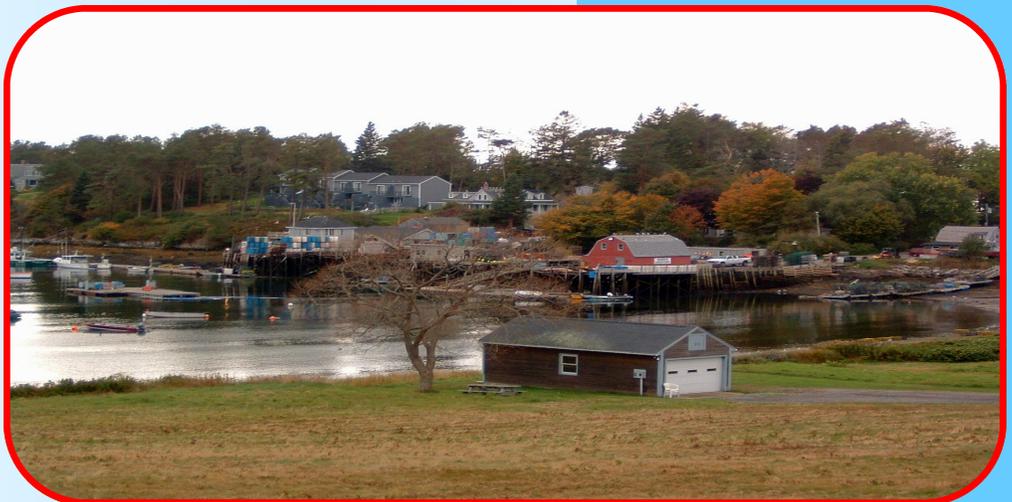


*Town of*  
**Harpswell**

**Fire and Rescue Services Study**



**February 2008**

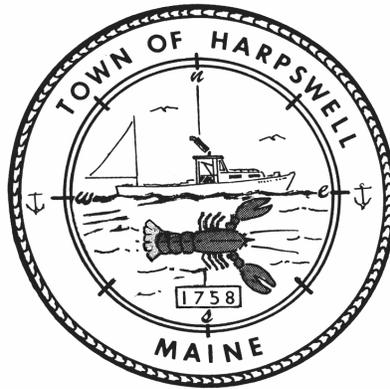


*Emergency Services Consulting inc.*

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**Town of Harpswell, Maine**  
**Fire and Rescue Services Study**



**FINAL REPORT**

**February 2008**



**Prepared By:**  
**Phil Kouwe**  
**Kent Greene**  
**Robert McNally**

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## Executive Summary

This multiple fire department evaluation and capital improvement plan study is offered by Emergency Services Consulting inc. (ESCi) in response to a request by the Town of Harpswell, Maine. The purpose of this study was to review and analyze current deployment of fire department resources within the Town of Harpswell (Town) and to assess future needs specific to emergency services resource deployment, staffing, operational policies and capital improvement needs of the three fire departments.

ESCi would like to thank Town staff and elected officials as well as the volunteer officers and members of Cundy's Harbor Volunteer Fire Department, Harpswell Neck Fire and Rescue, and Orr's and Bailey Islands Fire Department for their excellent cooperation in the preparation of this report. All involved were candid in their comments and provided an enormous amount of information in a short period of time.

Each report section provides the reader with general information about that element, as well as specific observations and analysis of any significant issues or conditions. Observations are supported by data collected during the information gathering process, thorough analysis of the collected data, and from the collective emergency services experience of the ESCi consultants. Finally, specific findings and conclusions are included to resolve identified issues and to take advantage of any opportunities that may exist.

### **Current Service Delivery Analysis**

This section includes a detailed resource deployment review and an analysis of the current demand on the operations of the three fire departments serving the Town. Ancillary support systems within the departments have been reviewed as well to understand, in totality, the system in place for emergency incidents.

The criteria used to evaluate the departments have been developed over many years. These criteria include relevant guidelines from national accreditation criteria, the National Fire Protection Association, federal and state mandates for emergency medical services (EMS) systems, recommendations by various medical communities (American Medical Association, Fellow of the American College of Emergency Physicians, and the American Heart Association), and generally accepted practices within the fire and EMS industry.

**Community Risk and Future Service Demand Projections**

This section develops a community risk analysis necessary for the creation of future deployment strategies. It does so by examining current and future risk factors for the Town, which includes population projections as well as socioeconomic and demographic compositions. Included is a review of the existing water supply systems for fire suppression. A detailed analysis of department capabilities provides an estimate of the approximate amount of water available throughout the Town, based on pre-designated water supply points and department apparatus and personnel capabilities.

All factors translate into a community risk assessment of Town-wide variables that affect current and projected impacts on service demand. This information was utilized to determine if the current system capacity could handle current and anticipated workload.

**Capital Needs Assessment and Improvement Plan**

ESCi evaluated the current apparatus of the three Harpswell fire departments to determine availability and condition of existing apparatus. Once this evaluation was complete, ESCi conducted a needs analysis based on service demand and geographical concerns. Based on information provided from the analysis, combined with the preliminary capital improvement plan developed by the individual departments, ESCi constructed an apparatus capital improvement plan as detailed in the table below.

**Figure 1: Apparatus Improvement Plan**

<b>UNIT</b>	<b>MODEL YEAR</b>	<b>REPLACEMENT COST</b>	<b>CURRENT AGE</b>	<b>LIFE EXPECTANCY</b>	<b>REPLACEMENT YEAR</b>
OBI Tanker 1	1985	\$ 210,000	23	20	2005
OBI EMS 1	1995	\$ 115,000	13	10	2005
HN Tanker 2	1986	\$ 210,000	22	20	2006
HN Engine 2	1990	\$ 250,000	18	18	2008
OBI Engine 1	1991	\$ 250,000	17	18	2009
CH EMS 1	1999	\$ 115,000	9	10	2009
CH Tanker 1	1991	\$ 210,000	17	20	2011
HN EMS 1	2004	\$ 115,000	4	10	2014
CH Engine 1	1997	\$ 250,000	11	18	2015
OBI Engine 3	2000	\$ 250,000	8	18	2018
CH Squad 1	2003	\$ 140,000	5	15	2018
OBI EMS 1	2008	\$ 115,000	N/A	10	2018
HN Utility 1	2007	\$ 40,000	1	12	2019
CH EMS 1	2009	\$ 115,000	N/A	10	2019
OBI Utility 2	2004	\$ 275,000	4	15	2019
OBI Engine 2	2008	\$ 140,000	N/A	15	2023
HN EMS 1	2014	\$ 115,000	N/A	10	2024
HN Engine 1	2006	\$ 250,000	2	18	2024
HN Tanker 1	2004	\$ 210,000	4	20	2024
OBI EMS 1	2018	\$ 115,000	N/A	10	2028
CH EMS 1	2019	\$ 115,000	N/A	10	2029
HN EMS 1	2024	\$ 115,000	N/A	10	2034
<b>TOTALS</b>		<b>\$ 3,720,000</b>			

In ESCi’s evaluation of the departments serving the Town, we have determined that, overall; the system’s performance is not unlike most other volunteer fire departments in the region. Current station placement is adequate for current service demand. Town personnel, elected officials, and interested community citizens recognize the need for periodic outside assessment and evaluation and have actively sought that assistance. Finally, the system is stable in its administration, and Town and fire department officials are actively looking for ways to enhance the service provided. The list below serves as a summary of recommendations found throughout this report. The list is segregated into priorities as defined by each priority heading.

