took on an educational tone, aiming to inform visitors about what to expect when planning their trip to Mammoth Lakes and encouraging empathetic behavior upon arrival. Through close collaboration with local partners, MLT successfully crafted a unified message that resonated well with both visitors and locals. Despite adverse weather conditions, the community persevered, with community members demonstrating unwavering dedication to their roles. A total of 62 pieces of crisis communication and safety messaging were shared across various platforms such as

social media, newsletters, and the website, reaching approximately 11.9 million individuals on social media alone.⁶

⁶ Mammoth Lakes Tourism, Fiscal Year 22/23 Annual Report.

Strength 2: Community partners established a Snow Removal Emergency Fund to assist residents and businesses in addressing the challenges posed by heavy snowfall. Launched on March 16, 2023, by the Mammoth Mountain Community Foundation and Alterra Mountain Company Community Foundation, this fund aimed to provide financial assistance and coordinate snow removal contractors for residents and businesses facing imminent danger or damage due to heavy snow loads. The fund was accessible to full-time resident-occupied homes and businesses in town, June Lake, or Crowley Lake areas. Recognizing the urgent need for support, the Town Council approved \$200,000 in matching funds during a special Town Council Meeting on March 22, 2023, to ensure the sustainability of the Snow Removal Emergency Fund program amidst overwhelming community demand for assistance.

Strength 3: The Town launched an extreme weather business recovery program to provide much-needed funding for small businesses. The Mammoth Lakes Town Council approved a \$500,000 allocation for this program, aimed at providing grants to small, local businesses significantly impacted by the 2023 Extreme Weather Disaster. Through the Community First initiative, Town funds were invested in these businesses to preserve local jobs, maintain active commercial spaces, prevent blight in commercial sectors, and sustain the local economy. The program offered support funding in the form of grants, with businesses eligible for awards of up to either \$5,000 or \$7,500 each.⁷

Areas for Improvement and Recommendations

Area for Improvement 1: Business owners experienced significant challenges stemming from unplowed streets. This hindered business owners' ability to travel to their business locations and maintain access for guests or patrons. Additionally, the high costs associated with snow removal posed a financial burden for many businesses. Delays in clearing roads, particularly to and from Lakes Basin or due to Highway 395 closures, further exacerbated the situation. The closures and lack of snowplow services impacted customers' ability to reach businesses, leading to disruptions in operations. One respondent in the Business Survey reported that their business was forced to shut down as a result of the winter storms.⁸

Recommendation: Explore options for financial assistance or subsidies to alleviate the burden of snow removal costs on businesses, such as grants or low-interest loans specifically tailored for emergency snow removal efforts. Consider:

- Capturing the documentation and framework created for establishing the Snow Removal Emergency Fund and Extreme Business Recovery Program for use as a template for developing funding options for business owners/residents during future winter weather emergencies.
- Implementing a proactive communication strategy to keep businesses informed about road closures, snow removal schedules, and alternative routes during extreme weather events, minimizing disruptions to operations.

⁷ Town of Mammoth Lakes, Press Release "Town Launches Extreme Weather Business Recovery Program To Provide Much Needed Funding For Mammoth Lakes Small Businesses", May 15, 2023.

https://webapps.mono.ca.gov/ERRR/ready-resources/PSA_TOWN%20LAUNCHES%20EXTREME%20WEATHER%20BUSINESS%20RECOVERY%20PROGRAM%20TO%20PROVIDE%20MUCH%20NEEDED%20FUNDING%20FOR%20MAMMOTH%20LAKES%20SMALL%20BUSINESSES_5-15-2023.pdf

⁸ Survey Response

Area for Improvement 2: Some business owners felt there was a lack of communication between the Town and private businesses. Business owners emphasized the critical need for robust collaboration in emergency planning, training, and exercises. Strong coordination and communication between the Town and private sector entities are vital for enhancing overall preparedness and response effectiveness during emergencies.⁹

Recommendation: Advise businesses of the proper channels to receive information. Develop outreach programs to ensure businesses know where to get up-to-date information. Consider:

- Establishing a dedicated liaison position within the Town Leadership Team to serve as a point of contact for communication and collaboration with local businesses during emergencies.
- Developing a comprehensive communication plan tailored specifically for engaging with businesses during emergencies, including protocols for disseminating critical information and obtaining feedback.
- Conducting in-person forums to engage with the small business community and address the highest impact issues and potential mitigation measures prior to or following the initial response.
- Identify websites and social media accounts that will be used to disseminate information and market this information consistently, utilizing all opportunities.
- Utilize the Mammoth Lakes Chamber of Commerce text alert system to rapidly disseminate emergency information and ensure timely communication with businesses.

