

Prepared by:



IMPORTANT: The recommendations in this report are not necessarily those of Madbury Fire Chief Perley or the Madbury Select Board. The information contained in this report will be used in future discussions about how to improve Madbury's fire protection services.

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March 2024

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NOTE: May 15, 2024. This report contains requested amendments, including a Summary of Recommendations and an additional map with Madbury response times. (shown in the table of contents)

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Addendum Map of Madbury Response Times





Town of Madbury Fire Department Consolidation Analysis

Summary of Recommendations

Option 1 – Continue with a Volunteer Department

The Madbury Fire Department engages in an extensive recruitment and retention program with the goal of increasing staffing and hiring a full-time Fire Chief to manage the recruitment and increase volunteers.

Cost: Increase Budget to \$294, 270

Disadvantage: Recruiting new volunteer firefighters can be a challenging task. It takes consent effort to find them, hire them, and retain them. This is a national problem with no end in sight. Even with a recruiting campaign by a full-time fire chief and additional expenses, this option may not be successful.

Advantage: Least Expensive Option

Option 1B – Develop a Student Live-In Program

A student Live-in program could add additional firefighters to respond to emergencies.

Cost: Increase Budget to \$294, 270

Increase Capital Budget by \$1,000,000

Problem: Developing a student Live-in program is a time-consuming proposition and difficult to manage. Again, even with a full-time fire chief and additional expenses, this option may not be successful.

Advantage: Long-term cost-effective option

Option 2 – Transition to a Combination Department

Option 2A – Full Coverage 24/7 – 3 Person Engine Company

Hire personnel to staff the Madbury fire station 24/ 7, including a full-time Chief.

Cost: Increase Budget to \$1,482,721.92

Increase Capital Budget by \$1,000,000

Disadvantage: The cost may be prohibitive and recruiting and retaining full-time employees may be difficult.

Advantage: Provides full-time 24/7 coverage

Option 2B – Modified Coverage

Staff the Madbury fire station with a combination of full-time and part-time firefighters to provide coverage 24/7.

Cost: Increase Budget to \$657,407

Increase Capital Budget by \$1,000,000

Problem: The cost may be prohibitive and recruiting and retaining full-time and part-time employees may be difficult.

Advantage: Provides full-time 24/7 coverage

Option 3 – Contract with Neighboring Community

Option 3A – Contractor Staffs Madbury Station

Contract with a neighboring community to staff the Madbury Fire Station 24/7.

Cost: Between \$1,250,000 and \$1,550,000 annually

Increase Capital Budget by \$1,000,000

Problem: The cost may be prohibitive.

Advantage: Provides full-time 24/7 coverage

Option 3B – Contractor Response from Own Station

Contract with a neighboring community to provide fire protection and emergency services to the community from their existing station.

Cost: Between \$350,000 and \$700,000

Problem: Although more cost-effective than most options. It does significantly increase the existing budget.

Advantage: Provides full-time 24/7 coverage at the lowest possible cost with a decrease in response times

Town of Madbury Fire Department

Consolidation Analysis

March 2024

I. INTRODUCTION

MRI (Municipal Resources, Inc.) was engaged by the Town of Madbury, New Hampshire to undertake a comprehensive and objective assessment of the configuration, deployment, and options for regional collaboration/consolidation with a neighboring community. This assessment will evaluate the organization, effectiveness, and overall efficiency of service level, staffing, training, and sustainability of the current service model, and evaluate the potential of a regional collaboration/consolidation between the City of Dover or the Towns of Durham and Barrington with the Town of Madbury. The primary intent and goal of this project is to conduct a comprehensive assessment of the department to develop an appropriate forward-looking collaboration plan. This project will consider whether deployment patterns are adequate to provide a level of service within the Town that is in line with generally accepted standards and benchmarks for safety used by comparable fire departments in comparable communities and based on standards and best practices for modern-day fire services currently in practice in New Hampshire and the United States.

The study will focus on the following areas: The goal of this project is to outline and evaluate the options for a consolidated fire service delivery system by contracting with a neighboring community for fire department services, which could result in the following:

- Continued alignment with community needs/desires.
- Enhanced use of limited resources
- Increased response efficiency
- Improved personnel safety at the emergency scene

MRI is a firm dedicated to providing professional, technical, and management support services to municipalities and schools throughout New England and the Northeast. We are an established New Hampshire corporation and provide local government management consulting, recruitment, and selection services to municipal governments, fire departments, police departments, public works departments, libraries, schools, and other government agencies. Among the areas of expertise available are department assessments, organizational studies, personnel recruitment, personnel administration, collective bargaining, community and economic development, budget/finance, and general management. MRI has a particularly strong public safety group with nationally recognized expertise in police, fire, and emergency services.

MRI, a New Hampshire Corporation operates from a primary office in Plymouth, New Hampshire, with a field office in Northampton, Massachusetts. We are registered to do business in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New Jersey, New York, and Pennsylvania. However, our market focus and expertise are New England-based. We are intimately familiar with New England’s local government forms, culture, and issues, and pride ourselves on our ability to place our recommendations for change in a context appropriate to New England and local government.

Our philosophy is to help our clients solve problems and provide realistic solutions for future success. We do not put forth idealistic, unachievable, or narrowly focused solutions. We offer a unique lens of experience that provides a foundation to develop recommendations that will work in New England communities.

Our objectives are always:

- To help agencies obtain maximum value for their limited tax dollars.
- To identify and help communities manage the risks associated with public safety functions.
- To raise public awareness of the value and professionalism of their public resources.
- To help local leaders develop and execute plans that best meet their community’s unique needs, given the resources available.

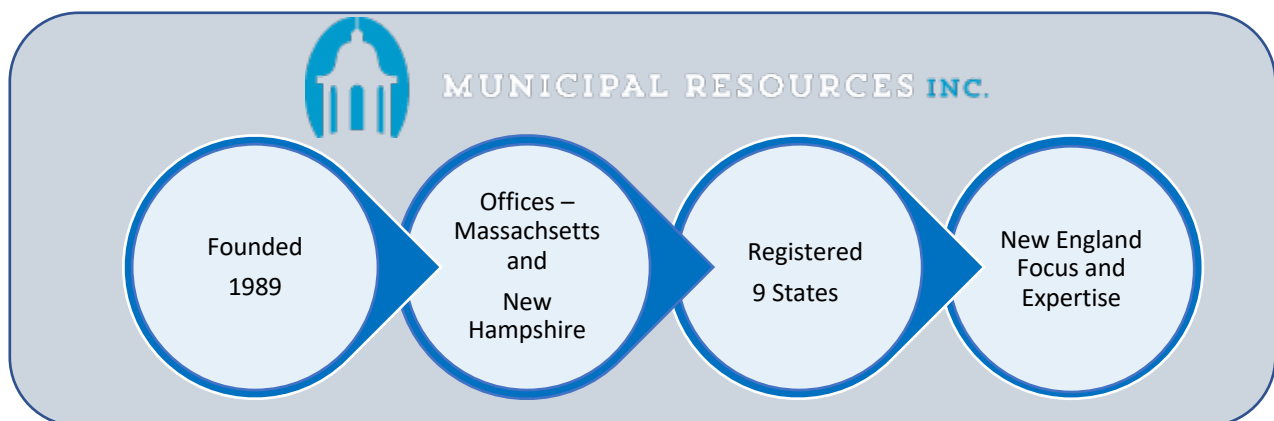


Figure 1 – MRI Overview

II. PROJECT SCOPE

This project requires an assessment of the potential of an expanded regional collaboration and evaluation of the service level provided to the Town of Madbury. A thorough review of existing staffing, funding, and regulatory environment will indicate whether the Department is able to provide a level of service that is adequate to serve the needs of the Town of Madbury. In addition, this evaluation will determine if the level of service is in line with generally accepted standards and benchmarks for a community of like character or if a single community regional collaboration/consolidation is required to continue to provide a level of service acceptable to the community. **The community selected as the focus of the primary phase of this consolidation study will be the Town of Durham. However other communities determined by the Madbury Board of Selectmen and communicated by Chief Perley via E-mail to our team may be added into this project as outlined under optional services.**

We will take the following information and topics under consideration (and include these topics in the final narrative) when conducting the review:

1. Review the current condition of the Madbury Fire Department.
2. Evaluate capital (vehicles/buildings/equipment) needs of the Madbury Fire Department should it stay independent.
3. Evaluate the current organizational structure of the Department.
4. The analysis of historical fire and EMS response data for the past five years.
5. Identify the frequency of responding to mutual aid calls and requesting mutual aid assistance.
6. Mapping of fire and EMS response times (supported by community GIS personnel).
7. Mapping of proposed consolidation estimated response times (supported by community GIS personnel).

PROJECT METHODOLOGY

To fulfill the requirements of this study, the lead consultant began with an initial orientation meeting with the Chief of the Madbury Fire Department and analyzed statistical information and data provided by the Department.

The consultants made numerous visits to Madbury and surrounding communities and completed a wide variety of tasks in the development of this report including conducting numerous personal interviews.

Time was spent gaining an understanding of the organizational, operational, and management systems and approaches currently in place, and then comparing and contrasting the current system against contemporary practice and convention.

Significant time was spent investigating, reviewing, and analyzing alternative response models for the town of Madbury to ensure community leadership had effective alternatives to compare against the department's current emergency response system.

Altogether there were twenty- two major work elements involved in conducting this analysis.

1. Reviewed community demographics, including population and business trends to determine the stability of the community's risk profile.
2. Reviewed and analyzed the current department staffing, local volunteer staffing trends, and national volunteer staffing trends and difficulties. Including the review of the State of NH and national publications.
3. A review of compiled data regarding key operational aspects of the fire and rescue services.
4. A thorough tour of the Madbury Fire Station to gain a sense of the physical environment, the potential for expansion, and full-time use.
5. A review and evaluation of all department apparatus, equipment, and assets.
6. In-person interviews with the Fire Chiefs of potential partners, including Durham, Dover, and Barrington Fire Department.
7. In-person interviews with the Town Administrators or Town Managers of potential partners, including Durham, Dover, and Barrington Fire Department.
8. Virtual interview with the Executive Director of McGregor Ambulance, the community's EMS transport provider.
9. Analyzed an inventory of fire and rescue services apparatus and equipment.
10. Analysis of the fire and rescue service's current deployment strategy, responses, and dispatch protocols.
11. Review and evaluation of mutual aid capabilities.
12. Analysis of the existing fire and rescue service's organizational structure.

13. Review and evaluation of existing fire and rescue services policies, procedures, and practices.
14. Analyze compliance with applicable regulations, standards, and industry best practices.
15. Review and evaluation of fire prevention and code enforcement operations and strategies.
16. Review and analysis of the fire department's incident/response time statistics.
17. Review of numerous documents, including the municipal budget, and fire and rescue services budget.
18. Reviewed and analyzed the department emergency response times as compared to national standards, best practices, and potential alternatives.
19. Evaluated opportunities for additional regional or shared services related to emergency response.
20. Reviewed and analyzed data and current operations of potential partners, including but not limited to staffing level organizational makeup, response capabilities, station locations, and model response times.
21. Developed estimated budgets for proposed response alternatives.
22. Worked collaboratively with CAI Technologies to develop GIS mapping that is reflective of recommended changes in deployment outlined in this report.

Our team study team investigated areas such as the organizational and command structures of the fire and rescue services and its component organizations, both individually and collectively, chain of command, span of control, budgeting, staffing, volunteer recruitment and retention, service demands, fire prevention services, response districts, dispatch protocols and the deployment of personnel, working relationships with other persons and agencies, responsiveness, internal policies and procedures, adequacy and reasonableness of facilities and equipment, and compliance with various state and federal regulations.

Following the on-site visits, the data and documentation collected, and observations made, were subjected to analysis by the project team, both individually and collectively. The information was then compared with contemporary fire service and public safety standards, recommendations, and best practices, to formulate the recommendations contained in this report and utilized for the development of this report.

This document is the work product of several months of observation, information gathering, research, and analysis. The observations made within this report are believed to be accurate based on the information gathered from Madbury Fire and the individual entities that comprise the fire and rescue services, and the combined judgment of the entire MRI fire study team.

The resulting recommendations are based upon an acknowledgment that fire and rescue services are living and constantly evolving organizations. They must constantly change and adapt to current, and anticipated, conditions and realities. A municipal fire and rescue service, while steadfastly holding onto traditions, is an organization that must be progressive and proactive, and requires a perpetual commitment to improvement. The modern fire and emergency service is constantly besieged with ever-increasing demands from the public and must readily adapt to changes in technology, constantly evolving risks and hazards, and new generations of men and women entering this highly rewarding and challenging public service avocation. The delivery of high-quality fire services requires energetic, enlightened, progressive, and proactive leadership at all levels of the fire and rescue services delivery system. Every day must include an effort to improve and move forward.

RECOMMENDATION FOCUS AREAS

The community selected as the focus of the primary phase of this consolidation study will be the Town of Durham. However other communities determined by the Madbury Board of Selectmen and communicated by Chief Perley via E-mail to our team may be added into this project as outlined under optional services.

The following definitions will apply to the scope of this project:

Collaboration – *The act or process of working together, a product resulting from working together or cooperating.*

Consolidation – *An act or instance of combining into a single unified whole, strengthening resulting from the unification of two or more elements.*

The single community consolidation feasibility study will address the following identified areas:

1. Fire Rescue Administration/Operations Consolidation
 - a. The recommended organizational structure of a merged/consolidated Department.
2. Communication Consolidation
 - a. Outline any new equipment and technologies necessary for consolidation.
 - b. Recommend a direction to provide continued support/maintenance of shared communication equipment.
3. Assets/Fleet/Equipment
 - a. Outline the transition of equipment and apparatus.
 - b. Outline any equipment and apparatus that can be removed from service.
 - c. Outline any equipment and apparatus that can be repurposed.
 - d. Outline any new equipment and apparatus necessary for consolidation.
 - e. Recommend process for maintenance of newly consolidated apparatus, equipment, and assigned/installed technologies.
4. Personnel
 - a. Identify personnel to support consolidation.
 - b. Employee analysis of a consolidation.
 - c. Review the cost of positions based on the desired level of service.
 - d. Recommend reporting structure of all members of the Madbury Fire Department.
5. Facilities
 - a. Specific recommendations for occupancy and staffing of existing facilities.
6. Emergency Medical Services
 - a. Analyze the current EMS contract and assess any changes needed to align with a consolidation.
7. Reporting and Recordkeeping
 - a. Identify the transition of report records needed.
8. Contracts
 - a. Identify if there are any existing contracts/ agreements that would need to be updated to align a consolidation.
9. Deployment

- a. Recommendations regarding deployment locations of apparatus.
- b. Recommendations regarding the deployment distribution of personnel.

10. Cost

- a. Develop a cost comparison for the Town to hire adequate personnel and provide full-time services vs consolidation, i.e. emergency personnel, Administration, HR Support, etc.
- b. Identify an approximate short and long-term cost increase or savings associated with the consolidation.
- c. Identify savings to either individual entity through enhancements resulting from consolidation.
- d. Development of a proposed consolidated operating budget.
- e. Identify approximate transition costs.

11. Implementation Schedule

- a. Identify an estimated timeline for the consolidation.

12. Conduct a high-level evaluation of the cost and feasibility of developing stand-alone 24/7 coverage in Madbury. This will consist of providing a two-paragraph narrative within the management letter and a summary projection of rough budget numbers.

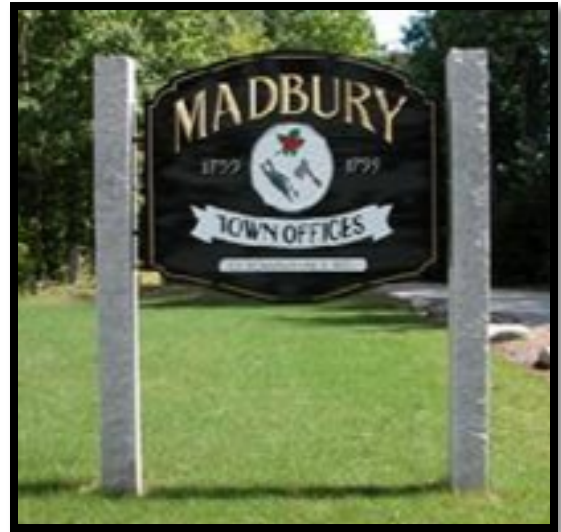
Most importantly, the study shall be an objective, unbiased assessment that is driven by data, national industry standards (e.g. NFPA, ISO, NIST, etc.), and best practices of the organization as it is currently, coupled with a future vision. In addition to this scope two contract addendums were added as the project developed, which include the following:

- 1. Addition of GIS Mapping to evaluate response capability.
- 2. Addition of additional communities to provide perspective on the options that currently exist for the Town of Madbury.

III. COMMUNITY OVERVIEW

The Town of Madbury is a southeastern New Hampshire community that was incorporated in 1755. The Town has a population approaching 2,000 residents. The population density is 169.2 people per square mile.

The Town has a unique wedge shape and is bordered by the City of Dover (northeast), the Towns of Durham (south), Lee, (south), and Barrington west). It is one of 13 communities that make up Strafford County. Geographically Madbury consists of a total of 12.2 square miles as follows:



- Land - 11.6 miles
- Water - .58 Square miles

State Routes 9, 108, and 155 are the major roadways that travel through the Town. Route 4 is the nearest interstate located approximately 4 miles away in the City of Dover.

Selectmen

Janet Wall – Chair	March 2024
Mark Avery	March 2025
Tim Burt	March 2026

Town Administrator

Eric Fiegenbaum

Fire Chief /Emergency Management Director

Thomas K. Perley

Figure 2 – Listing of Madbury Officials



Madbury is largely a residential community with a stable population of 1,954 residents, as reported in the 2022 census. This town was ranked 143rd among New Hampshire cities and towns.

Under the age of 18	30%
Age 18-24	6.40%
Age 25 - 44	32.30%
Age 45 - 64	23.70%
Age 65 and older	7.60%

Figure 4 – Madbury Resident Age Distribution

The median age was 36 years. For every 100 females there are 99.6 males.