**PRIORITY ONE - Immediate Internal Life Safety**

No recommendations of this type were found during the study

**PRIORITY TWO - Legal or Financial Exposure**

- ESCi recommends that service contracts between the Town and the volunteer fire departments be prepared. ESCi believes the contract should include, at a minimum, a set of performance standards and an obligation to operate within all laws and regulations. ....13
- The Town should purchase equipment through a competitive bid process. ....95

- Cundy’s Harbor Volunteer Fire Department should establish a written disciplinary policy.124
- All departments should adopt *NFPA 1582* and implement a system of initial physical testing prior to active suppression activities, as well as periodic physical and respiratory evaluations. 127
- All departments should train firefighters in hazardous materials to the operations level as outlined by OSHA 1910.120.....135
- To ensure financial integrity and maintain public confidence, each department should periodically submit to a complete external audit, performed in accordance with GASB standards for those agencies receiving federal awards funding.....146

**PRIORITY THREE - Corrects a Service Delivery or Management Issue**

- Develop a program to replace vehicles through the recommended capital improvement plan funded by the Town. ....88
- The Town should enter into an agreement with the fire departments to purchase capital vehicles that meet the Town’s needs. ....95
- The Town should develop consistency among the departments in regards to the types of vehicles purchased and the equipment to be included in the vehicle purchase, considering individual department needs. ....95
- Form a Community Emergency Response Team to supplement the local fire departments during times of disaster.....110

**PRIORITY FOUR - Enhances the Delivery of Service or Department Management**

- The fire departments should complete accurate calculations of their normal tanker shuttle capability, using tested load and offload times and true capacity (based on weight testing). Maps can be generated using established water points in the Town, color-coded to demonstrate GPM flow capability.....69
- The Town of Harpswell should continually recognize the criticality of GPM flow and the proximity of water points as it considers new development or redevelopment areas. The Town is in the best position to require installation of adequate and plentiful water points through land use regulations and permit processes.....69
- Develop specifications for new apparatus based on specific Town needs and condition of community streets and access ways. ....88

- Based on the travel time of Brunswick Fire Department, the Town should consider entering into an inter-local government agreement for Brunswick to provide *first-due* service to the extreme northern sections of the Town. ....99
- Establish a volunteer retention, recruitment program region-wide using, for example, concepts found in the appendix on *Staffing Needs and Volunteer Sustainability*. ....127

**PRIORITY FIVE - Represents Industry Best Practice (A Good Thing To Do)**

- Begin purchasing apparatus through a collaborative effort and competitive bid process. ...88
- The Town should maintain ownership of all vehicles purchased with public funds. ....95
- The Town should appoint a capital replacement committee consisting of fire department representatives, as well as elected officials for balance. ....95
- The vehicle committee should determine specifications for all vehicle purchases. ....95
- Approval of specifications should rest with the Town Selectmen. ....95
- Although each department has proud traditions related to their various benefit and compensation programs, some standardization between the three departments may be advisable so that each geographical area offers similar opportunities for volunteer recruitment and retention incentives. The desired outcome is to ensure that any lack of compensation or benefits in one department, when compared to another, does not become a disincentive for members or potential members. ....124
- Develop a standard disciplinary process utilized and followed by all three departments serving the Town. ....124
- If the Town, at some point, determines the need to implement an EAP, such services should be offered to the volunteer fire departments as well. ....125
- Standardize volunteer qualifications, requirements, and application process for participation in service delivery for all Harpswell fire departments. ....127
- All Harpswell fire departments should consider establishing a formal annual physical abilities evaluation and skill competency demonstration for emergency response personnel. .128
- The fire departments should provide all personnel with some form of simple, basic performance evaluations at least annually. ....128
- A joint safety committee should be implemented with representation from each of the three departments. ....129
- Consider providing various training opportunities beyond the basic skill sets that could include officer development, specialized skill training, fire investigation, public education, etc.,

- based on the current needs of the community. Such opportunities often provide motivation for newer members seeking to expand their skill set. ....135
- Implement the use of proficiencies and competency standards, and test firefighters and EMS personnel annually to that established standard. ....135
  - Continue to enhance cooperative training efforts so that all three departments can utilize and share lesson plans and training schedules across jurisdictions. ....136

The success of adopting and implementing change and improvement depends on many things. In ESCi’s experience with hundreds of department evaluations, leadership is the single factor that most frequently determines success. Nearly always, a key staff, councilor, or board member champions the concept, garnering the support of the various affected groups (political, member, and community). In addition, good leadership fosters an organizational culture receptive to planning, calculated risk taking, and flexibility. The manner in which leaders promote a trusting relationship between all groups and aid two-way communication between the groups is essential.

The ESCi project team began collecting information concerning the Town’s emergency services system in October 2007. The compilation of information and the preparation of this report have required many hours on everyone’s part to complete. The team members recognize the report contains a large quantity of information and ESCi would again like to thank the volunteers and staff of the fire departments and town government for their tireless efforts in bringing this project to fruition. We sincerely hope that the information contained in this report is utilized to its fullest extent, and that the emergency services provided to the citizens of Harpswell are improved by its implementation.

## Analysis of Current Service Delivery

This section evaluates current responsibilities, chain of command, organizational structure, budget and funding, and current service delivery infrastructure. The section also evaluates personnel and staffing levels and analyzes existing standards of response coverage and staff distribution. Additionally, Emergency Services Consulting inc. (ESCi) evaluated current capital assets, including facilities and vehicles, as well as completing an analysis of current deployment strategies and performance.