⁹ Survey Response

Fire and Public Safety Response

During the Winter Storms response, Mammoth Lakes Fire Protection District (MLFPD) and MLPD assumed multifaceted roles beyond their regular public safety duties. Their involvement encompassed crucial support for County EOC operations, dissemination of essential public information, active participation in snow removal endeavors, and thorough building inspections facilitated by state-provided resources. Among the array of challenges faced, MLFPD identified propane explosions as a primary public safety concern, recognizing the vulnerability of approximately 300 buildings to such incidents, as elaborated in the Propane/Utilities Issues section. Concurrently, MLFPD and MLPD collaborated closely with a spectrum of structural and USAR partners to mitigate the threat of structural collapse attributed to the accumulation of heavy snow and ice. A partnership with Cal OES facilitated the provision of SAP training to MLFPD and Town personnel. This training increased the local capacity to conduct safety assessments of buildings and facilities.

"...every facet of the Town I worked with (Police, Fire, Town Leadership) was amongst the most professional, welcoming, and easily displayed an 'adapt and overcome' attitude with limited resources and isolation. The Town should be proud of the people tasked with public safety."

- Survey Response

Strengths

"I really appreciated all the collaboration and connection. ... I felt well communicated with. Chief Tomaier did an outstanding job with the resources that he has available and was still working on other things like the AFN population, volunteer staff, and mental health."

- Survey Response

Strength 1: MLFPD, MLPD, and USAR teams worked collaboratively to prioritize life safety amidst the challenging conditions posed by the Winter Storms. Together, they responded to a total of 142 reported propane leaks, mitigating potential risks to residents and properties. Additionally, the teams effectively managed two significant propane explosions and two incidents of structural collapse, showcasing their resilience and adaptability in navigating the complex landscape of severe winter weather conditions. Despite encountering access challenges exacerbated by heavy snowfall and the discovery of unmapped utility locations, MLFPD, MLPD, and USAR teams remained steadfast in their mission to ensure the safety and well-being of the community throughout the emergency response period.

Strength 2: MLFPD and Emergency Medical Services (EMS) maintained consistent communication with Mammoth Hospital, ensuring situational awareness of ongoing and future response activities. This consistent and transparent communication facilitated a shared understanding of the evolving situation and allowed for effective coordination of ongoing and future response activities. By keeping Mammoth Hospital informed of pertinent developments, MLFPD and EMS ensured that the hospital remained well-prepared to provide necessary medical support and resources to the community as needed.

Strength 3: Fire hand crews and additional engine companies were used effectively to dig out fire hydrants and propane tanks from snow. Leveraging the existing map of fire hydrant locations maintained by the MLFPD, these teams were able to promptly identify and prioritize snow

clearing. Crews also worked to clear snow from propane tanks and to facilitate roadway and walkway access for emergency responders. This work benefited from systems built and shared by the Mammoth Community Water District.

Areas for Improvement and Recommendations

Area for Improvement 1: The MLFPD Fire Chief juggled dual roles at the County and Town levels, posing a challenge to prioritize the Town's versus the County's response efforts. This issue persisted from previous emergencies, such as the COVID-19 response, reflecting the ongoing strain on staff availability for managing incident response roles.¹⁰ Compounded by the MLFPD's limited fire capabilities as a combination/volunteer agency with minimal full-time staff, the region's reliance on scarce supporting fire resources further exacerbated the challenge. With Mono County lacking a dedicated fire department and limited mutual aid resources available for widespread incidents, coordination with Cal OES and CAL FIRE became imperative but also posed logistical hurdles.

Recommendation: Explore options to increase firefighting capacity of MLFPD through increased staffing, training, and equipment acquisition. Consider:

- Developing a comprehensive staffing plan for prolonged events including volunteers and Town employees.
- Exploring agreements between fire districts to create a Type III Team and identify individuals who can step into that leadership role(s).
- Engaging local retired federal subject matter experts (such as U.S. Forest Service retirees) and the Fire Chief's Association to form an All Hazards Team to participate in the Town's preparedness and incident response activities.
- Advocating to the County for EOC/fire operations to be a rotating position if one is not appointed.

Area for Improvement 2: In the initial response phases, maintaining accountability and effective communication with USAR teams presented significant challenges. Coordination efforts were hindered as multiple agencies operated separate USAR teams independently rather than collaborating and integrating their efforts. This fragmented approach led to inefficiencies and duplication of efforts, hampering the overall effectiveness.