Figure 3 – Geo Location of Madbury New Hampshire

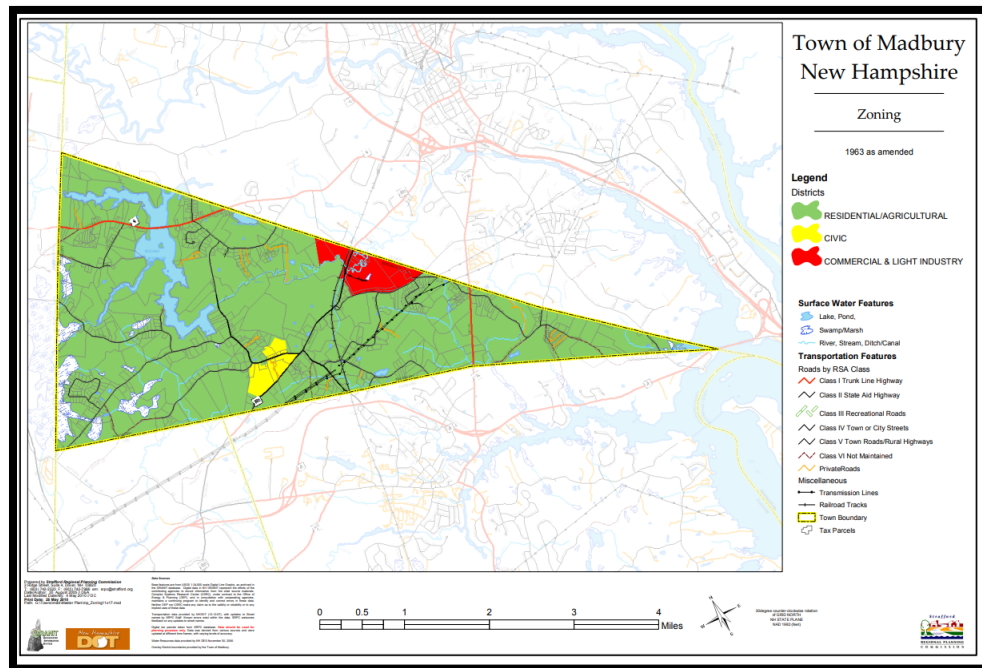


Figure 5 – Madbury Zoning Map

The community is home to an elementary school that has an enrollment of 382 students. The school is also the largest employer in the community. The school is part of the Oyster River Cooperative School District (SAU-5), along with Durham and Lee.

Largest Employers		
Organization	Industry	Employees
Moharimet Elementary School	Education	77
Landcare Inc.	Landscaping	31
Carriage Hill Assisted Living	Assisted Living Facility	30
Taylor Egg Products	Egg Products	17
UNH Kingman Farm	Research	9

Figure 6 – Madbury Largest Employers



IV. Madbury Volunteer Fire Department



The Madbury Fire Department (MFD) has been in existence for more than 75 years and is considered to be an all-volunteer fire department. The department provides fire suppression, rescue, and first response medical for some medical emergencies. The Department operates from a single station.



The MFD is led by Fire Chief and Emergency Management Director Thomas K. Perley who has served the community since 1986, where he held the rank of firefighter, Captain, and Assistant Chief before being promoted to Chief and serving 25 years. Chief Perley is well respected throughout New Hampshire.

Facilities

Madbury Fire Department is housed in an 11,000-square-foot public safety building which it shares with the Madbury Police Department. The Police Department and the Fire Department Offices are separated by a training/community room, with the apparatus bays at the end of the building. The fire department occupies approximately 60% of the building, which includes the four apparatus bays. The building does not currently have any dormitory or overnight living areas.



Figure 7– Madbury Public Safety Complex

334 Knox Marsh Road

Staffing

The Madbury Fire Department currently consists of approximately 16 volunteers with 9 of these responders considered active members. Although Madbury Fire has a strong reputation and enjoyed tremendous support from the community, the Department has struggled to recruit and retain active members, which is consistent with most volunteer fire departments across America. Some of the factors leading to this staffing challenge are listed below:

- The challenges of the current labor market
- A reduction in leisure time
- Reduce support from local employers
- Generational differences
- Increasing career opportunities within the area
- Increased competition for trained personnel
- The demographics present in Madbury

The Madbury Fire Department currently has the following staffing profile:

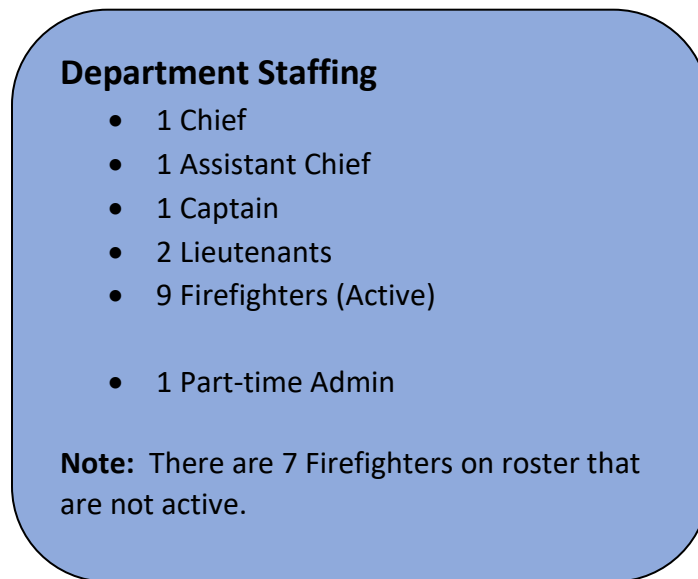


Figure 8– Madbury Fire Department

Staffing Profile

NOTE: Based on current staffing difficulties, very few emergency responses meet the National Standards, or current best practices.

Apparatus

The Department apparatus is well-maintained and in good condition. The following images and descriptions represent the current inventory:



Figure 9– Madbury Engine One

Engine One

- 2003 KME Pumper
- 6 Person Cab
- 1500 Gallon Per Minute Pump
- 1250 Gallon Water Tank
- 1500 Ft Large Diameter Supply Hose
- Ground Ladders
- Multi-Gas Detector
- Ice Rescue Equipment



Figure 10 – Madbury Engine Three

Engine Three

- 2018 Spartan/Marion
- 1500GPM Pump
- 1200g tank
- 50g Class A foam cell



Figure 11 – Madbury Tanker One

Tanker One

2005 International/KME
Tanker/Pumper
3 Person Cab
1000 Gallon Per Minute Pump
2000 Gallon Water Tank
2500 Gallon Portable Water Tank
500' Large Diameter Supply Hose
3 Large Diameter Water Dump Chutes
(1 each side, 1 rear)



Figure 12 – Madbury Forestry One

Forestry One

Kimtek Skid Unit
250g Tank
5g Class A Foam cell
250gpm pump



Figure 13 – Madbury ATV Rescue Unit

ATV & Rescue Unit

2021 John Deere Gator
Unit Kimtek Skid Unit
100gpm Pump
50g Water
Stokes basket



Figure 14 – Madbury Utility One

Utility One

2022 Ford F-350 Super-Duty
4 Person Cab
1300lb Liftgate
Portable Pumps
Forestry Firefighting Gear
Medical Supplies



Figure 15 – Madbury Car One

Car 1

2020 Tahoe

The Department’s vehicle maintenance is performed by the same mechanic that maintains the Town of Durham Fire fleet. This is a contractor who is a Captain at the Durham Fire Department who provides service and repair on an as-needed basis.

Call Volume

The fire department’s call volume is low and appears to be fairly consistent over the past number of years. Fire department call volume refers to the number of calls or incidents that a fire department responds to over a specific period of time.

NFIRS Categories	2023		2022	
100 Fires	4	2.70%	6	2.86%
200 Rupture Explosion	0	0.00%	0	0.00%
300 Rescue and EMS	90	60.81%	129	61.43%
400 Hazard Condition	8	5.40%	15	7.14%
500 Service Call	21	14.19%	32	15.24%
600 Good Intent	22	14.86%	11	5.23%
700 False alarm or call	1	0.67%	14	6.66%
800 Severe Weather	0	0.00%	1	0.48%
900 Special Incident	2	1.35%	2	0.95%
TOTAL	148		210	

Figure 16- Fire Department Call Analysis by Incident Type

Although the Town contracts with McGregor Ambulance for patient treatment and transport, the Madbury Fire Department responds to EMS calls when they have trained EMS personnel available. This is solely dependent on skilled personnel being available to respond to the call rather than any type of call risk assessment. The Department responded to 104 EMS calls in 2022 and 78 in 2023. This represents approximately 50% of all the EMS calls within the Town of Madbury.

Usually, time-of-day data indicates a peak time of service, however, with the low call volume experienced within the Town of Madbury there is no peak time of incidents.

Emergency Dispatch

The State of New Hampshire uses a statewide centralized system to answer all 911 calls. This means all 911 calls are answered at a state location called a Public Safety Answering Point (PSAP). Once the call is answered it is forwarded to the local dispatch center to have emergency crews dispatched. The town of Madbury utilizes UNH Fire Alarm to provide emergency dispatching services for the Fire Department.



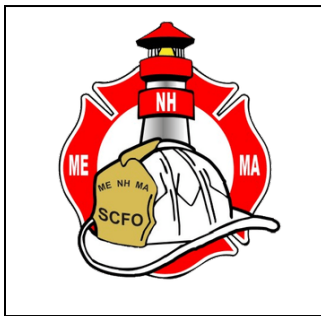
Mutual Aid Overview

The Madbury Fire Department gives and receives mutual aid from surrounding towns on an as-needed basis. This is accomplished through a mutual aid agreement with the local mutual aid district.

Mutual Aid	2023	2022
Received (Total)	11	23
Given (Total)	7	12
Fires	2	3

Figure 17 – Mutual Aid Response Profile

Seacoast Chief Fire Officers Mutual Aid District



(55) member agencies.

The Madbury Fire Department is a member of the Seacoast Chief Fire Officers Mutual Aid District (SCFOMAD), which is a municipal corporation registered with the State of New Hampshire, comprised of fire and rescue departments of fifty-one (51) cities and towns across the Seacoast region of New Hampshire, Maine, and Massachusetts. The membership includes full-time, on-call, combination, and volunteer fire departments as well as four (4) associate member agencies for a total of fifty-five

[Seacoast-Chiefs-2023-2026-Strategic-Plan-Final-website.pdf](#)
seacoastchiefs.com

The District provides mutual aid agreements with all its members to ensure effective and efficient mutual aid to any member requesting it in times of major emergencies. The District maintains and supports numerous valuable assets such as three SCBA support trailers capable of filling air cylinders, as well as a mobile command post that is often utilized by fire, EMS, and law enforcement agencies at large-scale events. The District also maintains a regional hazardous materials response team and a type two incident management team. The District is governed by its bylaws which are administered by a member-elected Board of Directors.

Mission Statement

The Seacoast Chief Fire Officers Mutual Aid District is dedicated to enhancing fire and life safety across a seacoast that spans three states, through strong partnerships, constant collaboration, and open honest communications.

Figure 18 – Seacoast Fire Chiefs Mission Statement



Figure 19 – Seacoast Chiefs Strategic Plan and Website address

V. COMMUNITY RISK ASSESSMENT

Fire, rescue, and EMS services generally have a common overall mission; the protection of life and property, but different community profiles in which they operate. These dissimilarities create very different fire and rescue services operational needs based on a unique community risk profile, service demands, and stakeholder expectations.

A community risk assessment is a process to identify the hazards, risks, fire, and life safety problems, and the demographic characteristics of those at risk in a community. In each community, there are numerous hazards and risks to consider. For each hazard, there are many possible scenarios and potential incidents that could be encountered depending on the timing, magnitude, and location of the hazard or incident. A risk analysis provides insight into the most challenging fire and life safety problems, and the people who are affected. The analysis results create the foundation for developing an overall community strategy and plan to keep the community safe.

Conducting a community risk analysis is the first step toward deciding which fire or injury problem needs to be addressed. Risk analysis is a planned process that must be ongoing, as communities and people are constantly changing. Too often, an objective and systematic community risk analysis is a step that is overlooked in the community education process. Many emergency service organizations address risks based on a perceived need for service that isn't there. This approach can be costly (i.e., misdirected resources, continued property loss, injuries, or deaths). In short, a good community risk assessment will produce a picture of what the hazards and potentials for incidents are, identify who is at risk, and attempt to quantify the expected impacts.

Understanding the definition of hazards and risks is critical to the risk assessment process. Hazards are physical sources of danger that can create emergency events. Hazards can be items such as buildings, roadways, weather events, fires, etc. Risk relates to the probability of a loss due to exposure to a hazard. People and property can be at risk. Consequences for the



Figure 20 – National Volunteer Fire Council Overview of Fire in the United States

community are also factors to consider. Each of these factors is assessed during the community risk process (Figure 21).

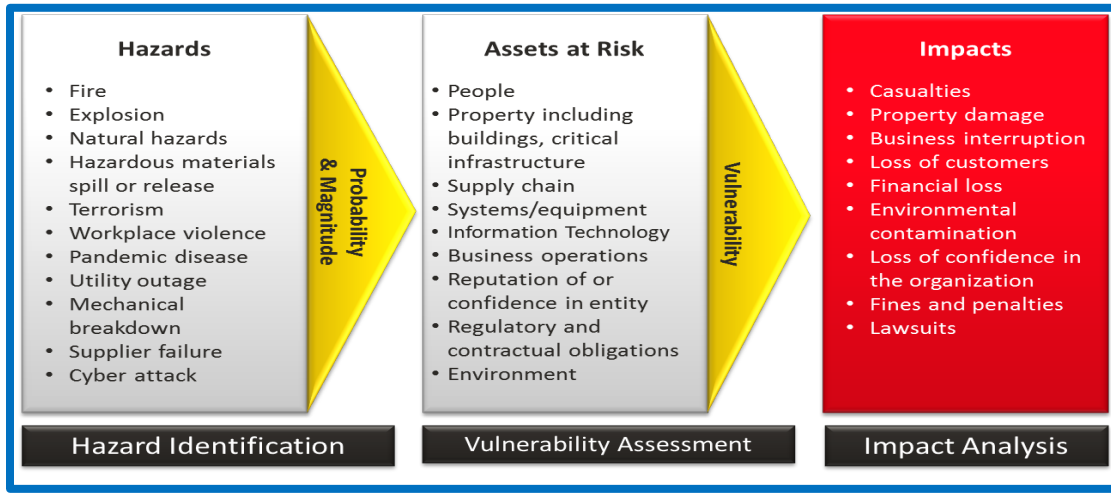


Figure 21
Risk Assessment Process
 Image Credit: www.ready.gov/risk-assessment

A more focused fire risk assessment is performed by assessing such factors as the needed fire flow, probability of an incident, consequences of an incident, and occupancy risk. The “score” established is then utilized to categorize the area, or even individual properties, as one of low, moderate, or high/maximum risk. This categorization can assist the fire department in establishing fire risk/demand areas or zones.

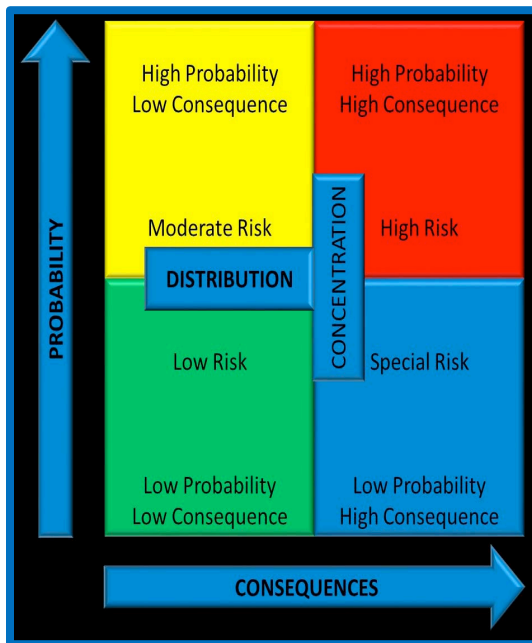


Figure 22
Fire Probability and Consequences Matrix
 Credit: Commission on Fire Accreditation

Having this information readily available provides the community and the fire department with a better understanding of how fire stations, response run cards, and staffing patterns can be used to provide a higher concentration of resources for higher-risk scenarios or, conversely, fewer resources for lower levels of risk.¹

The community fire risk assessment may also include determining and defining the differences in fire risk between a detached single-family dwelling, a multi-family dwelling, an industrial building, and a high-rise building by placing each in a separate category.

According to the NFPA *Fire Protection Handbook*, these hazards are defined below:

- **High-hazard occupancies:** Schools, hospitals, nursing homes, high-rise buildings, and other high life-hazard or large fire-potential occupancies.
- **Medium-hazard occupancies:** Apartments, offices, mercantile, and industrial occupancies not normally requiring extensive rescue by firefighting forces.
- **Low-hazard occupancies:** One-, two-, or three-family dwellings and scattered small business and industrial occupancies.

The NFPA also identifies a key element of assessing community vulnerability as fire department operational performance which is comprised of three elements: resource availability/ reliability, department capability, and operational effectiveness.

- **Resource availability/reliability:** The degree to which the resources are ready and available to respond.

¹ Fire and Emergency Service Self-Assessment Manual, Eighth Edition, (Commission on Fire Accreditation International, 2009),

- **Department capability:** The ability of the resources deployed to manage an incident.
- **Operational effectiveness:** The product of availability and capability. It is the outcome achieved by the deployed resources or a measure of the ability to match resources deployed to the risk level to which they are responding.

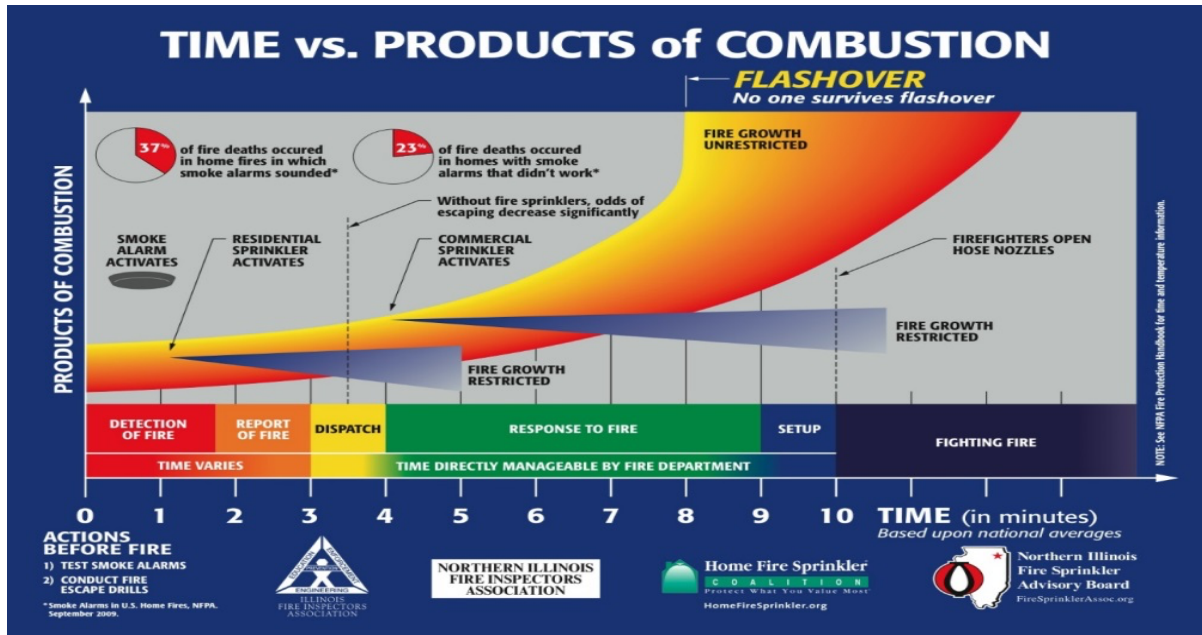


Figure 23 – Time Vs. Fire Growth Curve

The implementation of successful community risk reduction strategies after completion of a community risk assessment is linked directly to the prevention of civilian and firefighter line-of-duty deaths and injuries.