### Organization Overview

#### *Cundy's Harbor Volunteer Fire Department*

The Cundy's Harbor Volunteer Fire Department, Inc. (CHVFD) operates under a traditional agreement with the Town of Harpswell (Town) and provides fire protection and basic life support (BLS) emergency medical transport services to the community. The department's jurisdiction encompasses a portion of the governmental boundaries of the community. The response area includes scenic Great Island, along coastal Cumberland County in Maine. The department began providing services in 1952.

CHVFD provides emergency services to a year-round population of 1,790<sup>1</sup> in an area of roughly 14 square miles. The area served by the department is experiencing light growth. The department's services are provided from one facility located within the jurisdiction. The department maintains a fleet of vehicles including one fire engine, one tanker, one ambulance, and one utility/service truck.

There are 26 individuals<sup>2</sup> involved in delivering these services to the jurisdiction. The department's primary management team includes a fire chief, rescue chief, two assistant chiefs, and three captains. A board of directors, including a president, secretary, and treasurer provide additional support services. Primary staffing coverage for emergency response is through the use of on-call responders coming from home or work. For immediate response, around six

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<sup>1</sup> U.S. Census Bureau, 2000 census data, non-seasonal resident population only.

<sup>2</sup> Current number at time of field research.

personnel are typically available in the daytime (14 at night), carrying pagers to receive radio calls for emergency response.

The department provides a variety of services, including fire suppression, emergency medical response and transport, ice and still-water rescue, vehicle extrication, and operations-level hazardous materials response.

The CHVFD is a private, member-governed corporation, formed under the laws of the State of Maine. It operates as a not-for-profit 501(c)3 that is chartered for the purpose of providing emergency service to the community and qualifies to enter agreements with the governmental jurisdiction to provide said services on its behalf. The original Articles of Incorporation were filed on May 23<sup>rd</sup>, 1947. The corporation's official agent and registered office were last updated on June 3<sup>rd</sup>, 2002 and annual corporate reports have been filed with the Secretary of State, as required, for the last five years.

The private, member-governed corporation operates under a board-chief form of governance. Department by-laws state that the fire chief and rescue chief are appointed positions, with the fire chief appointed by the board of directors with no specified term, and the rescue chief appointed by the fire chief with approval of the board. The common practice, however, is that both positions are appointed by the board. The officers of the corporation consist of the president, vice president, secretary, treasurer, fire chief, and rescue chief. Aside from the two chiefs, the corporation officers serve one-year terms and are elected by the membership at the annual business meeting.

***Harpswell Neck Fire and Rescue***

The Harpswell Neck Fire and Rescue, Inc., (HNFR) operates under a written agreement with the Town and provides fire protection and basic life support emergency medical transport services to the community. The department's jurisdiction encompasses a portion of the governmental boundaries of the community. The response area includes suburban residential neighborhoods and estates along miles of shoreline and is situated on the Harpswell Neck peninsula area of Cumberland County. The department began providing services in 1937, formed by community-minded citizens concerned over fire safety in the community.

HNFR provides emergency services to a year-round population of 1,730<sup>3</sup> in an area of roughly ten square miles. The area served by the department is experiencing light to moderate growth. The department's services are provided from one facility located within the jurisdiction. The department maintains a fleet of vehicles including two fire engines, two tankers, one ambulance, and one utility/wildland vehicle. In addition, one 1939 Federal antique pumper vehicle is available in reserve, no longer used for front-line service.

There are 33 individuals<sup>4</sup> involved in delivering these services to the jurisdiction. The department's primary management team includes a chief, assistant chief, rescue chief, two fire captains, one rescue captain, and three lieutenants. A board of directors and part-time bookkeeper provide additional support services. Primary staffing coverage for emergency response is through the use of on-call responders coming from home or work. For immediate response, between two and 12 personnel are typically available and carry pagers to receive radio calls for emergency response.

The department provides a variety of services, including fire suppression, emergency medical response and transport, still-water rescue, and operations-level hazardous materials response.

The HNFR is a private, member-governed corporation, formed under the laws of the State of Maine. It operates as a not-for-profit 501(c)3 that is chartered for the purpose of providing emergency service to the community and qualifies to enter agreements with the governmental jurisdiction to provide said services on its behalf. The original Articles of Incorporation were filed on February 7<sup>th</sup>, 1940, when it was called the Harpswell Neck Fire Department Association. The name of the organization was officially changed to its current name in 1998. An associated corporation, the Harpswell Neck Volunteer Ambulance Service, Inc. merged with the fire department on October 13<sup>th</sup>, 1993. The corporation's official agent and registered office were last updated on July 9<sup>th</sup>, 2002 and annual corporate reports have been filed with the Secretary of State, as required, for the last five years.

The private, member-governed corporation operates under a board-chief form of governance. The fire chief is an elected officer position with a one-year term. The board is composed of elected members, including three firefighters, three emergency medical service personnel, and

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<sup>3</sup> U.S. Census Bureau, 2000 census data, non-seasonal resident population only.

<sup>4</sup> Current number at time of field research.

between three and seven members from the general public. The corporation officers are elected from within the board itself and consist of the president, vice president, secretary, and treasurer. In addition, the fire chief, rescue chief, and president of the auxiliary serve as ex officio board members. Aside from the two chiefs, the corporation officers serve staggered three-year terms and are elected by the membership at the annual business meeting.

### ***Orr's and Bailey Islands Fire Department***

The Orr's and Bailey Islands Fire Department (OBIFD) operates under a traditional agreement with the Town and provides fire protection and BLS emergency medical transport services to the community. The department's jurisdiction encompasses a portion of the governmental boundaries of the community. The response area includes rural neighborhoods and small coastal village areas of Cumberland County and is situated along the rocky coastline of narrow Orr's Island and Bailey Island as well as a portion of the southwest side of Great Island. The department began providing services in 1984 as a result of a merger of two separate fire departments, Orr's Island Fire Department and Bailey Islands Fire Department.

OBIFD provides emergency services to a population of 1,525<sup>5</sup> in an area of roughly ten square miles. The area served by the department is experiencing light to moderate growth. The department's services are provided from two facilities located within the jurisdiction. The department maintains a fleet of vehicles including two fire engines, one tanker, one ambulance, one wildland firefighting vehicle, and a utility/rescue unit.

There are 31 individuals<sup>6</sup> involved in delivering these services to the jurisdiction. The department's primary management team includes a fire chief, rescue captain, assistant chief, and three fire captains. A board of directors and a compliance officer provide additional support services. Primary staffing coverage for emergency response is through the use of on-call responders coming from home or work. For immediate response, between eight and 10 personnel are typically available and carry pagers to receive radio calls for emergency response.