Recommendation: Develop standardized reporting protocols and procedures for USAR teams to regularly communicate their locations, activities, and resource needs. Consider:

- Implementing a centralized reporting system to facilitate real-time information sharing and improve situational awareness among all involved stakeholders.
- Organizing joint training exercises and drills involving multiple agencies and USAR teams to enhance interoperability, build relationships, and improve coordination during emergency situations.

¹⁰ Facilitated Discussion

Area for Improvement 3: The Town experienced delays in requesting and receiving critical resources and equipment. This issue arose due to the absence of a pre-determined list detailing the required items, their specifications, and availability. This lack of preparedness resulted in delays in procuring essential resources, impacting the timely execution of response activities.

Recommendation: Develop and maintain a comprehensive inventory of critical resources and equipment required for emergency response, including their specifications and availability, to facilitate swift procurement during crises. Consider:

- Establishing pre-determined agreements or contracts with suppliers for essential resources and equipment, ensuring availability and expedited delivery in emergency situations.
- Purchasing two to four snowmobiles with toboggan attachments or snowcats for MLFPD to ensure the capability to evacuate/transport individuals from areas that vehicles cannot reach due to snow or road closures.

Area for Improvement 4: MLFPD lacks comprehensive protocols specifically designed to address the hazards associated with propane in potentially explosive environments. This deficiency hindered the fire department's ability to effectively respond to propane-related incidents.

Recommendation: Establish clear and standardized operating procedures for MLFPD personnel when dealing with propane emergencies, including protocols for assessing, containing, and mitigating propane leaks or explosions. Consider:

- Collaborating with propane industry experts and regulatory agencies to review and enhance existing safety protocols and incorporate best practices into MLFPD's response procedures.
- Providing comprehensive training to MLFPD personnel on the propane safety and response protocols established.
- Conducting regular exercises to ensure MLFPD personnel are proficient in implementing the procedures during emergencies.
- Continuously evaluating and updating the procedures based on lessons learned from real-world incidents and evolving industry standards.

Transportation and Snow Removal

Emergency trucking operations commenced on March 15, 2023, with support from Cal OES, providing essential resources to the region. Initially, the Town received 14 trucks, a loader, and an operator through this program. Subsequently, the resources expanded to include three loaders, 44 trucks, and additional support staff, concluding efforts on April 7, 2023.

Upon initiating the trucking operation, the Town prioritized creating more snow storage for future storms and enhancing visibility at intersections. The primary focus, however, remained on widening roads to improve access for EMS, establish safer travel routes, and enhance drainage infrastructure for the impending spring melt.

Shortly after widening Forest Trail and Canyon Boulevard, an explosion at Val D'Iserre occurred on March 22, 2023. EMS swiftly accessed the site with the necessary personnel and equipment, underscoring the importance of the road-widening efforts. Additionally, teams comprising loaders, trucks, and inmate crews collaborated with MLFPD to access over 100 fire hydrants.

Throughout the program's duration, the Town transported more than **5,700 truckloads** of snow to designated snow pits, totaling **57,170 cubic yards**. This volume, estimated to be about 15,000 tons or 4,625,000 gallons, alleviated pressure on Mammoth Lakes' storm drain system.¹¹

"The team's creativity and ability to adjust on the fly were integral to the Town's successful response. On the snow removal and trucking operations side, we did everything we possibly could to make our streets as safe as possible. It was a **monumental effort**, and Town staff stepped up to the challenge."

- Survey Response

Strengths



Figure 5: Snow trucking operations unloading snow at the snow storage site.

Strength 1: During peak snowfall periods with limited equipment and personnel, the Town swiftly adapted to severe and changing conditions, ensuring road accessibility and safety. Leveraging both private contractors and state-provided resources, a total of 5,717 truckloads and 57,170 yards of snow were swiftly removed. This strategic utilization of private contractor resources effectively supported snow removal operations.

Strength 2: The Town proactively facilitated snow removal operations on sidewalks and walking trails, enabling pedestrians to navigate through adverse conditions without relying on vehicles. By

prioritizing the upkeep of sidewalks and trails, the Town ensured that individuals could move around efficiently, regardless of the challenges posed by snow accumulation.

¹¹ Cal OES, Snow Removal Operation Summary Report, April 12, 2023.

Strength 3: The Town, in response to diesel shortages for private snow removal, demonstrated resilience by promptly transporting diesel from Mono and Inyo Counties. Despite facing challenges, such as frustration from fuel stations, the Town took proactive measures to ensure the availability of fuel. Upon being notified of the situation, the Town organized shuttles to transport diesel from Bishop to supply stations and operators. This proactive response mitigated potential disruptions, although it required significant efforts from the JIC to address rumors and misinformation.