The greatest fire safety concern throughout the area is the potential life loss in fires that occur in non-sprinklered, single, and multi-family residential dwellings during sleeping hours, which is consistent with national trends. These fires are fueled by new “lightweight” construction and more flammable home contents. The time to escape a house fire has dwindled from about seventeen (17) minutes, 20 years ago, to three to five minutes today. This poses a severe risk not only to occupants but also to firefighters as they now have less time to do their job and save residents’ lives and property.

Although it is believed that there are not many sprinkled buildings in Madbury, it is known that automatic sprinklers are highly effective elements of total system designs for fire protection in buildings. They save lives and property, producing large reductions in the number of deaths per thousand fires, and average direct property damage per fire, especially in the likelihood of a fire

with a large loss of life or large property loss. They do so, much quicker, and often more effectively and with less damage than firefighting operations. No fire safety improvement strategy has as much documented life safety effectiveness as fire sprinklers because they extinguish the fire, or, at a minimum hold it in check and prevent flashover, until the arrival of the Fire Department.

Studies from 2007 to 2011 of fires in all types of structures show when sprinklers were present in the fire area of a fire that was large enough to activate the sprinklers in a building not under construction, sprinklers operated 91% of the time². When they operated, they were effective 96% of the time, resulting in a combined performance of operating effectively in 87% of reported fires where sprinklers were present in the fire area and the fire was large enough to activate sprinklers³.

In homes (including apartments), wet-pipe sprinklers operated effectively 92% of the time. When wet-pipe sprinklers were present in the fire area in homes that were not under construction, the fire death rate of 1,000 reported structure fires was lower by 83%, and the rate of property damage per reported home structure fire was lower by 68%.

Like most communities, Madbury has various types of housing that are older, although still well maintained. Most of these older residential occupancies are wood frame houses. The fire service further assesses the relative risk of properties based on several factors. Properties with high fire and life risks often require greater numbers of personnel and apparatus to effectively mitigate a fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk within each area of a community.

- **Low Risk:** Minor incidents involving small fires (fire flow less than 250 gallons per minute), single patient non-life-threatening medical incidents, minor rescues, small fuel spills, and small brush or outside fires.
- **Moderate Risk:** Moderate risk incidents involving fires in single-family dwellings and equivalently sized commercial office properties (needed fire flow generally between 250 gallons per minute to 1,000 gallons per minute), life-threatening medical emergencies, hazardous materials emergencies requiring specialized skills and equipment, technical rescues involving specialized skills and equipment, and larger brush and outside fires particularly if structures are exposed.
- **High Risk:** High-risk incidents involving fires in commercial properties with a sustained attack (fire flows more than 1,000 gallons per minute), multiple patient

² U. S. Experience with Sprinklers. John R. Hall, Jr. National Fire Protection Association, June 2013.

³ U. S. Experience with Sprinklers. John R. Hall, Jr. National Fire Protection Association, June 2013.

medical incidents, major releases of hazardous materials, and high-risk technical rescues.

The potential emergency risks present in the Town are not limited to just residential or commercial structural fire incidents. Weather, transportation, hazardous materials, and man-made disasters all add to the overall risk in the community.

The project team assesses that the level of risk differs based on the specific infrastructure and demographics of each community. The level of risk faced by each community and the region overall can be established based on the information presented in Figure 24.

OCCUPANCY DESCRIPTION	RISK
<i>Single Family Residential (unsprinkled)</i>	<i>Moderate</i>
<i>Multi-Family Residential (sprinkled)</i>	<i>Moderate</i>
<i>Multi-Family Residential (unsprinkled)</i>	<i>High</i>
<i>Institutional-Educational</i>	<i>Low</i>
<i>Commercial (Retail and Office) (sprinkled)</i>	<i>Moderate</i>
<i>Commercial (Retail and Office) (unsprinkled)</i>	<i>Low</i>
<i>Industrial</i>	<i>Moderate/High</i>
<i>Open Space</i>	<i>Low</i>
<i>Transportation Incident</i>	<i>High</i>

Figure 24 - Community Risk Assessment Hazard Index

The weather a community experiences can impact the Fire and EMS ability to respond. Snow, ice, and other conditions can slow response. Major storms can create emergencies that can overwhelm local emergency response forces. The regional area enjoys a moderate climate typical of the New England region. Thunderstorms, strong windstorms, and significant rain events happen several times in an average year. Tropical storms and hurricanes also occasionally impact the area. Snowfall is experienced annually, and occasionally in amounts that paralyzes the region.

The above information is intended to provide a “snapshot” of the area. It is not intended to be all-inclusive or comprehensive. For the fire department and first responders it serves to put the town, and its associated hazards and risks, into some context as the fire department works to carry out the recommendations of this study. A moderate to high-risk designation should not infer that the risks are imminent safety concerns. The risk designations present themselves based on several factors including what is the potential risk to people, based on the factors specific to the target hazard in question.

Ultimately, a comprehensive risk assessment should:



- Clearly identify and classify the town's current risks;
- Place the risks in context with the Fire Department's current operational capabilities and procedures;
- Reflect on what the Budget Committee and Board of Selectmen feel is an acceptable level of risk for the town.

Looking ahead, the area will continue to experience a slow to moderate growth increase in growth and development, although probably not at high levels. While this development will have a definitive impact on the town's emergency services, the exact amount is difficult to quantitatively and accurately predict. Increased commercial development of any type will mean an increase in the number of people living, working, and traveling within the area. Each of these will reasonably be expected to result in an increased number of requests for services from the fire services in the region. They can also impact response times through increased traffic and congestion.

It is likely that the most significant increase in requests for emergency services will be EMS-related. More people simply increase the number of medical emergencies that occur. It would not be unreasonable to expect that the increase in EMS incidents would be proportional to the increase in population; however, that is not always the case. Although a number of factors can ultimately impact the requests for service, such as the ages or socio-economic status of new residents, or an aging population, it could reasonably be anticipated that an increase in population, along with potential increases in employment from any significant commercial development, would translate into an increase in emergency medical incidents.

The current community demographics are relatively stable and should not change tremendously over the next 5 – years.

The fire service further assesses the relative risk of properties based on several factors. Properties with high fire and life risks often require greater numbers of personnel and apparatus to effectively mitigate a fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk within each area of the community. The assessment of each factor and hazard as listed below took into consideration the likelihood of the event, the impact on the Community itself, and the impact on the Community's fire department response and EMS provider's ability to deliver emergency services, which includes automatic aid capabilities. The list is not all-inclusive but includes categories most common or that may be present in the Community as a whole.

Low Risk:

- *Automatic Fire/False Alarms*
- *Single patient/non-life threatening BLS EMS Incidents*
- *Minor Flooding with thunderstorms*
- *Good Intent/Hazard/Public Service*
- *Minor fire incidents (fire flow less than 250 gallons per minute) with no life safety exposure*
- *Minor rescues*
- *Outside fires such as grass, rubbish, dumpster, and vehicles with no structural/life safety exposure*
- *Small fuel spills*

Moderate Risk:

- *Fires in single-family dwellings and equivalently sized commercial office properties (needed fire flow generally between 250 gallons per minute to 1,000 gallons per minute) where fire and/or smoke is visible indicating a working fire.*
- *Life threatening ALS medical emergencies*
- *Motor Vehicle Accident (MVA)*
- *MVA with entrapment of passengers*
- *Hazardous materials emergencies requiring specialized skills and equipment but not involving a life hazard*
- *Technical rescues involving specialized skills and equipment (such as low angle rescue involving ropes and rope rescue equipment and resources*
- *Larger brush and outside fires, particularly if structures are exposed*
- *Suspicious Substance Investigation involving multiple fire companies and law enforcement agencies*
- *Surface Water Rescue*
- *Good Intent/Hazard/Public Service fire incidents with life safety exposure*

High Risk:

- *Fires in larger commercial properties and target hazards with a sustained attack (fire flows more than 1,000 gallons per minute)*
- *Cardiac/respiratory arrest*
- *Multiple patient medical/mass casualty incidents with more than 10 but less than 25 patients*
- *Major releases of hazardous materials that cause exposure to persons or threaten life safety*
 - *Confined Space Rescue*
 - *Structural Collapse involving life safety exposure*
 - *High Angle Rescue involving ropes and rope rescue equipment*

- *Trench Rescue*
- *Explosion in a building that causes exposure to persons or Threatens life safety or outside of a building*
- *Suspicious Substance incident with injuries*
- *Weather event that creates widespread flooding, building damage, and/or life safety exposure*

Special Risk:

- *Working Fire in a structure greater than three (3) floors*
- *Fire at an industrial building or complex with hazardous materials*
- *Mass Casualty Incident over 25 patients*
- *Rail or transportation incident that causes life safety exposure or threatens life safety through the release of hazardous smoke or material*

VI. INSURANCE SERVICES OFFICE (ISO) RATING

ISO is an independent risk company that services insurance companies, communities, fire departments, insurance regulators, and others by providing information about their risks. ISO's expert staff collects information about municipal fire suppression efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data and assigns a Public Protection Classification – a number from 1 to 10. This Class rating places the community in the middle of having a commendable fire suppression program for its size. A Class 1 community represents an exemplary fire suppression program, and Class 10 indicates that the area's fire suppression program does not meet ISO's minimum criteria.

The Public Protection Classification (PPC) program provides objective countrywide criteria that may prove helpful in connection with fire departments and the community's planning and budgeting for facilities, equipment, and training. When companies have fewer or lower claims to pay, the premiums they collect can be lower. Therefore, by recognizing the potential effect of improved fire suppression on fire insurance losses, in that respect, the PPC program can often serve as an objective mechanism that can help recognize communities that choose to maintain and improve their firefighting services.

PPC can also be an important factor in overall community resilience and provides a consistent measurement tool that can help in these efforts, from the structural fire response perspective. Given the potential effect on fire insurance rates, the PPC could also be a factor considered by some businesses and developers to determine where to make investments.

While ISO's primary focus is to measure the effectiveness of a community's ability to respond to structure fires for insurance purposes, there are many derivative benefits. These include providing a strong level of preparedness and a rapid response capability to all hazard events that may occur.

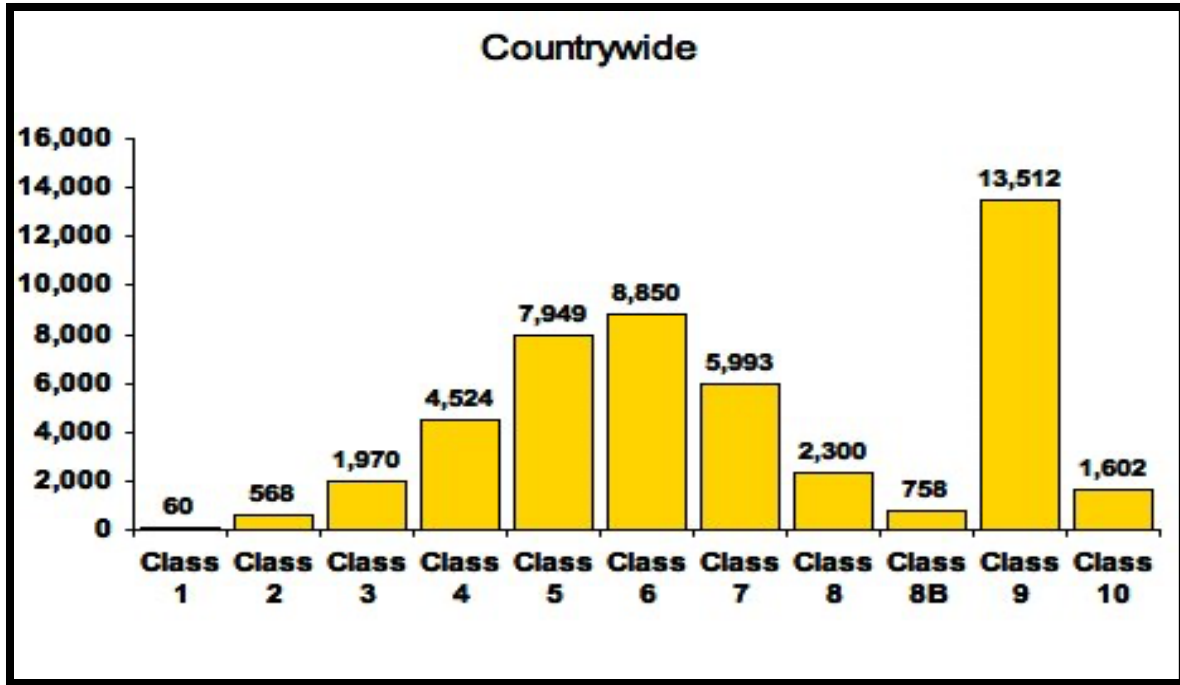


Figure 25 – ISO Grading for the United States 2019

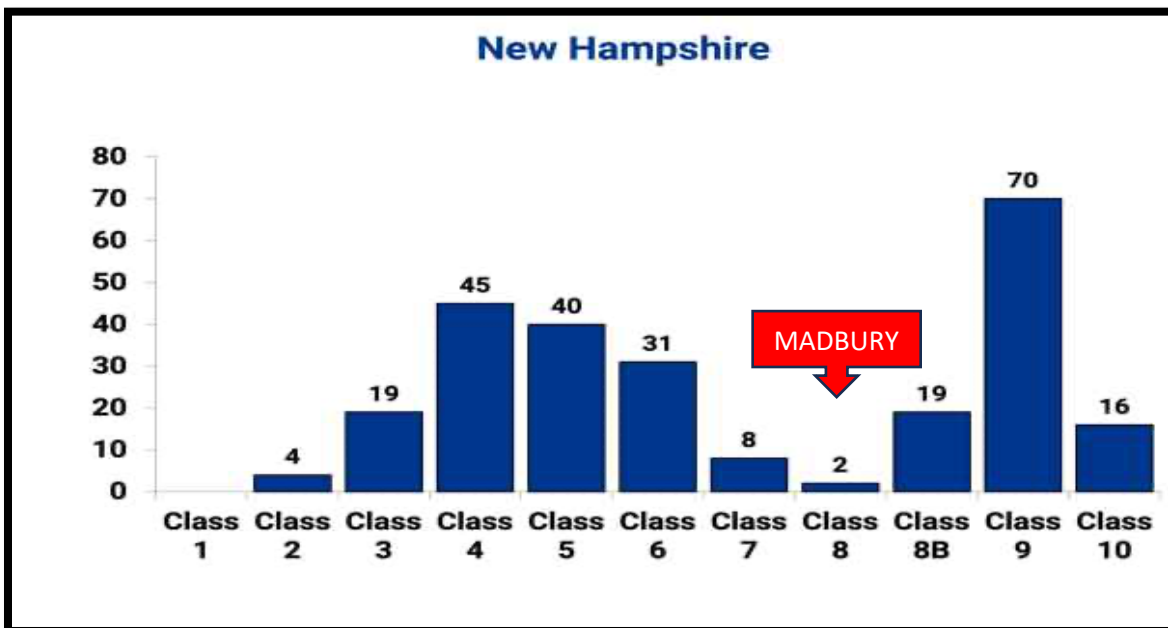


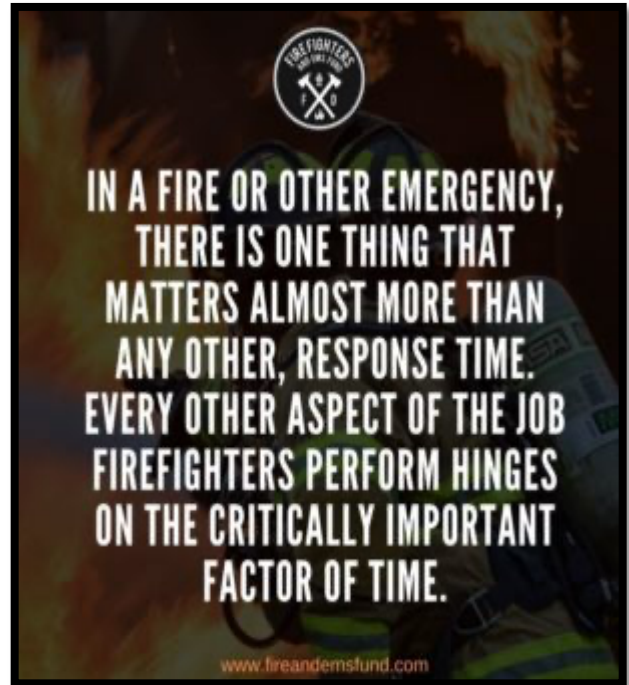
Figure 26 - ISO Grading Chart NH 2019

VII. RESPONSE TIME DATA AND EVALUATION

Response time is one of the most important factors for firefighters because their ability to save lives and rescue people depends on it. Every fire department in the world seeks strategies to decrease their response time, and several analyses have been conducted in the past years to determine what could impact response time.

A few minutes could be the difference between preserving life and property or allowing it to be completely destroyed.

Fire departments throughout the country obsess over their response times, and it is a defining statistic on the overall effectiveness of public safety. To fully evaluate response times, you have to examine all the components that contribute to the overall time from when 911 is dialed and help arrives.



Several elements make up response time. These include:

Call Answering Time:

The time interval begins when the 911 call is received by the State Public Safety Answering Point (PSAP). The PSAP gets the calls gathers basic information and transfers calls to the local dispatch center. In Madbury's case, it is the UNH dispatch center. The standard is 15 seconds.

Call Processing Time:

The time interval when the call is acknowledged and received by the UNH Dispatch Center and notifies the fire department of the emergency (tones them out). The standard is 60 seconds.

Turnout Time:

The time interval when the Fire department has acknowledged the emergency call to the time the first piece of apparatus begins to leave the station. The standard is 80 seconds.

Travel Time:

The time interval begins when the fire department is en route to the emergency and ends when the unit arrives at the emergency scene.

Achieving the quickest and safest response times possible should be a fundamental goal of every fire department and first-response EMS provider. It is not just a cliché that during critical life-threatening situations, minutes and even seconds truly do count.

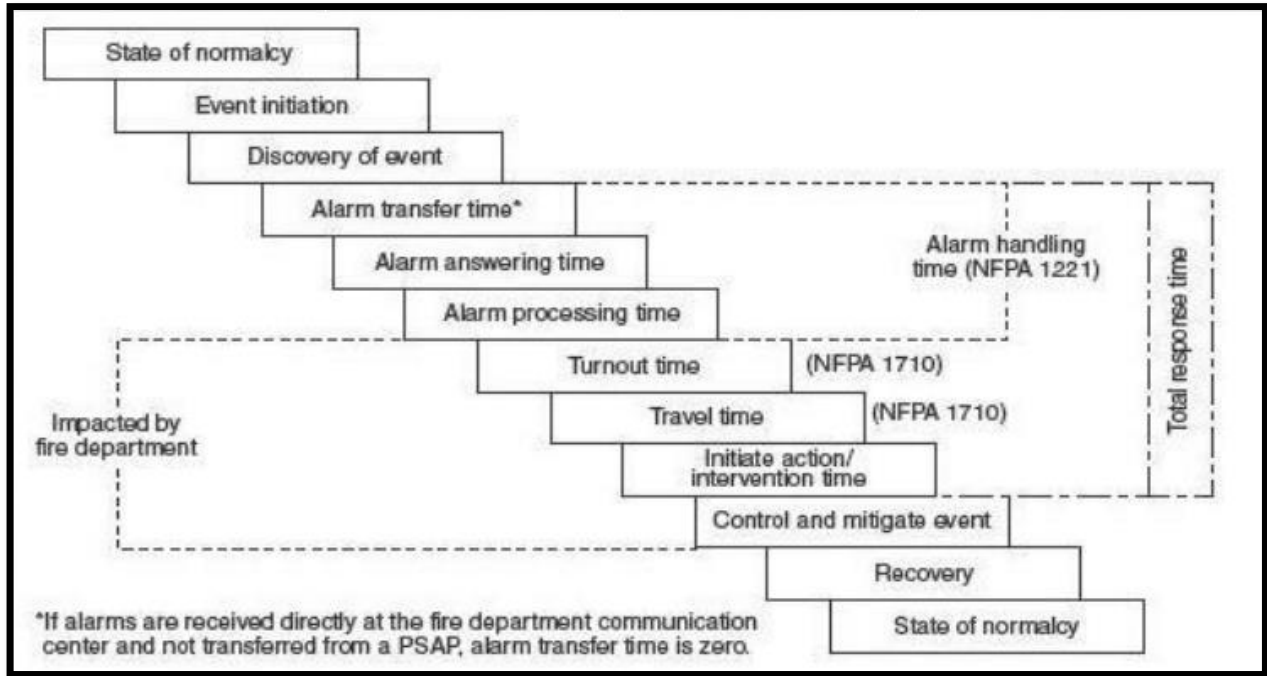


Figure 27 – NFPA 1710 Response Time Component Chart.