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<sup>5</sup> U.S. Census Bureau, 2000 census data, non-seasonal resident population only.

<sup>6</sup> Current number at time of field research.

The department provides a variety of services, including fire suppression, emergency medical response and transport, vehicle extrication, awareness-level hazardous materials, as well as ice and still-water rescue.

The OBIFD is a private, member-governed corporation, formed under the laws of the State of Maine. It operates as a not-for-profit 501(c)3 that is chartered for the purpose of providing emergency service to the community and qualifies to enter agreements with the governmental jurisdiction to provide said services on its behalf. The original Articles of Incorporation were filed on December 18<sup>th</sup>, 1986. The corporation's official agent and registered office were last updated on April 3<sup>rd</sup>, 2006 and annual corporate reports have been filed with the Secretary of State, as required, for the last five years.

The private, member-governed corporation operates under a board-chief form of governance. The fire chief is appointed by the board of directors annually with no limit to the number of terms he/she may serve. The board of directors is composed of two ex officio members, the fire chief and rescue captain, and not less than 11, nor more than 17, elected members. Aside from the fire chief and rescue captain, the board is elected to three-year terms.

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It was noted that the fire chiefs for all three departments are appointed by the Town selectmen to provide the chiefs with statutory authority and protections afforded under Maine law.

Currently, there are no written service agreement between the Town and Cundy's Harbor and Orr's and Bailey Islands volunteer fire departments. The written agreement with Harpswell Neck Fire & Rescue is a very basic agreement pertaining primarily to a loan agreement for a truck purchase. This needs to be corrected as soon as practical. There are several reasons the written agreement is important.

First, within the policies of the Insurance Services Office (ISO) related to their Public Protection Classification program is a requirement for a legal contract or resolution. The ISO has stated "...if a community does not have a fire department operated solely by or for the governing body of that community, the fire department providing such service must do so under legal contract or

resolution.”<sup>7</sup> Even though the community has been provided a rating in the past, this does not mean that evidence of a written contractual agreement will not be required by ISO in the future.

Another reason for the written agreement is the specification of any risk or civil liability involved in providing the service on behalf of the governmental entity. The written agreement may be necessary to ensure proper application of any tort limits for the Town, and is also important when risk is transferred to an insurance carrier. The written agreement should specify the distribution, sharing, or transfer of liability risks between the Town and the service provider, in this case the volunteer fire departments.

Finally, it is important that the Town provide the fire departments with any specifications for service delivery or performance in exchange for governmental funding. Without a written agreement, the Town is providing financing to the agencies with no guarantee in return that service will be delivered to any specific level of performance or even in accordance with industry best practices. The Town should retain the ability to hold the fire departments accountable for service delivery.

Imagine a governmental unit contracting with an asphalt paving contractor in the amount of \$100,000 to simply *pave roads* with no specifications as to how many miles of road would be paved, when they would be paved, to what quality they would be paved, or whether the contractor would even operate legally. Elected officials entering into such a contract would be the subject of sharp criticism for not ensuring accountability and efficiency. The contract that passes fire protection authority to a private entity should be no less accountable or specific than any other private contract for government services.

The need for the governmental authority to produce a set of reasonable performance expectations for its emergency services cannot be overemphasized. Minus a well-defined target, there is no means by which good service can be adequately defined. Likewise, current service cannot be adequately defended. Once produced, these performance targets can become an integrated part of the service delivery contracts to establish the benchmark against which the services will be measured.

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<sup>7</sup> *Minimum Facilities and Practices to Get a PPC Rating*; ISO Properties, Inc. 2007.

**Recommendation:**

- ESCi recommends that service contracts between the Town and the volunteer fire departments be prepared. ESCi believes the contract should include, at a minimum, a set of performance standards and an obligation to operate within all laws and regulations.

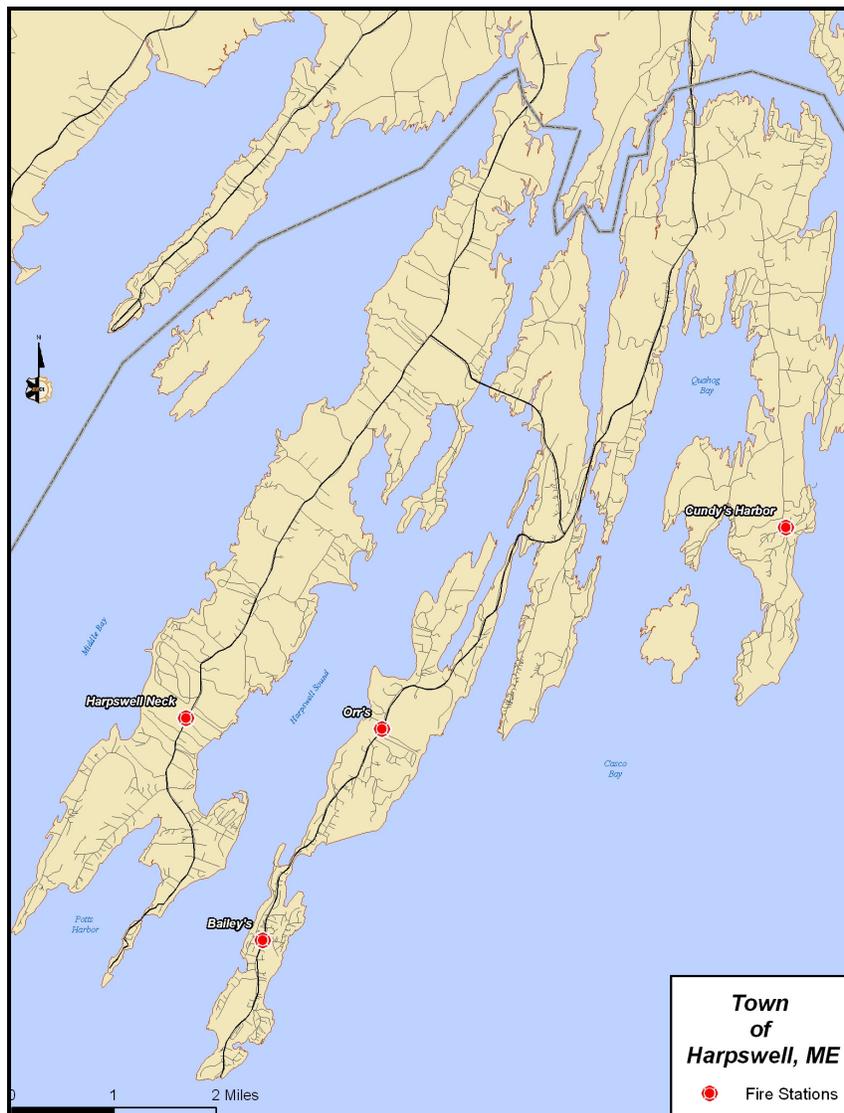
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## Emergency Response and Service Delivery