Areas for Improvement and Recommendations

Area for Improvement 1: Delays in the procurement of essential snow removal resources occurred due to the lack of a standardized list outlining equipment specifications. Without a comprehensive reference, the process of requesting and acquiring necessary resources through the IMT/EOC was protracted. Significant time was spent identifying specific equipment requirements to fulfill resource requests, contributing to overall delays in the response effort.

Recommendation: Develop a standardized list of snow removal equipment and specifications to streamline the process of requesting and acquiring necessary resources during emergencies. Additionally, request a list of available equipment from CAL OES to ensure adequate preparedness for future winter storms. Consider:

- Establishing pre-determined agreements or contracts with snow removal equipment providers to expedite the procurement process during emergencies.
- Establishing a cache of snow removal tools and framing material to deploy quickly in future responses.

Area for Improvement 2: The Town faced difficulties in plowing and maintaining narrow roadways and parking areas in high elevations due to lack of snow storage. As snow accumulation persisted, the limited availability of designated snow storage areas hindered snow removal operations, leading to congestion and reduced accessibility in these areas.

Recommendation: Develop plans to increase snow storage capacity in high-elevation areas by identifying additional storage locations or optimizing existing ones. Consider:

- Acquiring land for designated snow storage areas or implementing innovative solutions such as snow melting systems.

Area for Improvement 3: Mapping applications like Google Maps, Apple Maps, and Waze inadvertently directed visitors and residents to closed, damaged, or impassable roads. For instance, a section of U.S. 395 was closed due to avalanches north of Lee Vining, remaining shut for weeks. Despite the closures, these routes continued to display as "open" on the apps, causing confusion and inconvenience. Additionally, avalanches triggered power outages in communities north of Mono Lake, such as Mono City and Bridgeport. Other road closures resulted in isolation for visitors and residents, leading to temporary shortages of food and fuel. The apps only updated road statuses after a considerable delay, exacerbating the situation.

Recommendation: Explore the integration of emergency response data directly into popular navigation apps, enabling automatic updates on road closures and hazardous conditions.

Area for Improvement 4: The Town, Caltrans, and Mono County experienced challenges in coordinating service sharing effectively. Resource sharing between these entities was hampered by a lack of formal mutual aid agreements. Solidifying such agreements would help improve efficiency and strengthen response capabilities during emergencies.

Recommendation: Develop a formal mutual aid agreement between the Town, Caltrans, and Mono County to facilitate efficient sharing of services during emergencies and high-impact events. Consider:

- Outlining clear protocols, responsibilities, and resource-sharing mechanisms to ensure seamless coordination and mutual support in times of need.

Building and Structural Issues

The heavy snow and ice accumulation on buildings and residences in Mammoth Lakes posed a significant risk of structural collapse, prompting proactive inspections to assess building integrity. To streamline this process, an inspection database using QuickBase was established and utilized by MLFPD and state-provided resources.

Out of **850 inspections** conducted, a total of **645 tags** were issued (some structures received multiple tags), affecting 398 buildings. Public surveys reporting damage totaled 336, with not all resulting in inspections or tags. In terms of building permits, 317 repair permits were submitted and 298 issued in 2023, compared to 46 submitted and 40 issued in 2022.

"There was lots of cross-training between the USAR teams and Mammoth Lakes Fire, and that free flow of information was informative to all of us. MLFPD was able to adapt to building structural failures with the information we received."

- **Survey Response**

During the 2022-23 winter season, Mammoth Lakes faced a series of structural challenges. First, on March 14, 2023, the Mammoth Mall parking garage buckled under the immense weight of accumulated snow, resulting in damage to parked vehicles. Thankfully, no injuries were reported. However, the impact was significant, setting the stage for further disruptions.

Tragically, the string of incidents continued when, on March 22, 2023, a propane explosion rocked the Val D'Iserre Condominium, leading to its collapse. The explosion sent shockwaves through the area, prompting emergency response efforts and highlighting the urgent need for structural reassessment amidst the ongoing winter emergency.

As the storms persisted the town grappled with the aftermath of extensive property damage caused by excessive snow loads. With 16% of damaged homes, approximately **77 residents** found themselves displaced, and numerous businesses experienced severe disruptions, exacerbating the strain on the community.

Strengths



Figure 6: Responder conducting a building and structural inspection.