Annex A Figure 3.3.53.6

Intervention Time/ Initiate Action:

This is the time interval from when the Fire Department arrives on the scene to the initiation of emergency action to mitigate the incident. The intervention time is greatly affected by the leadership, training, and staffing of the initial arriving crews.

Madbury Response Data

During 2022 the department's records depict a response time averaged 12.69 or **12 minutes 41 seconds**. This is a significant response time that does not comply with National Fire Protection Association (NFPA) or Fire Department accreditation standards.

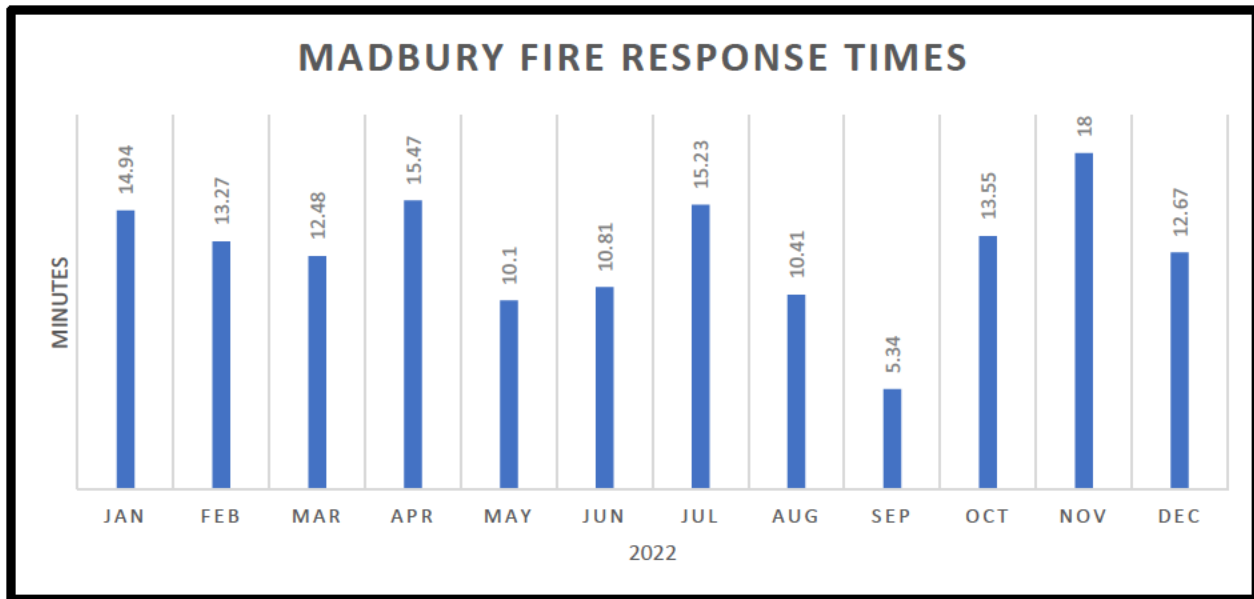


Figure 28 – Average Madbury Response Times by Month

For this review, response times and incident data for the fire department were taken from the “FirePrograms” emergency reporting software reports.

These response times do not indicate when a staffed piece of fire apparatus is on scene. It may just be one officer. Therefore, response time for a fully functioning crew would be much longer.

NOTE: Based on current staffing difficulties, very few emergency responses meet the National Standards, or current best practices.

VIII. FIRE SERVICE STAFFING

Staffing is the biggest key to the success of any fire response. For the most part, the average citizen only sees the amount of shiny red fire trucks the department has and sees that as their “fire department”. It has often been said that the fire service can have all the best equipment, but that equipment is useless without a good and efficient crew to operate it. In today’s world, call, and volunteer firefighters are getting harder and harder to not only recruit, and keep trained, but also to retain. This is a nationwide issue that in many communities is now becoming a crisis.

Having several people listed on a roster may give a false sense of security and be misleading. Their participation in training, working shifts, and actual response to incidents shows the real numbers and the level of service the department can deliver. Again, Madbury has sixteen (16) firefighters on the roster but only has nine (9) that are active.

Although compensation is always a consideration, most firefighters are not providing the service to the community for money. As an example, MRI has studied a department where 14% of emergency calls received no response from the local community. In an effort to address the situation, the Board of Selectmen doubled wages but received no associated increase in participation and response. Although this is an extreme case, other retention strategies may be more effective. It is the hope of most departments to get people interested in performing the services and to keep them as long as they can.

National Standards

NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2014 edition outlines the organization and deployment of operations by volunteer, and primarily volunteer fire departments.

Some of the key *provisions of NFPA 1720 are as follows:*

- 1. Paragraph 4.3.1 on Staffing and Deployment states that the Fire Department shall identify minimum staffing requirements to ensure that enough members are available to operate safely and effectively.*
- 2. Paragraph 4.3.2 on Staffing and Deployment states that Table 4.3.2 (Figure 19) shall be used by the authority having jurisdiction (AHJ) to determine staffing and response time objectives for structural firefighting, based on a low-hazard occupancy such as a 2,000-square-foot, two-story, single-family, without basement or exposures.*

Table 4.3.2, Staffing and Response Time				
Demand Zone	Demographics ¹	Minimum Staff to Respond	Response Time ² (minutes)	Meets Objective (% of the time)
Special risks	AHJ	AHJ	AHJ	90 %
Urban	>1000 people/mi. ²	15	9	90 %
Suburban	500 - 1000 people/mi. ²	10	10	80 %
Rural	< 500 people/mi. ²	6	14	80 %
Remote	Travel distance > 8 mi.	4	Dependent upon travel distance	90 %

1 – A jurisdiction can have more than one demand zone.

2 – Response time in this table begins upon completion of the dispatch notification and ends at the time interval shown in the table.

Figure 29 - Staffing and Response times from NFPA 1720

3. *Paragraph 4.3.3 on Staffing and Deployment states that upon assembling the necessary resources at the emergency scene, the Fire Department should have the capability to safely commence an initial attack within two minutes, 90% of the time.*
4. *Paragraph 4.6.1 Initial Firefighting Operations states that initial firefighting operations shall be organized to ensure that at least four members are assembled before interior fire suppression operations are initiated in a hazardous area.*
5. *Paragraph 4.7.1 Sustained Firefighting Operations states that the Fire Department shall have the capability for sustained operations, including fire suppression; engagement in search and rescue, forcible entry, ventilation, and preservation of property; accountability of personnel; the deployment of a dedicated rapid intervention crew (RIC); and the provision of support activities for those situations which are beyond the capabilities of the initial attack.*
6. *Paragraph 4.7.2 Sustained Firefighting Operations also states that the capability to sustain operations shall include sufficient personnel, equipment, and resources to effectively, efficiently, and safely conduct the appropriate operations.*

Note: While the NFPA standards are nationally recognized consensus standards, it is still the responsibility of the local jurisdiction to determine the acceptable level of risk and corresponding fire protection/EMS services.

Some jurisdictions add additional response resources and, in some cases, exceed the specifics of national benchmarking for personnel and other resources particularly when the incident is in a larger structure where the life hazard may be higher and/or the potential fire situation much more complex. Personnel needs for fires involving large, more complex structures, such as a response to Carriage Hill Assisted Living and rehab center and commercial occupancies will require a significantly greater commitment of initial personnel, minimally 27/28, according to the 2016 edition of NFPA 1720's companion standard NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments*. This should include reported fire incidents in buildings that are fully sprinklered. While sprinklers are highly effective, they are not 100% so. Until such time the extent and seriousness of the incident can be determined, a full complement of personnel and apparatus should be dispatched.

Figure 30 identifies, and Figure 31 illustrates, the critical tasks and resource deployment required for low to moderate-hazard incidents such as one and two-family residential and small commercial structure fires. Although some people advocate that these types of incidents can be handled with less personnel, unless it is a small fire, there is the possibility there will not be enough personnel available to perform all the critical tasks necessitating that some be delayed.

CRITICAL TASK	NEEDED PERSONNEL
Incident Command	1
Continuous Water Supply/Pump Operator	1
Fire Attack via Two Handlines	4
Hydrant Hook-Up, Forcible Entry, Utilities	2
Primary Search and Rescue	2
Ground Ladders and Ventilation	2
Aerial Operator (if Aerial is Used)	1
Establishment of an IRIT (Initial Rapid Intervention Team)	2
Effective Response Force	14/15

Figure 30 - Critical Tasking: Low And Moderate Risk Structure Fire

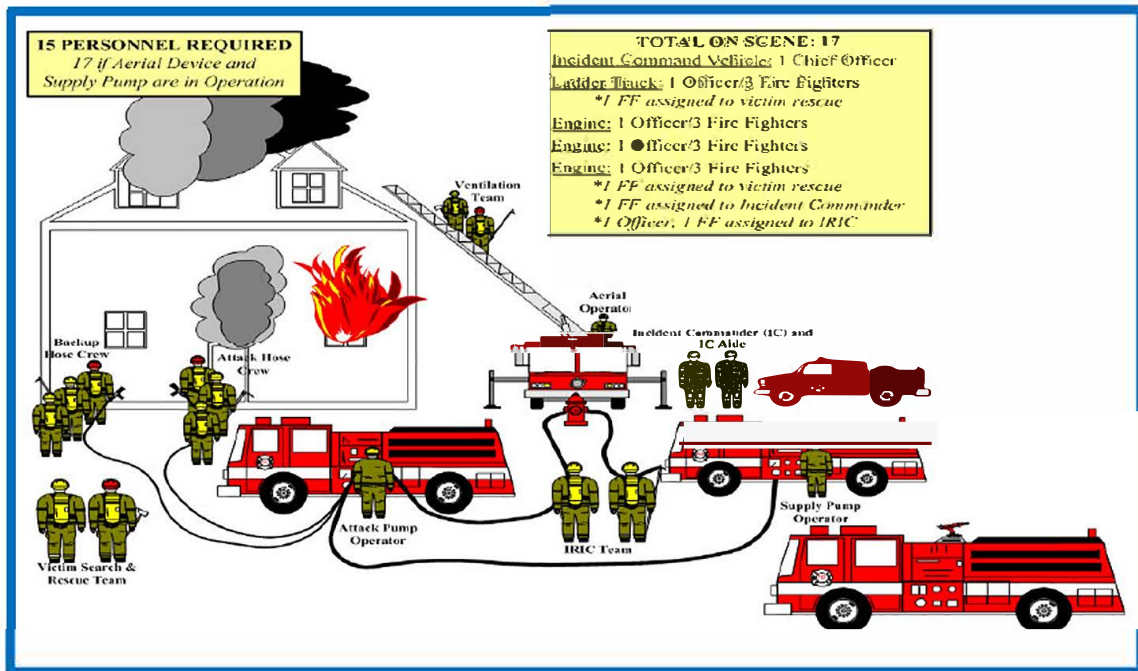


Figure 31
Typical Basic Staffing Needs For A Single-Family Dwelling Fire.
Image credit: IAFF 266

These tasks meet the minimum requirements of NFPA 1720 for the initial full-alarm assignment to a typical low-risk, 2000-square-foot, 2-story residential structure. These are the proverbial “bread and butter” structural fire incidents that fire departments respond to, and which are, by far, the most common type of structure fire. Personnel requirements for fires involving large, more complex structures such as commercial or industrial facilities or multifamily residential occupancies will require a significantly greater commitment of personnel.

Respondents to a national fire and EMS questionnaire reported that they achieved NFPA 1720 compliance for structure fire response and an average of 60.52% of the time. This ranged from a low of six percent to a reported high of 100%.

The 2016 edition of NFPA 1710 recommends a minimum of 27/28 personnel on the initial response for fires involving moderate hazard garden-style apartments and strip shopping centers (Figure 32 below).

CRITICAL TASK	NEEDED PERSONNEL
Incident Command	2
2 – Independent Water Supply Lines/Pump Operators	2
Fire Attack via Three Handlines	6
Support Firefighter for each Handline	3
2 - Search and Rescue Teams	4
2 - Ground Ladders and Ventilation Teams	4
Aerial Operator (if Aerial is Used)	1
Rapid Intervention Team (1 Officer/3 Firefighters)	4
EMS/Medical	2
Effective Response Force	27/28

Figure 32
Critical Tasking: Moderate Risk Structure Fire

Figure 33 identifies critical tasking for fires involving high risk structures such as hospitals, nursing homes, and assisted living facilities.

CRITICAL TASK	NEEDED PERSONNEL
Incident Command	2
2 – Independent Water Supply Lines/Pump Operators	2
Investigation/Initial Fire Attack Line	3
Backup Line	3
Secondary Attack Line	3
3 - Search/Rescue Teams	6
2 – Ground Ladder and Ventilation teams	4
Water Supply/Fire Department Connection	2
Aerial Operators (if Aerials are Used)	2
Safety/Accountability	2
Rapid Intervention Team (1 Officer/3 Firefighters)	4
EMS/Medical	4
Effective Response Force	35/37

Figure 33
Critical Tasking: High Risk Structure Fire

There has been much research done by several fire departments on the effects of various staffing levels. One constant that has emerged is that company efficiency and effectiveness decrease substantially, while injuries increase when company/unit staffing falls below four personnel. A recent comprehensive yet scientifically conducted, verified, and validated study titled *Multi-*

Phase Study on Firefighter Safety and the Deployment of Resources was performed by the National Institute of Standards and Technology (NIST) and Worcester Polytechnic Institute (WPI), in conjunction with the International Association of Fire Chiefs, the International Association of Fire Fighters, and the Center for Public Safety Excellence. This landmark study researched residential fires, where most of the fires, injuries, and fatalities occur.

The study concluded that the size of firefighter crews has a substantial effect on the fire department's ability to protect lives and property in residential fires and occupancies.

Several key findings of the study include:

- *Four-person firefighting crews were able to complete 22 essential firefighting and rescue tasks in a typical residential structure 30% faster than two-person crews and 25% faster than three-person crews.*
- *The four-person crews were able to deliver water to a similarly sized fire 15% faster than the two-person crews and 6% faster than three-person crews, steps that help to reduce property damage and reduce danger/risks to firefighters.*
- *Four-person crews were able to complete critical search and rescue operations 30% faster than two-person crews and 5% faster than three-person crews.*

The United States Fire Administration, part of the Federal Emergency Management Agency in the Department of Homeland Security, recommends that a minimum of four firefighters respond on or with each apparatus. In its respected textbook *Managing Fire Services*, the International City/County Management Association (ICMA) states, *“that at least 4 and often 8 or more firefighters under the supervision of an officer should respond to fire suppression operations”*. They further state, *“If about 16 firefighters are not operating at the scene of a working fire within the critical time period then dollar loss and injuries are significantly increased, as is fire spread”*.

Beyond the NFPA standard(s), which as standards do not carry the weight of regulation or law, is the Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard, CFR 1910.134, which carries the weight and force of regulation, thus making compliance mandatory. One key provision of the Respiratory Protection Standard that is directly applicable to fire department staffing is known as the “Two-In/Two-Out” rule. In brief, this regulation specifies that anytime firefighters operate in an environment/atmosphere that is “immediately dangerous to life and health” (IDLH), whenever two members enter the IDLH area together/as a team, they must maintain visual or voice communication with two additional firefighters who must remain outside of the IDLH atmosphere, prepared to render immediate emergency assistance to those inside (Figure 34). The OSHA rule does provide an exception, however, which states that the rule does not apply in emergency rescue situations where a person is visible and in need of immediate rescue, or there is credible and reasonable information that potentially viable victims are still in need of rescue.

To comply with the “Two-In/Two-Out” rule, a team of four firefighters must be assembled before an interior fire attack can be made when the fire has progressed beyond the incipient stage, except in an imminent life-threatening situation when immediate action could prevent the loss of life or serious injury before the team of four firefighters is assembled. The serious concern of the MRI project team is that the OSHA “Two-In/Two-Out” rule permits an exception for life hazards or rescue situations. The reality is that in one of the most serious life-hazard fire situations that can be encountered, trapped civilians, a firefighter may need to place himself/herself in extreme danger by entering the structure alone.

The OSHA:” Two-In/Two-Out” rule is an essential component of operational safety and should be the basis of fire service operations within the study communities. Despite the rural nature of the area, and the reality of some elongated response times, interior operations beyond a visible rescue should not be initiated until four personnel arrive on the incident scene.

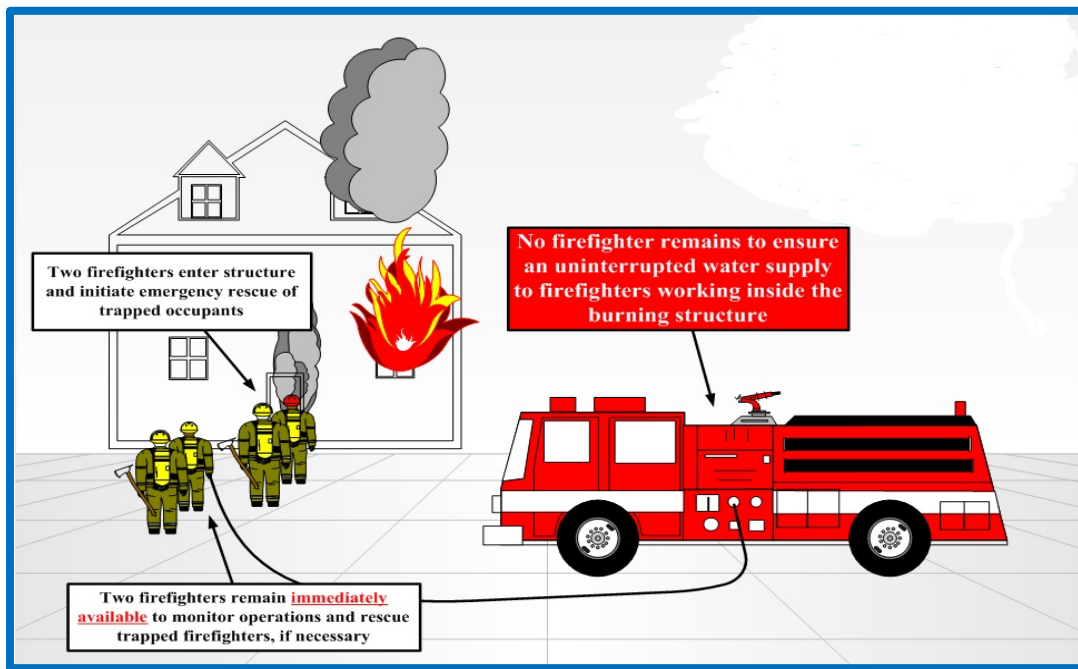


Figure 34
OSHA TWO-IN/TWO-OUT
Image Credit: IAFF 266

Paragraph 4.1, Fire Suppression Organization in NFPA 1720⁴ states, fire suppression operations shall be organized to ensure that the Fire Department’s fire suppression capability includes sufficient personnel, equipment, and other resources to deploy fire suppression resources

⁴ NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments, 2014 edition (National Fire Protection Association, Quincy, MA) outlines organization and deployment of operations by volunteer/call, and primarily volunteer/call fire departments.

effectively, efficiently, and safely. Paragraph 4.2.2, Community Risk Management, states the number and types of units assigned to respond to a reported incident shall be determined by risk analysis and/or pre-fire planning.