### Distribution Analysis

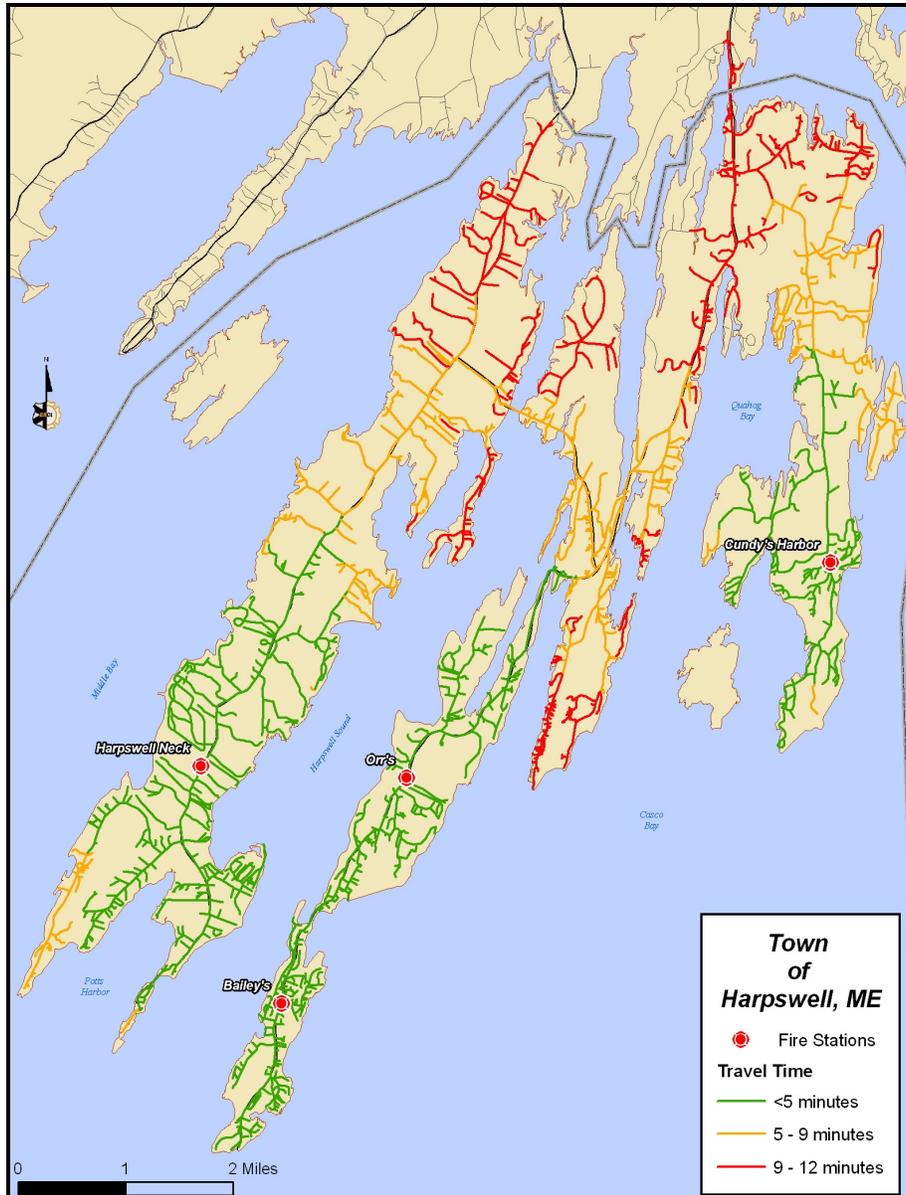
Fire protection and emergency medical services within the Town of Harpswell are provided by three organizations. Collectively, these fire departments operate out of four facilities located near the ends of the three main peninsulas and islands of the Town. The service coverage area includes all the peninsulas and island areas of Harpswell which lies south of the city of Brunswick along the Atlantic coast and encompasses 23.68 square miles. The following map depicts the locations of the fire stations within the town.

Figure 2: Harpswell Fire Station Deployment



The following map demonstrates those areas within a five, nine, and 12-minute travel time from the stations within the Town. The time is calculated by modeling travel time on the actual roadway network. Speed reduction has been utilized to account for turning apparatus and intersections. These are travel time estimates and do not include turnout time of the responders.

Figure 3: Current Travel Time Capability from a Fire Station



Virtually the entire town can be reached by a first arriving apparatus within a 12-minute travel time according to the model, while much of the Town is accessible within five minutes of

apparatus travel. Some of the most northern areas can be accessed by the apparatus from the Brunswick Fire Department in a shorter timeframe as illustrated in the following figure.