Strength 1: The Town streamlined building and structural activities into an integrated database and application using QuickBase for field data collection. With the support of state resources, a total of 850 inspections were completed. Dedicated IT staff played a crucial role in developing the integrated database and applications, enabling effective management of recovery efforts by documenting damaged structures and coordinating data from various organizations and resources.¹² Of the 850 inspections conducted, 205 were performed by state resource agencies, although they did not result in recording building tags in the Town's

¹² Survey Response

system. Nonetheless, some evacuations were necessary. Subsequent follow-up inspections by Town inspectors were conducted to appropriately tag the impacted structures, ensuring accurate documentation and assessment of damage.

Strength 2: The Town expanded its workforce trained in utilizing Cal OES' SAP system for building inspections through training provided by the state. This initiative bolstered the Town's capacity to conduct thorough and efficient structural assessments. Additionally, the Town received valuable support from experienced and specialized USAR teams, facilitating seamless coordination of building and structural activities during the emergency response efforts. The SAP training proved immensely beneficial for inspectors, offering clear standards for structural assessment and ensuring consistency in evaluation practices. All eligible staff members underwent one-on-one training sessions, equipping them with the necessary skills to effectively utilize the SAP system and contribute to the Town's inspection efforts.

Areas for Improvement and Recommendations

Area for Improvement 1: Confusion among response partners regarding tagging procedures and inspection coding post-inspection hindered operational efficiency and communication. Initially, inconsistencies in tagging systems across different agencies led to confusion, highlighting the necessity for standardized procedures. Additionally, challenges arose in determining appropriate responses to structural damage reports, underscoring the need for clearer guidance and protocols.

Recommendation: Develop clear and consistent tagging procedures for identifying and documenting structural damage across all response agencies involved in emergency operations. Consider:

- Developing comprehensive guidance documents outlining procedures for response partners to follow when conducting inspections.
- Implementing improved communication protocols to facilitate efficient exchange of information among response partners regarding inspection coding, tagging procedures, and follow-up actions.
- Updating the system to be more user-friendly and error-tolerant regarding data collection and insertion by using dropdown lists and checkboxes.
- Updating the database so responders are tagging data in the same system as building permit data to eliminate the manual labor of connecting the two.

Area for Improvement 2: The Town encountered challenges due to the absence of a comprehensive documentation follow-up process for the outcomes of building tagging and resolution activities. Following the completion of building inspections and tagging procedures, there was a lack of a structured system to document and track the subsequent permitting actions and resolution efforts. This led to difficulties in maintaining a clear record of the status of tagged structures and the progress of necessary repairs or mitigation measures. As a result, there was a risk of oversight or inefficiency in addressing identified structural issues and ensuring compliance with regulatory requirements.

Recommendation: Establish clear and standardized documentation procedures for building tagging and resolution activities, outlining the necessary steps and information to be recorded for each tagged structure.

Area for Improvement 3: Public confusion arose regarding the damage reporting process due to conflicting messages conveyed to the community. One message suggested that submitting damage reports could aid in obtaining financial relief assistance, while another advised reporting damages for property inspection to ensure safety. This discrepancy led to ambiguity, with some individuals seeking financial support without desiring property inspection for habitability or permit requirements.¹³

Recommendation: Ensure public messaging regarding public survey/damage reporting is consistent and clearly outlines the purpose and process, distinguishing between financial assistance and property inspection requirements.

Area for Improvement 4: Building codes and community standards were not adequate to address the significant snow loads and propane infrastructure deficiencies. This deficiency in regulatory measures left buildings vulnerable to structural damage and increased the risk of propane-related incidents during severe weather events. There was a notable gap in regulations governing building construction and propane infrastructure maintenance, particularly concerning the resilience of structures against heavy snow loads and the safety of propane storage and distribution systems.

Recommendation: Review and update building codes to incorporate provisions for structures to withstand heavy snow loads, ensuring structural integrity during severe weather events. Consider:

- Revising regulations related to propane infrastructure to address deficiencies identified during the emergency.
- Developing plans and standards to implement isolation valves for underground propane infrastructure, residential tank remote shutoffs, and retrofits for emergency shutoffs for existing commercial and residential properties.
- Conducting comprehensive risk assessments to identify vulnerable areas and structures susceptible to snow-related hazards and propane infrastructure failures.

¹³ Survey Response

Propane/Utilities Issues

The prolonged winter weather event had significant impacts on both electric and gas utility services. Southern California Edison (SCE) demonstrated proactive and effective response measures, maintaining communication with Town personnel and implementing pre-determined trigger points to activate IMTs in areas experiencing power outages.