The operations necessary to successfully extinguish a structure fire, and do so effectively, efficiently, and safely, requires a carefully coordinated, and controlled, plan of action, where certain operations, such as venting ahead of the advancing interior hose line(s), must be carried out with a high degree of precision and timing. Multiple operations, frequently where seconds count, such as search and rescue operations and trying to cut off a rapidly advancing fire, must also be conducted simultaneously. If there are not enough personnel on the incident initially to perform all the critical tasks, some will, out of necessity, be delayed. This can result in an increased risk of serious injury, or death, to building occupants and firefighters, and increased property damage. It is important that all communities give and receive mutual aid to fires with appropriate staffing of at least 4 personnel, one of which should be an officer.

Paragraph 4.1, Fire Suppression Organization in NFPA 1720⁵ states, fire suppression operations shall be organized to ensure that the fire department's fire suppression capability includes sufficient personnel, equipment, and other resources to deploy fire suppression resources effectively, efficiently, and safely. Paragraph 4.2.2, Community Risk Management, states the number and types of units assigned to respond to a reported incident shall be determined by risk analysis and/or pre-fire planning.

The overall study has seen an increase in providing and receiving mutual aid from other area departments. This is a trend that has been increasing throughout the fire service in the country over the past few years. Most departments are requesting mutual aid sooner due in large part to the low level of staffing levels to allow for safe operations at incident scenes and also due to the larger fire volume and exposure threats that are being found.

At the time of this assessment, it appears that most departments do not have any minimum staffing requirements for their apparatus so vehicles can respond with just one or two personnel rather than a much more desirable minimum of three or the recommended four. It is MRI's opinion that most departments, with their current personnel resources, will rarely be able to get either sufficient apparatus or firefighters to the scene of a significant incident without turning to their neighboring departments for assistance. Paragraph 4.7.3 of NFPA 1720 states, that the fire department shall be allowed to use established automatic aid or mutual aid agreements to comply with the requirements of Section 4.7, Sustained Firefighting Operations. Paragraph 4.3.5, Staffing and Deployment states, that standard response assignments and procedures, including mutual aid response and mutual aid agreements predetermined by the location and nature of

⁵ NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2014 edition (National Fire Protection Association, Quincy, MA) outlines organization and deployment of operations by volunteer/call, and primarily volunteer/call fire departments.

the reported incident, shall regulate the dispatch of companies, response groups, and command officers to fires and other emergency incidents.

Challenges Facing Fire Service Staffing

The challenges that are facing the fire services in all of the departments in and around the study have sometimes been referred to as, *“a crisis without evidence”*. The MRI project team has heard this multiple times. But make no mistake, there is a crisis that is slowly building and has been for a considerable period. The reason that many stakeholders – municipal leaders and the general public – do not see “evidence” is the long tradition in both the fire and EMS services of “getting the job done”. It has long been known that when people have a problem they don’t know how to deal with, they call the fire department because two things are certain when they do: 1) the fire department will come, and 2) they will figure out how to deal with the problem or find someone that can/will.

The trouble is that fewer and fewer people are volunteering, and long-term volunteers are aging. The share of Americans who volunteer their time to help charities build houses, serve food, do environmental cleanup, and much else has been on rapid decline nationwide. Although volunteering to be a firefighter has been on decline the volunteer rate has further slumped in large part because of the pandemic. People are valuing their personal time more than ever. As a result, most communities are short-staffed and can’t fight fires as quickly or effectively as necessary. The lack of volunteers has grown so critical that most people in the industry consider it to be at the crisis stage without an end in sight.

The number of volunteer firefighters in the U.S. reached a low in 2020 and continues to decline. At the same time, call volume has more than tripled in the last 35 years, due in large part to the increase in emergency medical calls. Major factors contributing to recruitment challenges include increased time demands, more rigorous training requirements, and the proliferation of two-income families whose members do not have time to volunteer. Fire departments today are also expected to provide a wide range of services and multi-hazard responses, creating further challenges for resource-constrained departments.

SOURCES OF CHALLENGES	CONTRIBUTING FACTORS
Time Demands	<ul style="list-style-type: none"> • The two-income family and working multiple jobs • Increased training time demands • Higher emergency call volume • Additional demands within department (fundraising, administrative)
Training Requirements	<ul style="list-style-type: none"> • Higher training standards and new federal requirements • More time demands • Greater public expectation of fire department's response capabilities (broader range of services such as EMS, hazmat, technical rescue, etc.) • Additional training demands to provide broader range of services • Recertification demands
Increasing Call Volume	<ul style="list-style-type: none"> • Fire department assuming wider response roles (EMS, hazmat, technical rescue) • Increasing emergency medical call volume • Increase in number of automatic fire alarms
Changes in the "Nature of the Business"	<ul style="list-style-type: none"> • Abuse of emergency services by the public • Less of an emphasis on social aspects of volunteering
Changes in Sociological Conditions (In Urban and Suburban Areas)	<ul style="list-style-type: none"> • Transience • Loss of community feeling • Less community pride • Less of an interest or time for volunteering • Two-income family and time demands • "Me" generation
Changes in Sociological Conditions (In Rural Areas)	<ul style="list-style-type: none"> • Employers less willing to let employees off to run calls • Time demand • "Me" generation
Leadership Problems	<ul style="list-style-type: none"> • Poor leadership and lack of coordination • Authoritative management style • Failure to manage change
Federal Legislation and Regulations	<ul style="list-style-type: none"> • Fair Labor Standards Act interpretation • "2 in, 2 out" ruling requiring four firefighters on scene before entering hazardous environment • Environmental Protection Agency (EPA) live-fire burn limitations
Increasing Use of Combination Departments	<ul style="list-style-type: none"> • Disagreements among chiefs or other department leaders • Friction between volunteer and career members
Higher Cost of Housing (In Affluent Communities)	<ul style="list-style-type: none"> • Volunteers cannot afford to live in the community they serve
Aging Communities	<ul style="list-style-type: none"> • Greater number of older people today • Lack of economic growth and jobs in some towns
Internal Conflict	<ul style="list-style-type: none"> • Disagreements among departmental leaders • Friction between volunteer and career members

Retention & Recruitment for the Volunteer Emergency Services: Challenges & Solutions. National Volunteer Fire Council and United States Fire Administration (FA-310), May 2007

Figure 35 – Recruitment and Retention Challenges Root Causes

The age of volunteer firefighters is increasing. Departments are finding it difficult to attract younger members due to a range of reasons, including increased demands on people's time, longer commuting distances to and from work, the prevalence of two-income households, and increased training requirements.

Implications of Not Taking Action

Looking ahead, the implications of not acting will be quite simple: service levels will continue to diminish, and some emergency calls may go unanswered or be delayed to the point that intervention may not matter.

A fire department that can't respond to an emergency poses several serious problems:

- **Risk to Public Safety:** The primary role of a fire department is to protect the community from fires and other emergencies. If a fire department can't respond, the safety of the community is at risk.
- **Increased Damage:** The longer it takes for a fire department to respond, the more damage a fire can cause. This can result in increased property loss and potentially more severe injuries.
- **Liability Issues:** If a fire department can't respond it is placed in an indefensible position if the person requesting the assistance suffers a loss.
- **Mutual Aid Challenges:** When a large-scale emergency occurs, fire services often struggle to coordinate their response. Volunteer and combination departments, in particular, face challenges in securing mutual aid. When a request for additional response or mutual aid is delayed, harm or further loss is likely to increase.
- **Public Trust:** A fire department that can't respond to emergencies may lose the trust of the community it serves. This can have long-term impacts on the departments and the town's reputation and effectiveness.

In summary, a fire department that can't respond to emergencies can have serious consequences for public safety, property damage, liability, mutual aid, and public trust.

IX. Response Options Available to the Town of Madbury

Option 1 – Continue with a Volunteer Department

Option 1A – Continue as a mostly Volunteer Department

The Madbury Fire Department engages in an extensive recruitment and retention program with the goal of increasing staffing and establishing a short-term and immediate succession plan to replace longtime Fire Chief Tom Perley. Chief Perley has been and continues to be a tremendous asset to the department and the community, however, he has a desire to retire after 26 years of faithful and dedicated service to the Town of Madbury.

Recruiting new volunteer firefighters can be a challenging task. Here are some strategies that can help:

- **Community Outreach:** Increase your presence in the community through events, open houses, and local partnerships.
- **Social Media:** Use social media platforms to reach potential volunteers.
- **Website:** Ensure your department’s website includes detailed information about becoming a volunteer firefighter. Highlight the benefits, training provided, and frequently asked questions.
- **Targeted Advertising:** Use platforms like Facebook to target potential volunteers with advertising messages about your department.
- **Free Resources:** Utilize free resources like the National Volunteer Fire Council’s Make Me a Firefighter program. This program provides a slew of free resources and marketing for recruitment efforts.
- **Engage Former Military Personnel:** Former military personnel are accustomed to teamwork, discipline, and continuous training. They can be a valuable addition to your team.

The Town should collaborate with McGregor Ambulance to develop a recruitment and retention strategy. McGregor has been extremely successful in recruiting, training and managing volunteers over a long period of time. Much can be learned by their efforts and experience.

Remember, recruitment is just the first step. Retention of volunteers is equally important. Regular training, recognition of efforts, and creating a sense of camaraderie can help in retaining volunteers.

Recruitment and Retention Challenges

On February 23, 2022, NH Commissioner of Safety, Robert L. Quinn, established the Fire and EMS Recruitment and Retention Ad Hoc Committee under his authority as outlined in New Hampshire RSA 153- A: 7, III. Fourteen members were appointed and were tasked with developing recommendations to the Commissioner directed at State and Local changes or improvements that can be made to assist fire and emergency medical response organizations throughout New Hampshire in their efforts to recruit and retain members.

Although the committee met eleven times and published a 2022 Recruitment & Retention Report it is clear there are no quick fixes and recruiting and maintaining volunteers and call firefighters is a major undertaking, to say the least.



If this is the path the community wants to pursue it must realize that it is not only an uphill battle but would buck the national trend. Most, if not all successful volunteer agencies of this magnitude have paid full-time personnel assigned to recruitment, managing the volunteers as well as retaining the volunteers once they join the department.

The department could hire a full-time Fire Chief to manage the department including recruitment and retention efforts. MRI is engaged in a large amount of fire chief recruitment and hirings and has seen the pool of good, qualified candidates diminish. It is even more difficult in a department that only responds to 150-200 calls a year.

Even if the department were to hire a good, enthusiastic, hardworking Chief, the department workforce would still be a volunteer workforce with many of the challenges that Chief Perley faces today. Recruiting, training, and retaining volunteers in such a small department would be difficult as well. Without sufficient activity to keep the volunteers active and engaged they will not stay. The community may have invested thousands of dollars into training, gear and equipment just to have them leave.

Enhanced Volunteer Call Department		
Option 1 A- Sample Budget		
<u>Description</u>		<u>Budget</u>
Ambulance	\$	5,500.00
Salary - Fire Chief	\$	100,000.00
Wages - Clerical	\$	12,000.00
Wages- General Personnel	\$	5,070.00
Wages - Training Pay	\$	15,000.00
Wages- Call Firefighters	\$	30,000.00
Training / Tuition	\$	10,000.00
Telephone	\$	3,000.00
Software / Tech Support	\$	3,000.00
Dispatch Service	\$	4,500.00
Security System	\$	500.00
Conferences & Association Dues	\$	1,200.00
Property Repairs & Maintenance	\$	1,500.00
Vehicle Fuel	\$	3,000.00
Supplies	\$	1,500.00
Equipment Repairs & Maintenance	\$	6,000.00
Vehicle Repairs & Maintenance	\$	8,000.00
Uniforms	\$	10,000.00
EMS Supplies	\$	1,500.00
Protective Gear	\$	20,000.00
Equipment & Machinery	\$	27,000.00
Forest Fire	\$	500.00
Advertising	\$	4,000.00
Recruitment and Retention Campaign	\$	8,000.00
Ambulance	\$	5,500.00
Station supplies and utilities	\$	8,000.00
Fire Department Total	\$	294,270.00

Figure 36 – Option One A - Budget Projection

Option 1B – Develop a Student Live- In Program

A student firefighter live-in program is designed to increase staffing at the fire department while providing benefits to the live-in student firefighter as an incentive. These programs are most successful when there is a local college or university nearby. The presence of the University of NH (UNH) makes this option a potential possibility. There are examples of successful programs across the country as well as a couple nearby. The programs at Southern Maine Community College (South Portland, ME) and Lakes Region Community College (Laconia, NH) are both successful. Both have student/firefighters in numerous fire houses across the region.

In exchange for free living accommodations, the live-in members are responsible for responding to emergency calls, performing station duties, and participating in training. The program allows firefighters to utilize the station as their full-time residence, enabling a quick and professional fire department response.

Benefits of the program may include free dorm-style private living space, laundry, cable TV, computer access, high-speed Internet & Wi-Fi, advanced fire certifications, use of fitness & physical training equipment, uniforms & gear, and full kitchen & food storage facilities.

Public Safety Student Live-In Program

The members of SMCC's Public Safety Student Live-In Collaborative - 15 area community partners and SMCC -- are dedicated to providing the highest degree of risk reduction and emergency services to the communities they serve, developing full-time SMCC students into "career-ready" professionals and supporting students' academic success.

Who is eligible to Serve as a Live-in Student?

Students enrolled full-time in any academic program at Southern Maine Community College are eligible to serve as one of our 90 live-in students as long as they agree to complete basic fire and EMS training and serve as a community responder. If chosen, you will receive state-of-the-art training and certification, become involved in fire prevention, life safety education, fire and EMS emergency operations and a variety of other community services. You will also live in a fire-EMS station for free (saving thousands of dollars per year) and receive hourly pay for responding to emergency calls.

The program is a partnership of excellence among Southern Maine Community College and 15 participating communities (30 fire-EMS stations). Participation in this program will enrich your college experience, lower your education costs and add important community service credentials to your resume!

From their website - [Public Safety Student Live-In Program | Fire Science | My SMCC \(smccme.edu\)](#)

Each program has its own set of standards and requirements to which the member must agree in exchange for a place to reside. For example, some programs may require certain qualifications such as CPR, First Aid, Infectious Control, Hazmat Awareness/Operations, NIMS 100,200,700, Nationally Recognized Fire Fighter I & II Certifications, Basic Vehicle Rescue - Technician, RIT Training etc.

It's important to note that the specifics of these programs can vary widely depending on the fire department and program.

The one caveat to having a firefighter live in program would be living space for the firefighters. This may require an addition to the fire station or at least a renovation of some of the existing areas which would include the repurposing of the community/ training room into living space, at a minimum.

The cost of expanding a fire station can vary greatly depending on several factors, including the location, the materials used, and more. Here are some estimates:

A fire station construction cost was \$50-60 per square foot forty years ago, but this average has risen to \$250-\$500 per square foot today.

Firefighter Student Live-In Program	
Option 1B - Capital Budget	
<u>Description</u>	<u>Budget</u>
Renovation or addition for living Space	\$1,000,000

Figure 37 – Projected Cost of Renovations for Student Live in Program

Please note that these are estimates and the actual cost can vary. For a more accurate estimate, it would be best to consult with a local construction company or local architect.

The capital expense could be bonded over a period of time, such as 20 years. This would keep the annual cost down and may make this option more affordable.

Student Live-In Program

Option 1B - Sample Budget

<u>Description</u>	<u>Budget</u>
Salary - Fire Chief	\$ 100,000.00
Wages - Clerical	\$ 12,000.00
Wages- General Personnel	\$ 5,070.00
Wages - Training Pay	\$ 15,000.00
Wages- Call Firefighters	\$ 30,000.00
Training / Tuition	\$ 10,000.00
Telephone	\$ 3,000.00
Software / Tech Support	\$ 3,000.00
Dispatch Service	\$ 4,500.00
Security System	\$ 500.00
Conferences & Association Dues	\$ 1,200.00
Property Repairs & Maintenance	\$ 1,500.00
Vehicle Fuel	\$ 3,000.00
Supplies	\$ 1,500.00
Equipment Repairs & Maintenance	\$ 6,000.00
Vehicle Repairs & Maintenance	\$ 8,000.00
Uniforms	\$ 10,000.00
EMS Supplies	\$ 1,500.00
Protective Gear	\$ 20,000.00
Equipment & Machinery	\$ 27,000.00
Forest Fire	\$ 500.00
Advertising	\$ 4,000.00
Recruitment and Retention Campaign	\$ 8,000.00
Ambulance Contract	\$ 5,500.00
Station supplies and utilities	\$ 12,000.00
Fire Department Total	\$ 294,270.00

Figure 38 – Operational Budget Project for Student Live In Program

Option 2 – Transition to a Combination Department

Option 2A – Full Coverage 24/7 - 3 Person Engine

Many volunteer departments are seeking to transition to paid departments or a hybrid of full time and call firefighters. Even locales where volunteer departments are still workable are beginning to see the handwriting on the wall.

The Town of Madbury could transition to a combination department by adding a full-time Fire Chief for leadership and a level of paid firefighting staff that would ensure adequate response for the residents.

The goal of adding personnel is to ensure firefighters are ready and available when an emergency occurs. There is no question that adding paid staff would provide a higher level of protection than the citizens currently are accustomed to by having reduced response times and greater reliability.

A major consideration in any transition from volunteer to paid fire departments is funding, both for the immediate transition and to maintain the additional costs over time. The worst-case scenario is to create a paid department, put people on duty, buy vehicles and equipment, and then not be able to afford it over time.

Paying firefighters will be a new cost to consider, but existing costs will remain. Newly paid departments will need to consider their existing costs, including operating costs, capital improvements, facilities replacement and maintenance, and the apparatus replacement schedule.

Costs will likely increase over time, so looking ahead 10 years or so can make sure a transitioning department is equipped to adapt over time. Costs to consider include capital outlays for facilities and equipment, payments for bonds and leases, and providing any incentives to encourage firefighters to stay and not get recruited away.