Figure 4: Brunswick Fire Department Travel Time Capability



### Insurance Credentialing Criteria

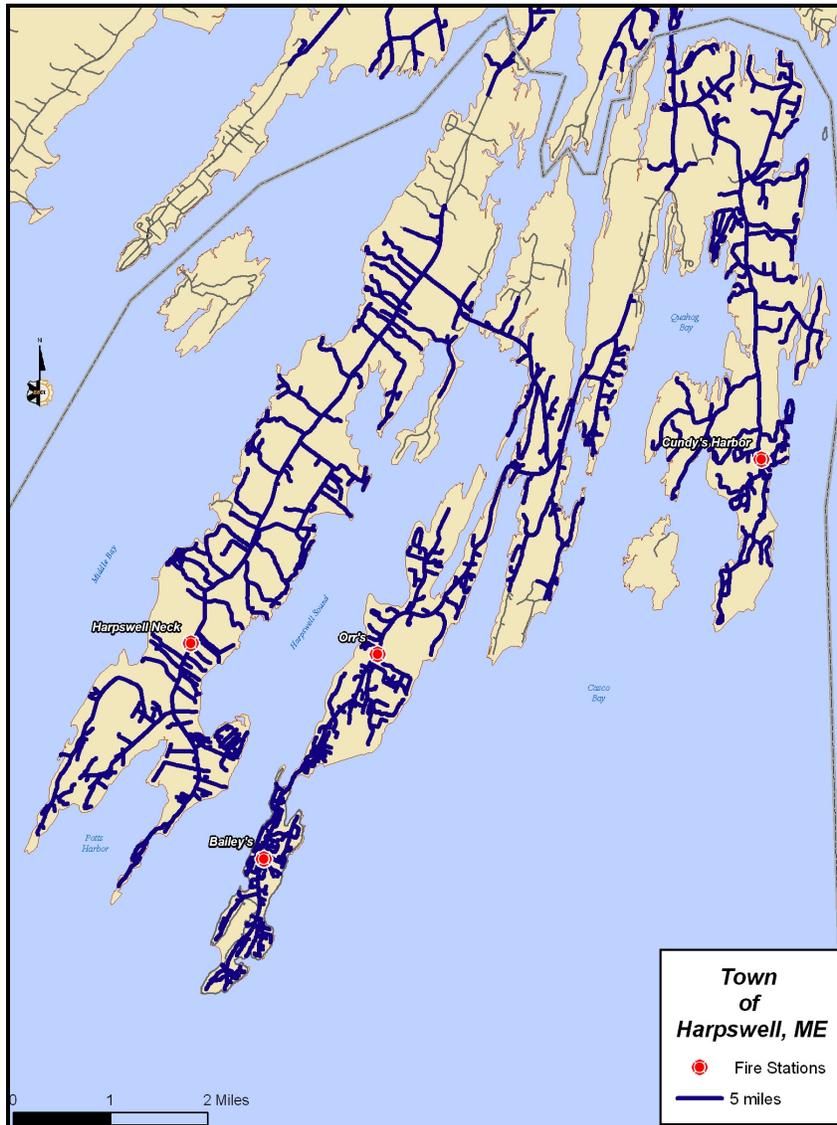
The next map examines the coverage based upon credentialing criteria for the Insurance Services Office. The ISO evaluates fire protection in communities nationwide and is influential in the rate determination that insurers charge business and residential customers. While it is not to

suggest that facility deployment be dependent upon the ISO rated distance, it is an important factor to be considered by the community economically as lower insurance rates can attract growth.

In order to achieve optimum credit for the number of engine companies, ISO reviews the response area of each existing engine and identifies the number of fire hydrants within those response areas. ISO analyzes whether there are additional geographic areas of the district outside of the existing station response areas where at least 50 percent of the number of hydrants served by the largest existing response area could be served by a new engine. For ISO purposes, the response area is measured at 1.5 miles of travel distance from each engine company on existing roadways.

Since the Town of Harpswell does not have a public water supply which provides fire hydrants, the departments rely upon tanker trucks filled from wells or ponds. Therefore the 1.5 mile limit does not apply. The ISO rates properties beyond five miles from a fire station in a higher risk category. Therefore, the extent to which properties are beyond this distance is examined from stations in the Town, as well as the city of Brunswick.

Figure 5: ISO Distance Coverage



There are areas within the northern part of town which are beyond the five-mile limit for more favorable fire protection insurance ratings. A geographic analysis indicated that 254 buildings (exclusive of remote island properties) are outside of the recommended distance ranging from 125 to 7,278 square feet.

In similar fashion, to achieve optimum credit for the number of truck companies, ISO reviews the response area of each existing truck and identifies the number of fire hydrants within those response areas. ISO analyzes whether there are additional geographic areas of the district outside of the existing truck response areas where at least 50 percent of the number of hydrants

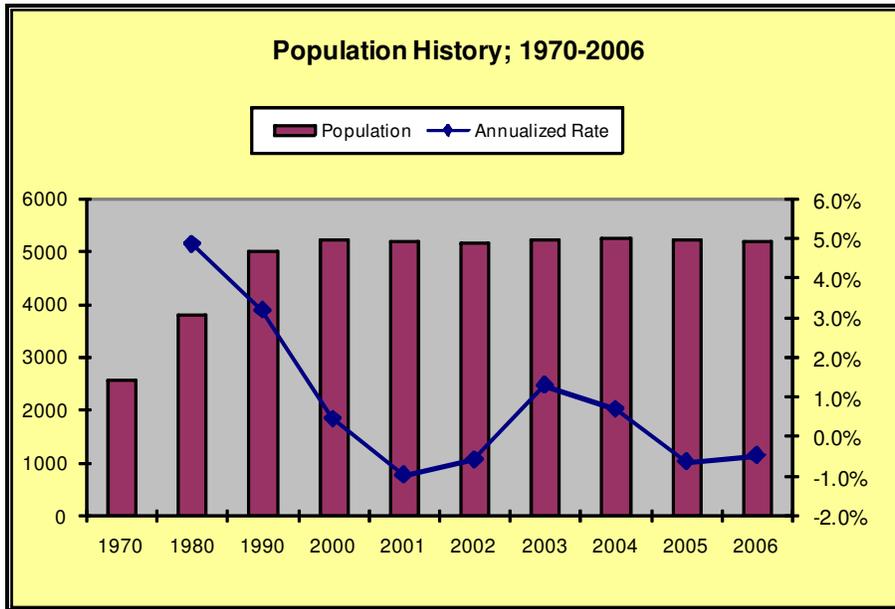
served by the largest existing response area could be served by a new truck were one to be added. For ISO purposes, the response area is measured at 2.5 miles of travel distance from each engine company on existing roadways.

None of the fire departments are equipped with an aerial apparatus. For the public protection classification, a truck company is not required to have an elevating ladder or aerial device unless there are a five or more buildings that are either three stories or greater, taller than 35 feet, or have a needed fire flow of greater than 3,500 gallons per minute. Other areas can receive credit for a truck company without the requirement of an elevated device and can even receive partial credit for a truck company if other apparatus, such as an engine, carries a complement of truck company equipment. While there may be one or more buildings fitting these criteria in Harpswell, ESCi could not find an indication that the Town would meet the requirements of an elevated ladder or aerial device. Currently, the Town has a building height limit of 30 feet that should ensure future structures do not create the need for an elevated aerial or ladder truck. Certain structures built before the rule may exceed 30 feet in height.

### **Current Population Information**

The estimated 2007 population for the Town is 5,852 persons according to the Maine State Planning Office. For the Town, population growth has been modest since 2000, but has risen slightly since the 1990 Census, when the population of Harpswell was 5,012. The following chart provides some historical information on population for the Town.