Regarding propane gas services, Mammoth Lakes relies on two utility companies, AmeriGas and Eastern Sierra Propane. AmeriGas operates a unique pipeline infrastructure covering much of the Town. However, heavy snow and ice accumulation on propane tanks and lines led to dangerous situations, resulting in two propane explosions in residential areas. MLFPD responded to **138 propane-related calls** between February 1 to April 30, 2023.¹⁴

Val D'Iserre Condominiums Explosion

At 9:23 AM PST on March 22, 2023, an explosion rocked the Val D'Iserre Condominiums located at 194 Hillside Drive in Mammoth Lakes. First responders arrived to find a building collapsed near the pool area. Two workers from the complex were visible, one of whom required extraction from the snow and debris. Both individuals were transported to Mammoth Hospital for further evaluation.

During the rescue operation, a man approached first responders, informing them that his wife and son were trapped inside their residence. Rescuers navigated around the northwest side of the collapsed structure to reach them. The son was found in the bedroom area and transported to Mammoth Hospital for evaluation, while the wife was located in the kitchen area and airlifted to Sierra Life Flight at Mammoth Yosemite Airport.



Figure 7: MLFPD and USAR teams responding to the Val D'Iserre Condominiums Explosion site.

USAR teams and Eastside K-9 units were also present, conducting thorough sweeps for any additional victims amidst the wreckage. Agencies who responded to the incident included:

- Bishop Fire Department
- CAL FIRE
- Cal OES
- California Highway Patrol
- Carlsbad Fire Department
- Eastside K-9
- Los Angeles County Fire Department
- Los Angeles County Sheriff's Department
- Mammoth Mountain Ski Patrol
- MLFPD
- MLPD
- Mono County EMS

¹⁴ Firehouse Report Code 412

- Mono County Sheriff's Office
- Murrieta Fire & Rescue
- Pasadena Fire Department
- Riverside County Fire Department
- San Diego Fire-Rescue Department
- San Marcos Fire Station 1
- Santa Fe Spring Fire Department
- Sierra Lifeflight

Juniper Road Explosion



Figure 8: MLFPD responding to the structural explosion on Juniper Road.

On April 1, 2023, around 1:30 AM PST, a propane explosion impacted a single-family home located in the 200 block of Juniper Road. The blast likely triggered a structural fire, prompting the evacuation of neighboring residences. The ensuing fire caused snowmelt flooding, leading to the evacuation of a nearby condominium complex.

MLFPD and AmeriGas personnel swiftly conducted propane safety inspections, shutting off propane services to several properties in the vicinity. Affected property owners were instructed to contact AmeriGas directly for updates on service restoration. Additionally, AmeriGas proactively reached out to customers via phone to provide timely updates on the

situation. Agencies who responded to the incident included:

- Bishop Fire Department
- CAL FIRE
- CAL FIRE Office of the State Fire Marshal Arson & Bomb Investigators
- Carlsbad Fire Department
- Chula Vista Fire Department
- City of San Diego Fire-Rescue Department
- Cal OES
- Los Angeles County Fire Department
- MLFPD
- MLPD
- Mono County EMS
- Murrieta Fire Department
- Oakland USAR California Task Force 4
- Owens Valley Conservation Camp #26
- Pasadena Fire Department
- Riverside Fire Department
- San Bernardino/Inyo/ Mono Unit
- San Marcos Fire Department
- Santa Barbara City Fire Department

Strengths

Strength 1: In response to the April 1, 2023 explosion on Juniper Road, the MLFPD Fire Chief and Town's PIO took proactive steps to disseminate crucial safety information and snow management resources to the public. This information was prominently featured on the Town's website under the dedicated 2023 Snow Damage Resources webpage, ensuring easy access for residents seeking updates. The resources provided encompassed a range of important topics including propane safety, snow and ice mitigation strategies, and informational resources. Furthermore, the PIO utilized multiple communication channels by sending a Notify Me notification to the public and posting the update on the Town's official Facebook page, ensuring widespread dissemination of critical safety information.¹⁵

Publicly released resources included:

- Propane Safety Video
- Winter Storm Damage Assessment Form
- Snow Removal Emergency Fund
- Return to Occupancy Information
- Heavy Snow Load Information
- List of engineers/designers

Strength 2: SCE served as a proactive and communicative incident partner, demonstrating a swift and effective response to mitigate electrical hazards during the crisis. SCE promptly deployed IMTs upon reaching pre-determined triggers, ensuring the prepositioning of teams and resources to address anticipated needs in the affected area. These proactive measures played a crucial role in minimizing the impacts on public safety, essential services, and critical infrastructure. The Town commends SCE for its unwavering commitment to proactive emergency management and acknowledges the invaluable 24/7 access to communication with SCE both before and during critical incidents.