The transition from volunteer/call staff to paid staff is not an easy decision. Not only does this decision come with the need for a considerable investment, but it comes with all the logistical concerns of starting a new business, including personnel management.

To provide a level of protection for the town of Madbury to meet the national staffing standards and provide a safe level of response for the emergency personnel, we would recommend a staffing level of three (3) personnel on duty 24/7. This would require 4 shifts, therefore, there would be a total of 12 full-time personnel would be required. In order to meet minimum standards and provide proper supervision on each shift, the proposed staffing plan would include one (1) supervisor (Captain or a Lieutenant) and two (2) Firefighters assigned to each shift.

Madbury's Own Combination Department

Option 2 - Sample Budget

<u>Description</u>	<u>Budget</u>
Salary - Fire Chief	\$ 100,000.00
Wages - Clerical	\$ 12,000.00
Wages and Benefits (See employee cost Breakdown)	\$ 1,225,336.92
Wages- Call Firefighters	\$ 10,000.00
Training / Tuition	\$ 10,000.00
Telephone	\$ 3,000.00
Software / Tech Support	\$ 3,000.00
Dispatch Service	\$ 4,500.00
Security System	\$ 500.00
Conferences & Association Dues	\$ 1,200.00
Prop Repairs & Maintenance	\$ 1,500.00
Vehicle Fuel	\$ 3,000.00
Supplies	\$ 1,500.00
Equipment Repairs & Maintenance	\$ 6,000.00
Vehicle Repairs & Maintenance	\$ 8,000.00
Uniforms	\$ 10,000.00
EMS Supplies	\$ 1,500.00
Protective Gear	\$ 20,000.00
Equipment & Machinery	\$ 27,000.00
Forest Fire	\$ 500.00
Advertising	\$ 2,000.00
Recruitment and Retention Campaign	\$ 5,000.00
Ambulance Contract	\$ 5,500.00
Station supplies and utilities	\$ 12,000.00
New Employee Start Up Costs (See new employee cost breakdown)	\$ 9,685.00
Fire Department Total	\$ 1,482,721.92

Figure 39 – Projected Budget Transitioning to a Combination Department

The following represents a breakdown of new employee cost from the proposed budget.

Full -Time Employee Salary and Benefits		
Firefighter/EMT	\$97,003.93	See Employee Cost Breakdown
Lieutenant	\$112,326.37	See Employee Cost Breakdown
Start Up Expenses		
Turnout gear	\$5,000.00	5-year replacement schedule
SCBA Mask & Bailout equipment	\$650.00	single time expense
Class A Uniform	\$750.00	single time expense
Duty Uniforms	\$1,000.00	partially recurring
Winter jackets/mittens	\$325.00	single time expense
Duty boots	\$150.00	recurring
Pre-Employment Physicals	\$1,200.00	single time expense
Pre-Employment Background Investigation	\$300.00	single time expense
Pre-Employment Dept. of Motor Vehicles Records check	\$25.00	single time expense
Pre-Employment Dept. of Safety Criminal Background Check	\$35.00	single time expense
Misc. new-hire expenses	\$250.00	single time expense
TOTAL (Per new employee)	\$9,685.00	

Figure 40 – Employee Cost Breakdown

Please note that the Capital Costs (as outlined earlier) would still need to be expended.

Firefighter Student Live-In Program	
Option 1B - Capital Budget	
<u>Description</u>	<u>Budget</u>
Renovation or addition for living Space	\$1,000,000

Even if the town agreed to expenses for this option, it would still face challenges competing with larger full-time departments to hire employees and retain employees.

Option 2 – Transition to a Combination Department

Option 2B – Modified Coverage

The difference between Option 2A and Option 2B is the level and type of staffing, which determines the cost. For example, the Town of Lee staffs their station with at least 2 personnel, this is accomplished with 1 full-time person, 1 part-time person and the Chief or Assistant Chief covering during the week.

Lee Staffing Breakdown	Schedule
Chief- Full Time	Salaried - Monday through Friday
Assistant Chief- Part Time Hourly	Hourly - Tuesday through Thursday
Deputy Chief- On Call Hourly	Hourly as needed
4-Full Time (Lieutenants)	Hourly Rotating Schedule
12- Part Time (Lieutenants/Firefighter/EMTs)	Hourly 12-hour shift - as scheduled
On Call Firefighters	On call as needed

Figure 41 – Combination Staffing Overview

Although a 2-person response does not meet the NFPA Standards, the standards are not law, and a jurisdiction determines their level of staffing. This budget is based on wages paid by Lee which may not be competitive with area departments. Although the use of part time or per diem firefighters is an option that is used in Lee and Barrington, it is getting harder and harder to fill these shifts. In a department with low call volume this challenge is magnified. Even filling full time firefighter positions in a small department is difficult. The Town of Greenland has been attempting to fill an opening for more than 6 months without success.

For comparison purposes the Lee Fire Department budget is
\$657,407.00



Option 3 – Contract with Neighboring Community

Option 3A – Contractor Staffs Madbury Station

The Town of Madbury could contract with a neighboring community to provide fire protection and emergency services to the community. This would mean the Town of Madbury would/could eliminate its fire department and allow another community to protect the residents.

The goal of contracting emergency services is to provide a higher level of protection than the citizens currently are accustomed to, or at least an equal level of response. This is accomplished through reduced turnout time, thereby reducing current response times.

Not entirely a foreign concept for Madbury as the community already does this with McGregor Memorial Ambulance for EMS treatment and transport.

Under Option 3 A & B, a neighboring community would provide full fire protection services, which means they would provide all the logistics to do so, including providing fire equipment and apparatus, personnel and personnel management and headaches that go along with running a fire department.

Under Option 3A the community would be asked to staff the Marbury Fire Station at a staffing level of three (3) personnel on duty 24/7. Once again, this would require 4 shifts, therefore, a total of 12 full-time personnel would be required. In order to meet minimum standards and provide proper supervision on each shift, the proposed staffing plan would include one (1) supervisor (Captain or a Lieutenant and two (2) Firefighters assigned to each shift.

It is estimated that the cost of a contract to provide this level of service would be between \$1,250,000 and \$1,550,000 annually.

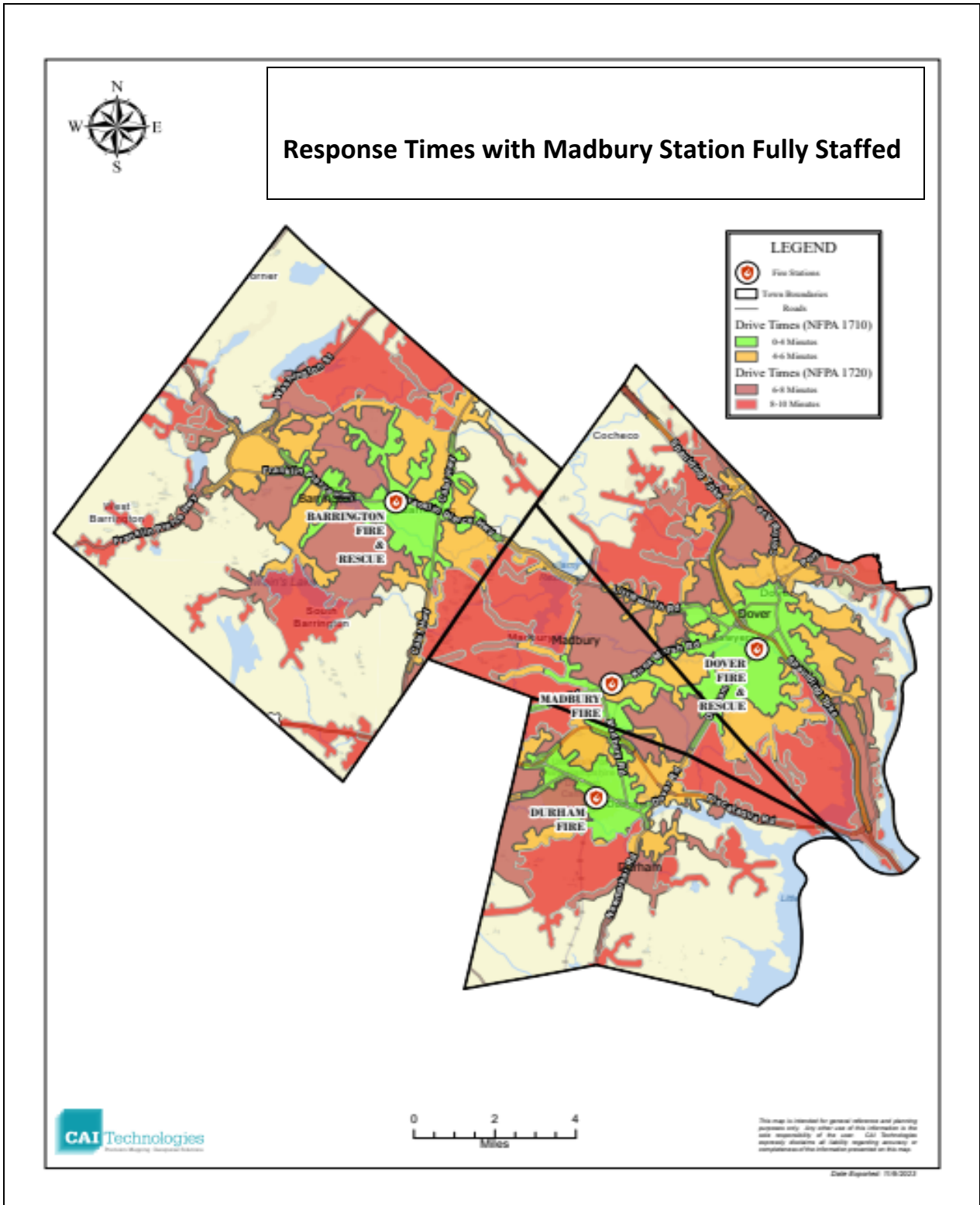


Figure 42 – Response time Mapping Madbury Station Staffed

Option 3 – Contract with Neighboring Community

Option 3B – Contractor Response from Own Station

Under Option 3B the neighboring community would be asked to provide 24/7 fire protection and emergency services to the town from their existing stations. Because they provide the service from their station and have their own personnel, they would determine if additional staffing needed to be added or not. Again, they would be providing all the logistics to do so, including providing fire equipment and apparatus, personnel and personnel management as well as managing the headaches that go along with running a fire department.

It is estimated that the cost of a contract to provide this service would be between \$350,000 and \$700,00 annually depending on what services are needed and negotiations with a neighboring community.

Potential contracting partners for 3A or 3B

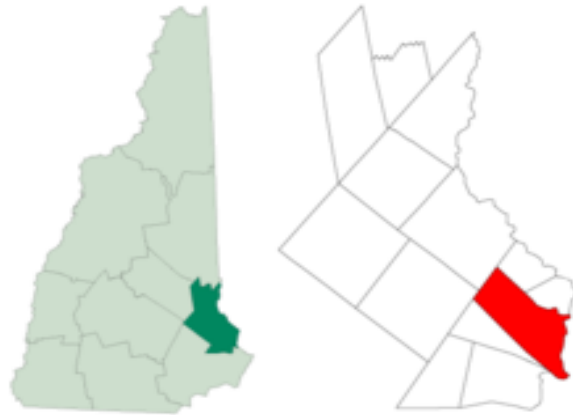
The possibility of contracting with another community would only be feasible for communities that are contiguous to the Town of Madbury. These include Dover, Durham, Barrington, and Lee. Initial inquiries from Chief Perley indicated that the Town of Lee was not interested in having discussions pursuant to a collaborative venture with Madbury at this time, therefore they were eliminated from the discussion as a potential partner.

This research has included the Towns of: Dover, Durham, and Barrington.

City of Dover

The City of Dover is a 29-square-mile city with a population of 32,741 (2020 census). It is the 5th most populous city in the State of New Hampshire which makes it the most populous community of the seacoast. The city continues to grow and has had the third-largest growth in the seacoast from 2010-2020.

The city of Dover abuts the town of Madbury more than any other community.

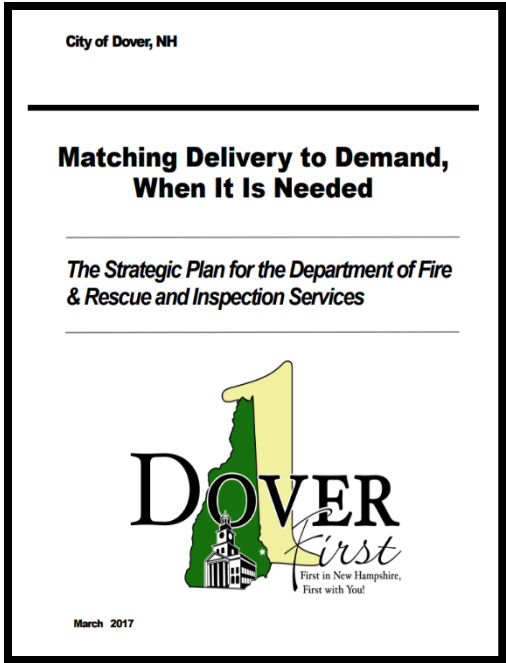


City of Dover Fire & Rescue



The City of Dover Fire and Rescue is a full-time paid fire department that operates out of three fully staffed fire stations. The department does not use a call, per diem, or volunteers as part of their suppression forces. This full-time cadre includes the daily staffing of fifteen (15) suppression personnel. Personnel are equally divided among the three fire stations. Each of the three stations operates two front-line apparatus as follows:

- One paramedic-level ambulance staffed with two firefighters (at least one of which is a paramedic).
- One fire suppression apparatus was staffed with one company officer and two firefighters.



The City of Dover has an approved Strategic Plan that was published in 2017 and covers a period of 2017 – 2022. [Strategic Plan Fire.pdf \(nh.gov\)](#)

Vision Statement

“To prevent harm, stop harm as fast as possible, and help with the recovery from harm.”

Mission Statement

“Utilizing exceptional customer service, our mission is to provide the community with information, education, services and representation, improving its quality of life and enhancing our citizen’s ability to survive and recover from the devastation of fire, environmental, natural and man-made emergencies.”

Call Volume

The City of Dover Fire & Rescue is a busy fire department that has seen call volume rapidly increase over the past few years.

NFIRS	2023	2022
100 Fires	136	125
200 Rupture Explosion	5	4
300 Rescue and EMS	4843	4745
400 Hazard Condition	520	311
500 Service Call	999	858
600 Good Intent	456	421
700 False alarm or call	706	659
800 Severe Weather	5	3
900 Special Incident	1	2
TOTAL	7671	7128

Figure 43 – Dover Fire Rescue Call Volume





City of Dover, NH
Organizational Staffing Chart

**Fire Department
Suppression**

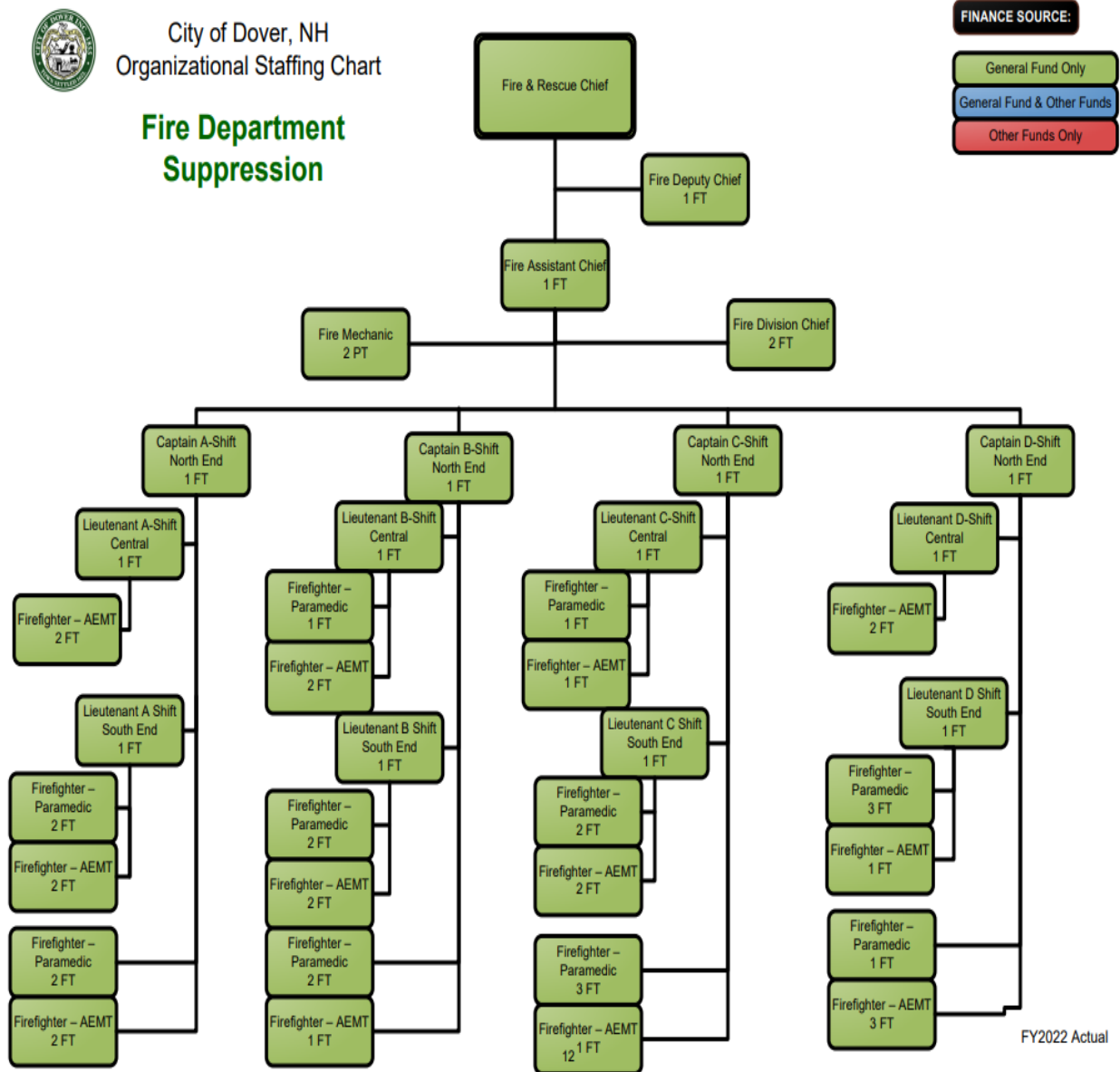


Figure 44 – Dover Fire Rescue Organizational Chart



Liberty North End Fire Station

262 Sixth St.

This station serves as the current headquarters for Dover Fire & Rescue and Inspection Services. Built in 2008, this station is staffed daily with Chief Officers, suppression personnel and Inspection Services.



Figure 45 – Dover Fire Rescue Liberty Fire Station

Dover Fire & Rescue has five chief officers:

- Fire Chief
- Deputy Chief
- Assistant Chief
- Division Chief of Emergency Medical Services
- Division Chief of Training & Safety

Each chief officer workdays, but provides 24/7 city-wide chief coverage every fifth week. Chief officers respond from the North End Station during business hours and respond from home during nights, weekends, and holidays. Multiple alarm incidents will receive multiple chief officers.