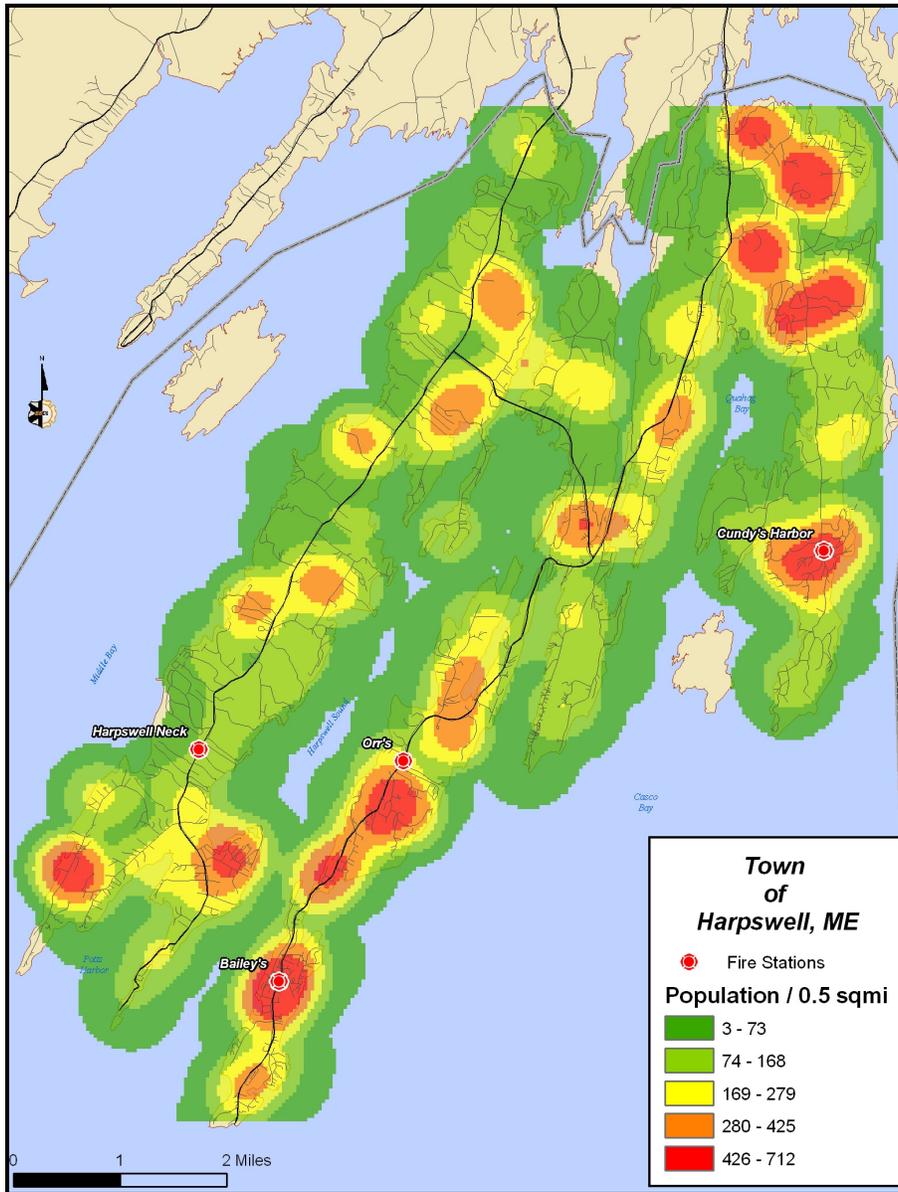
Figure 6: Harpswell Population Growth History



It is also useful to assess the distribution of the population within the Town, since there is a direct correlation between population density and service demand.

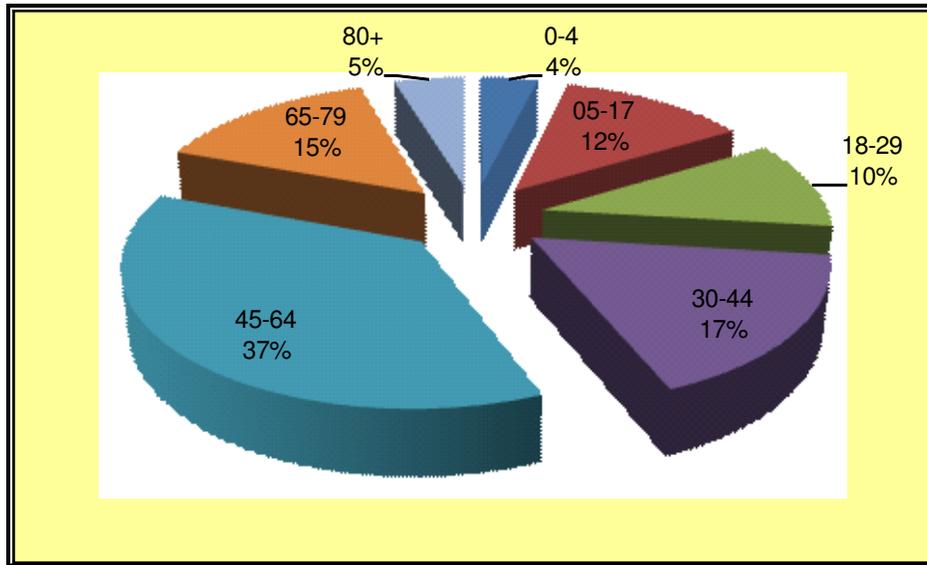
The following map displays Town population density, based on information from the 2000 U.S. Census Bureau.

Figure 7: Harpswell Population Density



The entire Town has a population density of less than 500 persons per square mile indicating a generally rural community character. Higher population concentrations are on the southern ends of the peninsulas, as well as in the Town's northeast area. As one factor that influences emergency service demand, population and its composition with regards to age and socioeconomic characteristics will need to be examined. The following chart examines the Town's population segmented by age groups.