Strength 3: The Town implemented a streamlined approach to its building tagging database within QuickBase by incorporating a dedicated propane option. This enhancement allowed for the inclusion of specific notes pertaining to propane-related issues, thereby addressing a notable gap in the system's functionality. By facilitating the integration of propane-related data and enabling the addition of pertinent notes, this modification significantly reduced confusion among departments. Particularly noteworthy was the improvement in clarity when buildings were red-tagged without accompanying information, a capability that was previously absent from the system.

Areas for Improvement and Recommendations

Area for Improvement 1: Prolonged disruptions in phone and internet services revealed a critical gap in emergency response capabilities. With Verizon serving as a primary telephone provider east of the Sierra Mountains and playing a crucial role in internet connectivity, the absence of a dedicated liaison can exacerbate the impact of service outages. Coordination with Verizon, alongside other service providers such as AT&T, Suddenlink, Frontier Communications, and Hughes Net, is essential for effective emergency planning and operations. Improved engagement with these partners can enhance coordination, bolster communication systems, and mitigate the consequences of service interruptions during emergencies.

¹⁵ Town of Mammoth Lakes, Notify Me: "HOUSE EXPLOSION ON JUNIPER ROAD IN MAMMOTH LAKES", April 1, 2023. <https://www.townofmammothlakes.ca.gov/List.aspx?MID=3271>

Recommendation: Invest in redundant communication systems and infrastructure to minimize the impact of service disruptions. Consider:

- Identifying telecommunications partners' points of contact and including them in emergency planning, training, and exercises.
- Implementing robust coordination protocols with telecommunications partners to ensure seamless communication and information sharing during emergencies.

Area for Improvement 2: The accessibility and responsiveness of propane providers via the local emergency dispatching system posed significant challenges during propane hazard incidents.

Town staff encountered difficulties in reaching utility providers promptly to relay critical public safety concerns and coordinate response efforts. Using a general hotline instead of direct lines hampered communication with partners like AmeriGas, resulting in delays in sharing operational and public safety information. It's important to acknowledge that adverse weather conditions and the severity of the long-term snow event affected the availability and timeliness of utility IMT personnel in responding to incidents. In some instances, personnel faced travel restrictions or significant delays in reaching incident sites, further impeding response efforts.

Recommendation: Encourage propane providers to establish a dedicated emergency response protocol, including sharing a direct contact number for the Town to use during emergencies. Ensure that personnel and resources are readily available and staged in the area during times of increased hazard to respond promptly to emergency situations.

Area for Improvement 3: Unknown locations and mapping of propane tanks and lines caused significant delays in snow clearing and rescue operations. The intricate and expansive pipeline infrastructure of AmeriGas, coupled with unidentified cutoff valve locations, led to confusion and delays in gas shutdown procedures by MLFPD. This was particularly evident during the response to the Val d 'Isere Condominiums explosion in the Sierra Nevada. Existing infrastructure systems may not have adequately addressed the risks associated with abnormal snow and ice accumulation on gas distribution systems. It is imperative to accurately identify and map the locations of utility infrastructure to ensure timely arrival of first responders and swift mitigation of hazards. Due to a lack of up-to-date information, first responders were forced to rely on outdated Google satellite images, significantly impeding their ability to locate gas shutoff points and effectively manage the incident.

Recommendation: Coordinate with providers to invest in advanced technology solutions, such as real-time GIS mapping tools, to provide accurate and up-to-date information on utility infrastructure locations and flow during emergencies.

Area for Improvement 4: The limited transparency and collaboration from certain propane providers regarding incident data, communication protocols, emergency plans, and response procedures impeded the Town's ability to respond to and recover from incidents effectively. This deficiency poses ongoing risks to the safety and well-being of community members, visitors, and responders. An illustrative case occurred before the 2022-23 Winter Storms, exemplified by a three-tank explosion on Old Mammoth Road in January 2017. During this incident, AmeriGas technicians were unaware of existing propane leaks caused by snow pressure while attempting to refill tanks, highlighting the critical need for improved communication and awareness.

Recommendation: Encourage propane providers to adhere to the recommendations outlined in the Mono County Grand Jury Final Report.

Conclusion

Implications for Future Winter Storm Response

The insights gained from the various findings underscore the critical importance of strategic planning and resource allocation for future winter storm response efforts. The comprehensive analysis of strengths, areas for improvement, survey insights, and stakeholder feedback provides a roadmap for enhancing preparedness and response capabilities.

It is clear that the Town must prioritize enhancing its snow removal capabilities and infrastructure to effectively manage unprecedented snow volumes and minimize disruptions. This includes strategic investments in equipment, proactive maintenance programs, and updated protocols for efficient snow removal operations. Moreover, improving communication and coordination among stakeholders, including utility providers and emergency services, is paramount to ensure cohesive emergency operations and timely responses to various incidents.