Station Staffing

- 1 Captain (Shift Commander)
- 1 Paramedic/Firefighter
- 3 Firefighters

Station Apparatus

- Engine 1 – 2011 Spartan/Smeal
- Truck 1 – 2008 Spartan/Smeal
- Squad/Rescue 1- 1997 Hackney
- Ambulance 1 – 2020 PL Custom

NOTE: As of July 1, 2024 Inspection Services is no longer overseen by the fire department.

Central Fire Station

9-11 Broadway

Central Station, built in 1899, served as the headquarters for over 100 years.

Once a busy headquarters station it is now a substation.



Figure 46 – Dover Central Fire Station

Station Staffing

- 1 Lieutenant
- 1 Paramedic/Firefighter
- 3 Firefighters

Station Apparatus

- Engine 2 – 2015 Spartan/Smeal
- Engine 6 – 1995 Becker
- 2018 Ram 4500 /Skid
- Ambulance 5 – 2010 Marque

South End Fire Station

25 Durham Road

South End Fire Station was built in 1967.

Approximately 15 years ago another bay and a second floor was added. The third bay is used by the fire department mechanic.



Figure 47 – Dover South End Fire Station

Station Staffing

- 1 Lieutenant
- 1 Paramedic/Firefighter
- 3 Firefighters
- Fire Department Mechanic (P/T)

Station Apparatus

- Engine 8 – 2011 Smeal
- Ladder 3 – 2018 E One 100' Quint
- Engine 6 – 1995 International
- Ambulance 7 – Fore F450
- Ambulance 5 – 2008 E450
- Utility 2 – 2015 Fore Explorer
- Utility 1 – 2016 Ford F350

Emergency Dispatch

The City of Dover operates a combined public safety dispatch center that is located in the Dover Police Department facility.



The following represents mapping and modeling of the estimated response time to the town of Madbury from the existing Dover South End Fire Station. This includes the following assumptions:

- Call Answering Time – 15 Seconds
- Alarm Processing Time – 60 Seconds
- Turnout Time – 80 Seconds
- Travel Time – (Code 3 – Lights and siren)

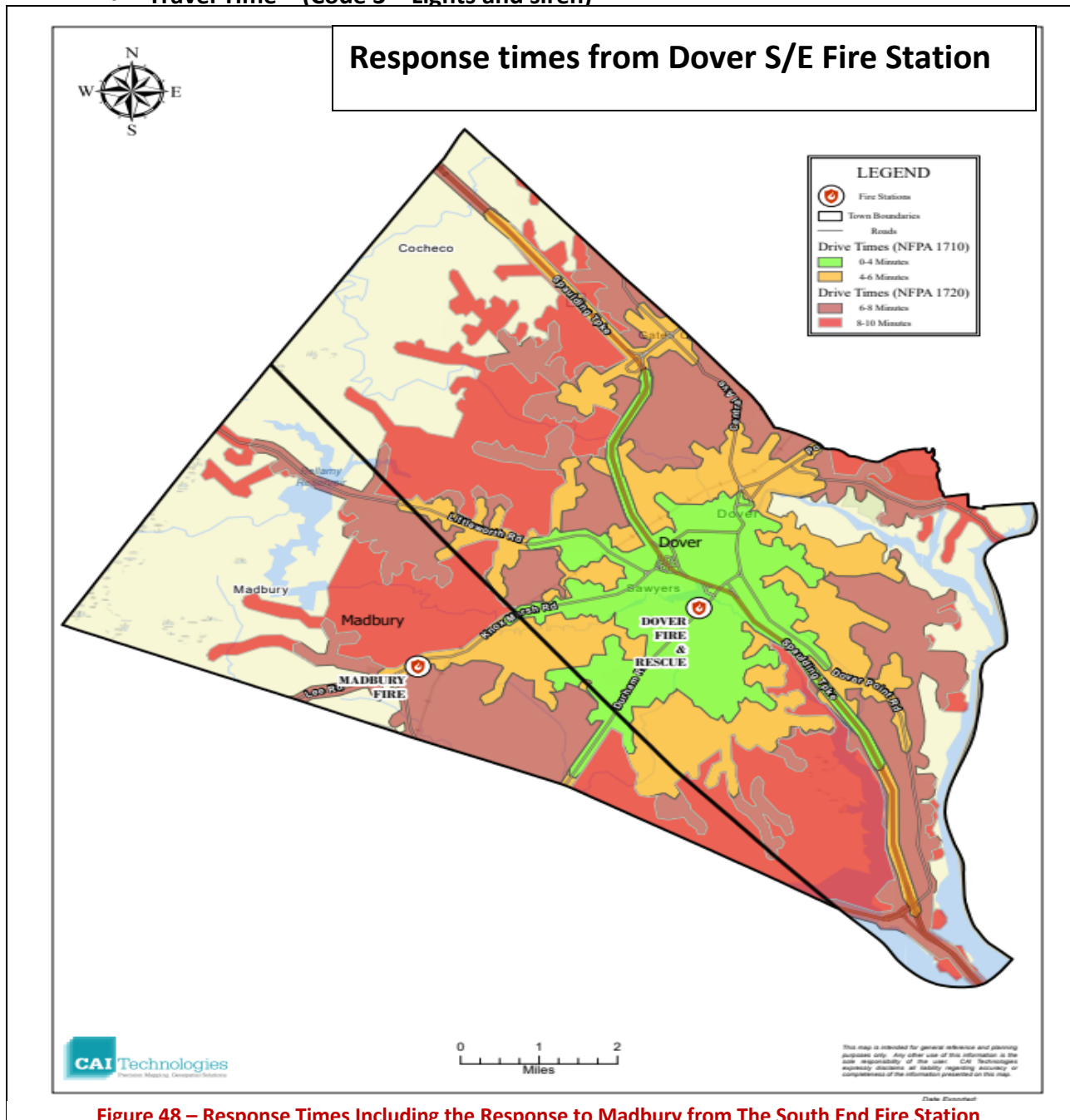
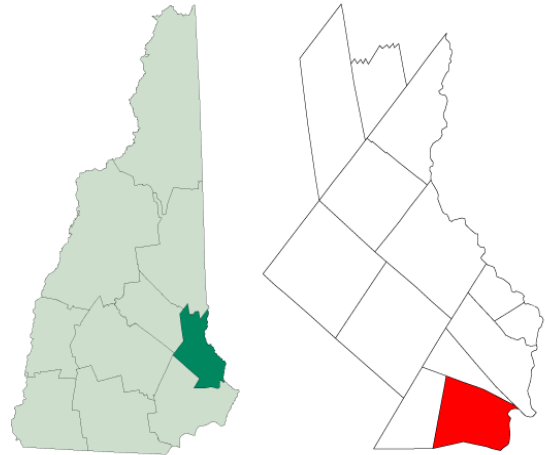


Figure 48 – Response Times Including the Response to Madbury from The South End Fire Station

Town of Durham

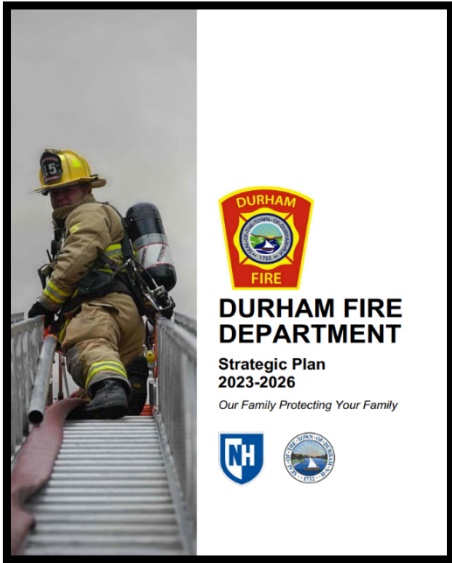
The town of Durham is a 22.4 square-mile city with a population of 14,473 (2020 census). It is the 20th most populous city/town in the State of New Hampshire. Durham is also home to the University of New Hampshire which boasts a 2022 student enrollment of just over 13,200 students on the Durham campus and approximately 4,000 employees.



Durham Fire Department



The Durham Fire Department is a full-time paid fire department that operates out of one fire station. The department supports a daily staffing level of five (5) suppression personnel. The department does have a call department, however, there are only three (3) call firefighters as members at this time. The department does respond to emergency medical incidents, however, does not provide EMS transport service. This is provided by McGregor Memorial Ambulance.



The Town of Durham has an approved Strategic Plan that was just published and covers a period of 2023 – 2026. [DFD Plan 12 28 23 \(durham.nh.us\)](https://www.durham.nh.us/plan-12-28-23)

Mission Statement

We, the Durham Fire Department, are an organization of dedicated professionals whose purpose is to provide Fire, EMS, Rescue, Prevention, and Education services to protect lives, property, and the environment for our community.

Call Volume

The Town of Durham Fire Department is relatively busy and has seen call volume increase over the past three years.

NFIRS Categories	2023		2022	
100 Fires	51		48	2%
200 Rupture Explosion	2	0%	3	0%
300 Rescue and EMS	1490	58%	1289	58%
400 Hazard Condition	72	3%	52	2%
500 Service Call	238	9%	167	8%
600 Good Intent	91	4%	98	4%
700 False alarm or call	638	25%	551	25%
800 Severe Weather	8	0%	15	1%
900 Special Incident	1	0%	2	0%
TOTAL	2591		2225	

Figure 49 – Durham Fire Call Volume

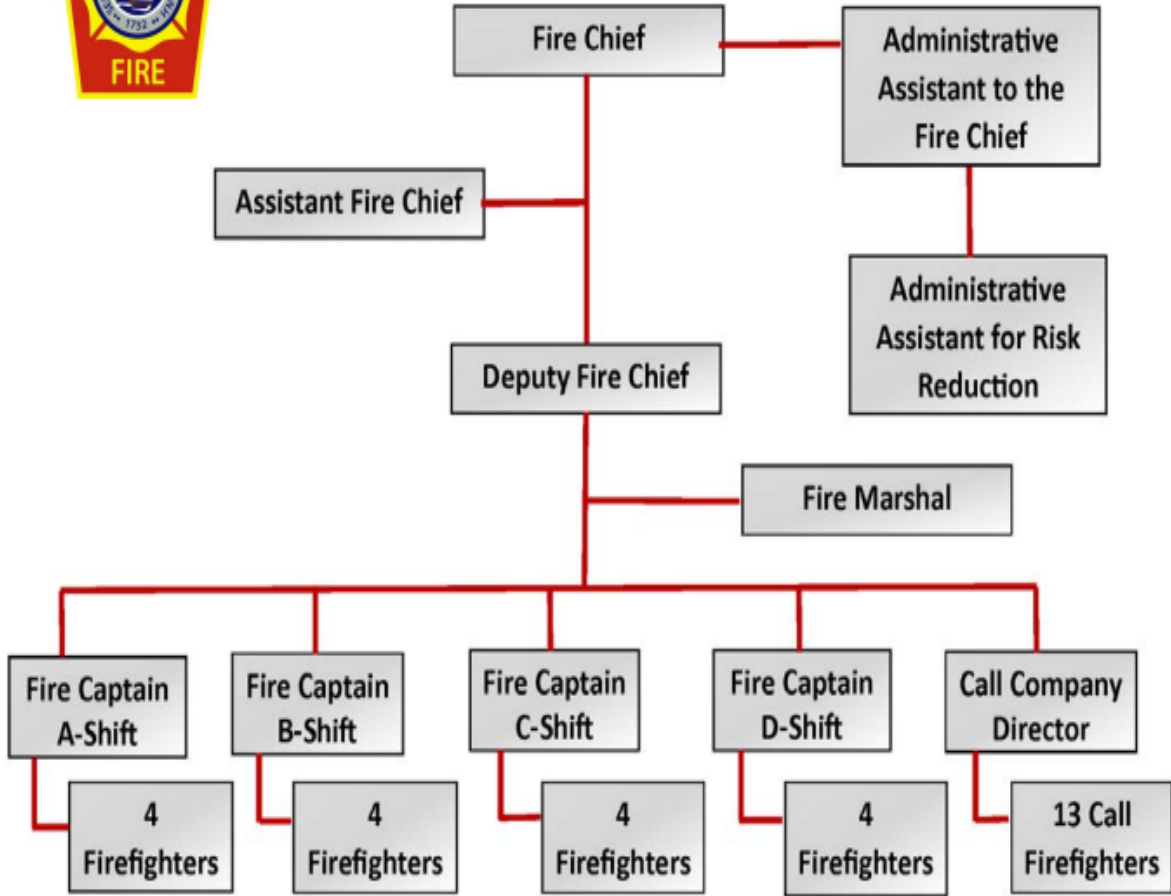


Figure 50 – Durham Fire Organizational chart

Fire Headquarters

51 College Road

This is Durham's only fire station, which is cramped, and has no room for expansion. Over the years there has been discussion of building a new fire station.



Figure 51 – Durham Fire Headquarters

Station Staffing

- 1 Captain
- 4 Firefighters

Staffing

- 1 Chief
- 1 Asst Chief
- 1 Deputy Chief
- 2 Admin Staff
- 1 Fire Marshal

Station Apparatus

- Engine 1 – 2015 Marion
- Engine 2 – 2018 Marion
- Tank 4 - 2010 Marion (1500 gallon)
- Rescue 1 – 2001 International
- Truck 3 – 2016 Ferrara (110 ft)
- Medic 1 – 2010 4x4
- Forestry 1 – 2007 F 350 -Skid
- Utility 1 – 2013 2500 Pickup

Emergency Dispatch

The town of Durham utilizes Strafford County to provide emergency dispatching services for the Fire Department.



The following represents mapping and modeling of the estimated response time to the town of Madbury from the existing Durham fire Station. This includes the following assumptions:

- Call Answering Time – 15 Seconds
- Alarm Processing Time – 60 Seconds
- Turnout Time – 80 Seconds
- Travel Time – (Code 3 – Lights and siren)

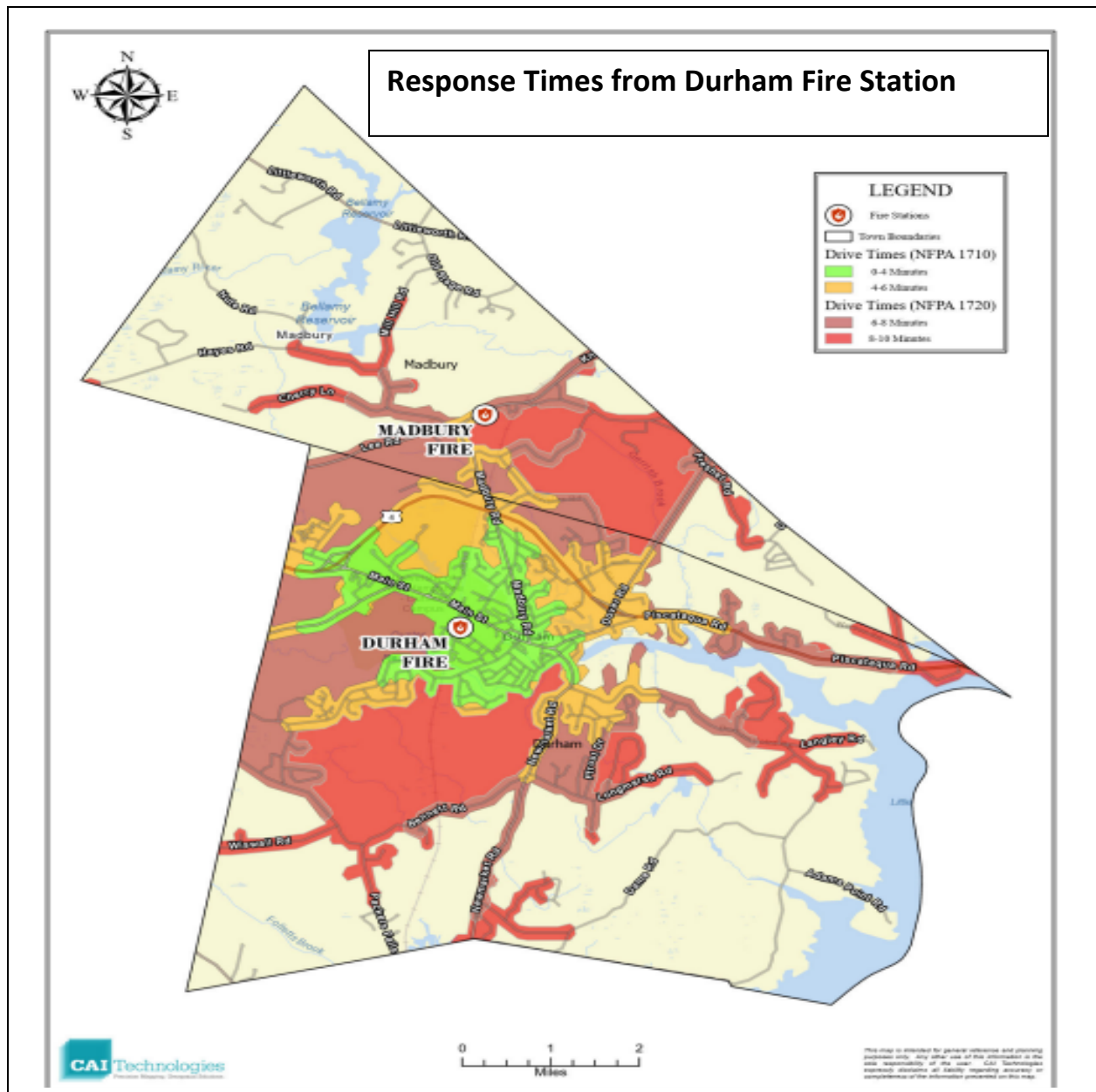
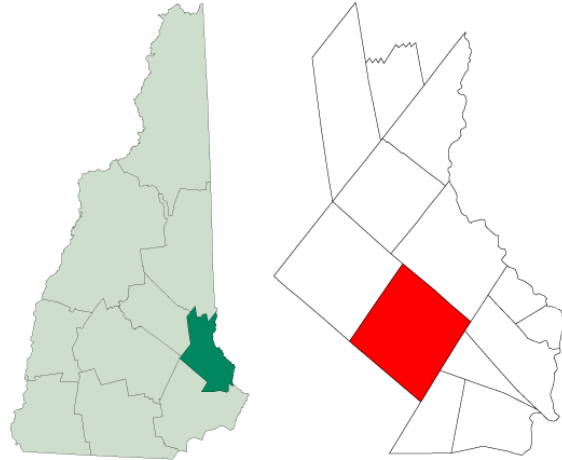


Figure 52 – Durham Fire Response Times from Durham Headquarters Including Response to Madbury

Town of Barrington

The town of Barrington is a 48.6 square-mile community with a population of 9,326 (2020 census). Barrington is considered a woodland, farm, and commuter town.



Barrington Fire Department



The Barrington Fire Department is a combination department with a full-time paid Chief. The department supports daily staffing levels of 2-3 with full-time firefighters and per diem (part time) firefighters. The department does have an active call department.

"Our Family Helping Yours"

Mission Statement

Our mission is to adequately provide highly trained and skilled emergency services, that our residents and guests expect during their time of need.

Call Volume

The town of Barrington Fire Department has a call volume that has been fairly stable over the past three (3) years.

INCIDENTS	2023	2022
Emergency Medical Aid	715	785
Motor Vehicle Crashes	78	75
Tree Down on Wires	43	23
Commercial Fire Alarms	37	33
Ambulance Assists	34	22
Carbon Monoxide Det. Activations	34	11
Illegal Burning	34	18
Residential Fire Alarms	20	23
Service Calls	18	18
Structural Fire Response	17	15
Brush Fires	15	13
Cover Assignments	14	16
Smoke Investigations	11	3
Smoke Det. Activations	8	9
Trees Down no Wires	7	14
Odor Investigations	6	7
Vehicle Fires	6	1
Good Intent Calls	5	8
Animal Rescue	4	1
Lost Person	4	1
Residential Lockouts	4	3
Propane Leak	3	0
HAZMAT Incident	3	3
Misc. Incidents	11	36
TOTAL	1131	1138

Figure 53 – Barrington Fire Call Volume

Mutual Aid	2023	2022
Received (Total)	28	37
Given (Total)	39	47

Figure 54 – Barrington Fire Mutual Aid Profile

Headquarters

774 Franklin Piece Highway

The fire department shares the Barrington Public Safety building with the Police Department. The building was constructed in 1999/2000. Recently there have been discussions about expansion/renovation.



Figure 55 – Barrington Fire Headquarters

Station Staffing

- 2 Firefighters 24/7
- 1 Firefighter M-F 7:00 – 17:00

Station Apparatus

- Engine 1 – 2001 Smeal
- Engine 2 – 2007 Smeal
- Tank 4 - 2020 Freightliner (2000 gallon)
- Rescue 1 – 2006 Chev Light Rescue
- Ambulance 1 – 2017 Ford E450
- Ambulance 2 – 2008 Ford E450
- Forestry 1 – 1993 F 350 -Skid
- Utility 1 – 2017 2500 Pickup

Emergency Dispatch

The town of Barrington utilizes UNH Fire Alarm to provide emergency dispatching services for the Fire Department.



The following represents mapping and modeling of the estimated response time to the town of Madbury from the existing Barrington Fire Station. This includes the following assumptions:

- Call Answering Time – 15 Seconds
- Alarm Processing Time – 60 Seconds
- Turnout Time – 80 Seconds
- Travel Time – (Code 3 – Lights and siren)

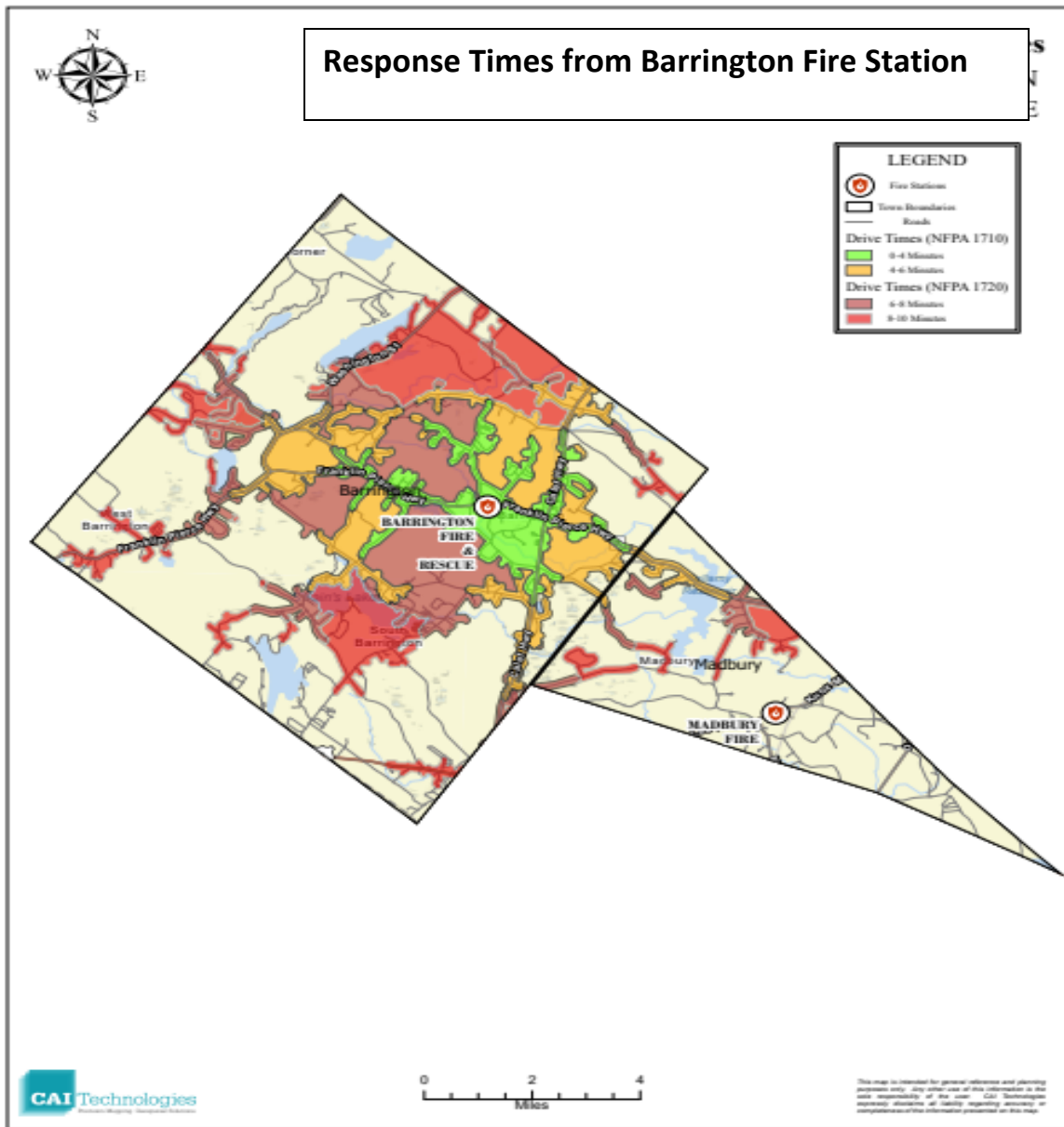


Figure 56 – Barrington Fire Response Mapping including Madbury

X. CONCLUSION AND RECOMMENDATION

Following all the research this report required, the team's conclusion is Chief Perley and the Madbury Board of Selectman were correct in requesting a review of their fire protection situation. As previously stated, despite a dedicated and highly respected Chief and a small group of dedicated volunteers, fire protection in Madbury is not where it needs to be to provide the expected service level to the community. In short, the level of fire protection in Madbury is on the verge of a crisis.

Although there have only been a few times the department could not get a fire engine on the road for an emergency, and it has not had dire consequences, it may only be a matter of time before the unthinkable happens. The odds of a crisis happening will be greatly increased when Chief Perley retires. He has been the glue that holds together the limited resources and has saved the community thousands and thousands of dollars.

With that said, the Town of Madbury has numerous options when it comes to their future fire protection. The two major factors that should be considered are the "Level of Service," i.e. response times and staffing level, and the overall costs. Certainly, having a fully staffed engine company with well-trained on-duty firefighters responding from the Madbury station offers the greatest level of protection for the residents, however, the call volume would not justify the approximately \$1,500,000 annual cost.

On the other hand, keeping the fire department as a call/volunteer with some recruiting efforts is the least expensive option, however, not having a guaranteed quick and efficient response may not justify the savings.

Although a "Student Firefighter Live-in Program" may be a reasonable option, it does come with a considerable capital investment and a fair amount for planning and logistics, as well as an extended time frame to get up and running.

The geographic make up of Madbury and surrounding communities allows for a neighboring community to provide a reduced response time and guarantee a fully staffed, well trained, engine company to respond even if responding from their own existing fire station.

Recommendation

Based on our review and evaluation MRI considers the best option for the Town of Madbury is:

Option 3B – Contracting with a neighboring community to provide fire protect from an existing station.

Recommendation I – The Town should enter into negotiations with both the City of Dover and the Town of Durham and receive proposals to provide fire protection and emergency Services response.

- *Dover provides the best response coverage based on mapping and modeling, however, they could not support that Madbury call department member who still wants be involved.*
- *Durham could accommodate the Madbury call department members who want to stay involved.*
- *Barrington could provide the service; however, response time mapping does not provide the increased coverage or rapid response that Dover and Durham provides.*
- *Transitioning from a volunteer department to a contracted department that provides staffed 24-hour coverage response times are expected to be roughly equivalent in that the time for Madbury Fire Department personnel to respond from home is replaced by the travel time associated with the more distant deployment of the contracted options.*

Recommendation II – The Town should consider appointing the Police Chief as the Town Emergency Management Director or include these duties in the negotiations list above.

Recommendation III - The Town should transfer all Fire and Life Safety inspections to the Town's Building Inspector.

Recommendation IV - The Town should consider appointing a committee to discuss the short-term use of the fire station should fire protection be contracted out. We would be happy to facilitate that discussion and selection process upon request.

THE RECOMMENDED PATH FORWARD

Although there are several recommendations outlined in this report the MRI Team believes that after weighing the service levels to the community, the capital expenditures, the operating budget, and the desired level of protection, the most advantageous course of action for the community is to implement Option 3B by entering negotiations with one of the neighboring communities to provide fire protection services from that community's existing fire station.

The team recommends entering negotiations with the Town of Durham over the City of Dover and the Town of Barrington.

- 1) **Town of Durham** – Durham should be the first choice for the following reasons:
 - a. Provides increased fire protection by reducing response times.
 - b. Can accommodate members of the Madbury call/volunteer department who still want to serve the community.
 - c. Madbury's existing frontline fire engine is based on a Durham specification and may be of use to the Town of Durham and enhance negotiations.
 - d. Durham and Madbury both contract with McGregor Ambulance Service for the EMS transport needs, therefore the transition should be seamless.
 - e. Durham's Town Manager and Durham's Fire Chief displayed interest in having these required discussions.
 - f. The one school in Madbury is in the same SAU as the Durham schools enhancing a seamless transition for public education and school safety planning.

Should negotiations not be fruitful the team recommends negotiating with the city of Dover.

Once an agreement is reached the Town should transfer all Fire and Life Safety inspections to the Town's Building Inspector.

If during the negotiations it becomes apparent that the current Madbury Fire Station is not needed, then the Town should consider appointing a committee to discuss the short-term use of the fire station should fire protection be contracted out.

XI. PROJECT TEAM

Project Manager

Perry E. Plummer has had an award-winning public safety and emergency management career spanning over 35 years and serving three NH Governors. He has a proven track record of success as a senior executive, a crisis manager and a transformational leader serving at the local and state level.

After joining Dover Fire and Rescue in 1986 he quickly progressed through the ranks before becoming Chief in 2002. Over the next ten years, Chief Plummer transformed the entire department into a customer service juggernaut. During his tenure as Chief, he successfully consolidated the City's building, plumbing, electrical, and health departments as well as the city's fire prevention program under the fire department, saving thousands of dollars each year. Additionally, Plummer possesses a wealth of entrepreneurial skills.

Between 2012 and 2019, Perry served as New Hampshire's Director of Homeland Security and Emergency Management. During this time, he oversaw the preparation, exercise, response, and mitigation of terrorist threats, incidents, and natural and anthropogenic disasters. Furthermore, he coordinated all state agencies' planning, response, and recovery during terrorist attacks, natural disasters, and large-scale threats to public safety including cyber incidents. As Director, Perry co-managed the statewide fusion center and lead the effort to develop the state's first Cyber Integration Center as well as developing and exercising the State's cyber response plan. Expertly managing 18 federally declared disasters, he was also active at the national and international level.

As the Assistant Commissioner for the NH Department of Safety, Mr. Plummer managed 1,700 employees to effectively coordinate seven divisions, including State Police, Homeland Security and Emergency Management, State Fire Academy and Bureau of Emergency Medical Services, Emergency Services (911) Division, Division of Administration, and Division of Motor Vehicles. Perry developed and led a nationally recognized school safety program and has been called a school safety expert.

In December 2020 Plummer was personally asked to return to state service by New Hampshire Governor Christopher Sununu to lead New Hampshire's Covid-19 Vaccine Response. In spite of the COVID vaccine effort being the largest and most challenging public health response in the state's history, New Hampshire lead the nation by providing an example of best practice.

With his diverse educational background, Plummer has achieved unprecedented success. He holds numerous fire service certifications and has attended a number of prestigious educational programs, including the Executive Leadership Program from the Naval Postgraduate School. He

has also lectured on Interest Based Bargaining in graduate programs at Boston University and Southern New Hampshire University. Mr. Plummer is an MRI Senior Public Safety Consultant.

Director of Fire Services

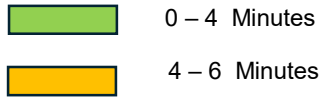
Brian P. Duggan, Director Fire Services Group, retired from the Fire Department in Northampton, Massachusetts, where he instituted substantial changes to modernize and restructure the entire department including equipment, facilities, personnel, and training. In conjunction with his staff, Brian integrated Emergency Medical Services (EMS) into the organization and created a regional Advanced Life Support (ALS) Program that currently serves 18 communities within the Northampton Area. He formerly commanded the Northborough, Massachusetts, Fire Department, and has significant experience with the Massachusetts Department of Fire Services where over three decades, he held several key positions. Following his retirement, Brian has continued his active fire service involvement by serving as both a volunteer chief fire officer and through continuing to develop training and certification programs as a program Coordinator for the Massachusetts Department of Fire Services.

Mr. Duggan developed and directed the Graduate and Undergraduate Fire Science Programs at Anna Maria College in Paxton Massachusetts from 1995 - 2003. Mr. Duggan has a Business Management/Fire Science degree from Providence College and a Master's Degree of Business Administration (MBA) from Nichols College in Dudley, Massachusetts. He is also a graduate of the National Fire Academy Executive Fire Officer Program and the Senior Executive Program for State and Local Leaders at Harvard University. In December 2012, Mr. Duggan received a Master's Degree in Homeland Security through the Naval Post Graduate School based in Monterey, California, where his thesis entitled "*Enhancing Decision-making during the First Operational Period of Surge Events*" was selected as an outstanding thesis. He was one of the first fire service professionals to be designated as a Chief Fire Officer by the Commission on Fire Accreditation International.

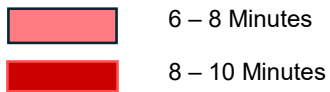
Brian led the Massachusetts fire service through his affiliation as Chairman of the Fire Chief Association of Massachusetts Technology Committee and as a Regional Director on the Massachusetts State Fire Mobilization Committee. Mr. Duggan has authored several publications, inclusive of writing Section 7, Chapter 3, Fire Department Information Systems, in the Nineteenth and Twentieth Editions of the National Fire Protection Association's Fire Protection Handbook. Chief Duggan has been affiliated with MRI as a subject matter advisor since 2002 and he has served as Director of Fire Services since 2015. Currently, Mr. Duggan is regarded as an expert specific to fire service response to photovoltaic and battery energy storage system (BESS) emergencies. He has developed several nationwide training programs providing first responders with new insight on these emerging challenges.

MADBURY RESPONSE TIMES

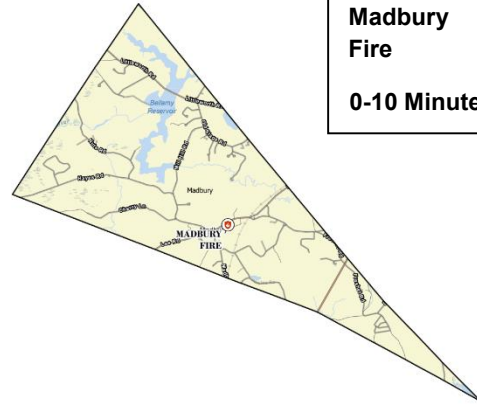
Response Times (NFPA 1710)



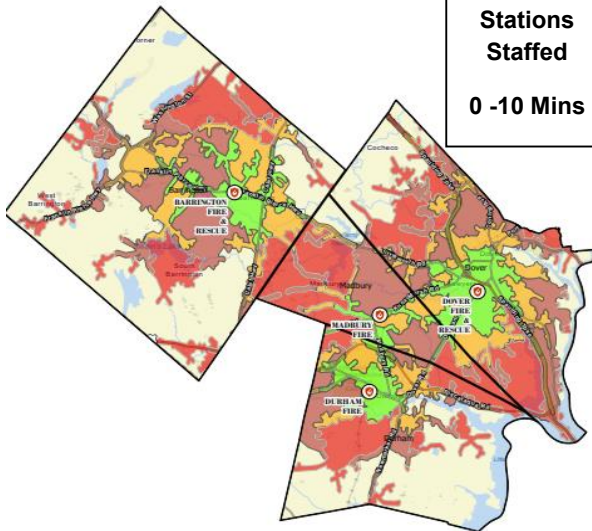
Response Times (NFPA 1720)



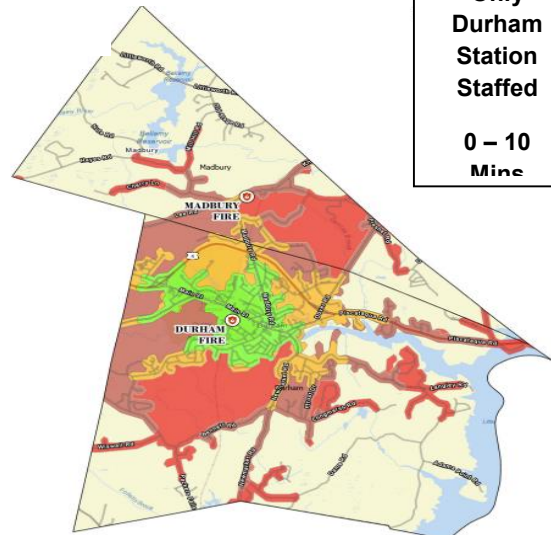
**Madbury
Fire**
0-10 Minutes



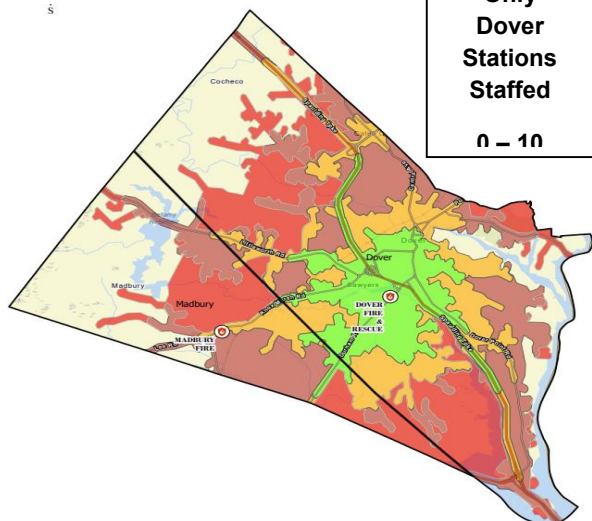
**All Four
Stations
Staffed**
0 -10 Mins



**Only
Durham
Station
Staffed**
0 – 10
Mins



**Only
Dover
Stations
Staffed**
0 – 10



**Only
Barrington
Station
Staffed**
0 – 10 Mins