Additionally, there is a need to improve communication strategies with residents and visitors to enhance public awareness, safety, and preparedness during winter storms. Establishing dedicated emergency relief facilities with essential resources can serve as centralized hubs for aid distribution, critical information dissemination, and providing shelter and support during emergencies. Moreover, developing comprehensive hazard mitigation plans with detailed projects aimed at mitigating potential risks is crucial for strengthening the Town's resilience and preparedness.

In conclusion, by implementing the recommendations discussed and addressing the identified areas for improvement, the Town can significantly enhance its capacity to respond to and recover from future winter storms. This proactive approach will safeguard the community, infrastructure, and well-being of residents and visitors, ensuring a more resilient and adaptive response to extreme weather events in the future.

A Call to Action to Utility Providers

To mitigate the risk of explosions and potential damage caused by snow and ice accumulation on pipeline facilities, gas utility providers must take proactive measures to address safety risks. These efforts should be well-documented and integrated into existing plans, policies, procedures, and training programs.

The February 11, 2016, Pipeline Safety Advisory Bulletin (Docket No. PHMSA-2016-0013) by the Pipeline and Hazardous Materials Safety Administration emphasizes the importance of preventing damage to gas distribution systems from abnormal snow and ice build-up. Regardless of regulatory oversight by the Pipeline and Hazardous Materials Safety Administration or state agencies, utility providers should heed the recommendations outlined in the bulletin to safeguard the community and protect residences, facilities, services, and infrastructure.¹⁶

¹⁶ Pipeline and Hazardous Materials Safety Administration; Department of Transportation, Pipeline Safety: Dangers of Abnormal Snow and Ice Build-Up on Gas Distribution Systems, February 11, 2016.

Appendices

Acronyms

Table 2: Acronyms

Acronym	Description
AAR	After-Action Report
AFN	Access and Functional Needs
ARC	American Red Cross
CERT	Community Emergency Response Team
CSTI	California Specialized Training Institute
DRC	Disaster Recovery Center
EMS	Emergency Medical Services
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
GEM	Genasys Emergency Management
GIS	Geographic Information Systems
IMT	Incident Management Team
IP	Improvement Plan
IPAWS	Integrated Public Alert and Warning System
JIC	Joint Information Center
MLFPD	Mammoth Lakes Fire Protection District
MLPD	Mammoth Lakes Police Department
MLT	Mammoth Lakes Tourism
NWS	National Weather Service
PIO	Public Information Officer
SAP	Safety Assessment Program
SBA	Small Business Administration
SCE	Southern California Edison
USAR	Urban Search and Rescue

References

1. Cal OES, Snow Removal Operation Summary Report, April 12, 2023.
2. Facilitated Discussions
3. Firehouse Report Code 412
4. Mammoth Lakes Tourism, Fiscal Year 22/23 Annual Report.
5. Mammoth Mountain Ski Patrol Storm Summaries | 18/19-22/23
6. Pipeline and Hazardous Materials Safety Administration; Department of Transportation, Pipeline Safety: Dangers of Abnormal Snow and Ice Build-Up on Gas Distribution Systems, February 11, 2016. <https://www.federalregister.gov/documents/2016/02/11/2016-02704/pipeline-safety-dangers-of-abnormal-snow-and-ice-build-up-on-gas-distribution-systems>
7. Survey Responses
8. Town of Mammoth Lakes, Notify Me "WARMING CENTER NOW OPEN (12/31) @ 5:00pm", December 31, 2023. <https://www.townofmammothlakes.ca.gov/List.aspx?MID=3129>
9. Town of Mammoth Lakes, Notify Me: "HOUSE EXPLOSION ON JUNIPER ROAD IN MAMMOTH LAKES", April 1, 2023. <https://www.townofmammothlakes.ca.gov/List.aspx?MID=3271>
10. Town of Mammoth Lakes, Press Release "Town Launches Extreme Weather Business Recovery Program To Provide Much Needed Funding For Mammoth Lakes Small Businesses", May 15, 2023. https://webapps.mono.ca.gov/ERRR/ready-resources/PSA_TOWN%20LAUNCHES%20EXTREME%20WEATHER%20BUSINESS%20RECOVERY%20PROGRAM%20TO%20PROVIDE%20MUCH%20NEEDED%20FUNDING%20FOR%20MAMMOTH%20LAKES%20SMALL%20BUSINESSES_5-15-2023.pdf

Acknowledgments

Special thanks to the many individuals who contributed to the production of this report, generously sharing their time and expertise despite their busy schedules.

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