Figure 8: Harpswell Population by Age



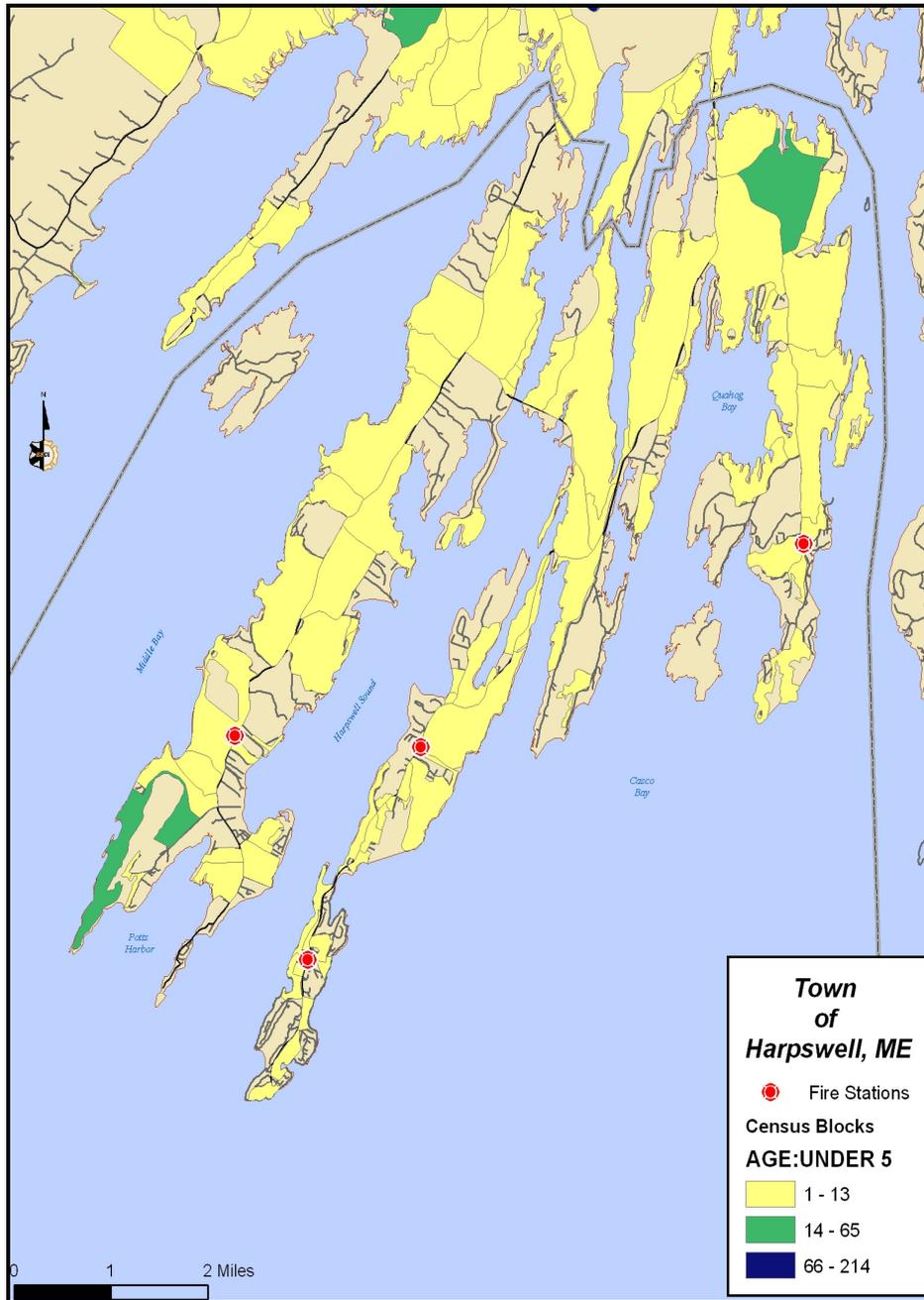
As seen in the figure, 20 percent of the population is 65 years of age or older and four percent of the population is under five years of age, placing a total of 24 percent of the area's population within the significant target age groups that pose the highest risk in residential fire incidents. Although the bulk of population is aged less than 65 years, the growth rate over the decade in the age 50 and older categories presents unique challenges to the fire service. As this group ages, they enter an age prone to medical incidents which can be expected to create a significant increase in service demand for emergency medical incidents, as the over age 65 cohort increases in percentage of overall population.

### **Demographic Risk Analysis**

Although there is always some probability for each citizen to require the use of medical services, age and socioeconomic factors play an important role in the frequency of use for emergency services.

It was previously stated that the very young are vulnerable in cases of fire conditions, as well as when faced with a serious medical ailments such as asthma. Traumatic events, such as choking or vehicular accidents, are also leading causes of mortality in this age cohort. Determining where the higher amounts of this population tend to live within the fire district will help in the deployment of apparatus, especially rescue units. The following illustrates the amounts of pediatric populations within the fire district area.

Figure 9: Pediatric Population



The concentration of pediatric-aged residents is highest in the extreme northeast and southwest areas.

In an effort to investigate the impact of the elderly population on emergency services, reviews of available academic literature yielded many related studies. The majority of this research can be found in medical journals. Several studies that focus on other facets of emergency services

such as hospitals and police services are reflective of the current strain on the use of emergency services. The high utilization rate of the emergency department by the elderly has been discussed and it has been found that the inadequacies in the access to primary care physicians by the elderly at home and in nursing homes is the cause of an inappropriate reliance on emergency rooms and the emergency transportation services (Wofford, Schwartz, and Byrum 1993)<sup>8</sup>. Clark and Fitzgerald (1999)<sup>9</sup> found that although the elderly comprise 12 percent of the population, they utilize approximately one-third of emergency ambulance use and two thirds of non-urgent use in their study area. Another study examined the demand on emergency departments and public emergency units when a patient, whose condition is beyond the resources of current medical science, is sent home to live their final days with the family. The study emphasized the need for the use of physician counseling of family members for 'expected' deaths at home so the patient does not needlessly end up in the hospital again (Grant 1993).<sup>10</sup>

Several studies have been conducted relating to the use of emergency services by the population at large. The British Health Department, in a response to an over-reliance on emergency services, proposed alternatives should be given to those patients or callers who summon emergency help for non-emergent situations (Beecham 1997).<sup>11</sup> In Milwaukee, as with many U.S. cities, ambulance diversion from overloaded hospitals has generated its own quest for solutions to a growing problem. Usually protective hospital systems are cooperatively providing bed-status data to the emergency service that is accessible and updated via the internet in an effort to reduce the strain on hospital services (Barthell et.al. 2003).<sup>12</sup> Cadigan and Burgarin (1989)<sup>13</sup> studied a larger population and found a correlation between the use of emergency services and age and income. The elderly and the poor are more likely to use

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<sup>8</sup> Wofford, James L., Earl Schwartz, and JE Byrum. 1993. "The Role of Emergency Services in Health Care for the Elderly: A Review" *Journal of Emergency Medicine*, 11(3): 317-26.

<sup>9</sup> Clark, MJ and G. Fitzgerald. 1999. "Older People's Use of Ambulance Services: A Population Based Study" *Journal of Accident & Emergency Medicine*, 16(2): 108-11.

<sup>10</sup> Grant, Dorothy. 1997. "MDs Must Help Eliminate 911 Calls After 'Expected' Home Deaths, medical Examiner Advises" *Canadian medical Association Journal*, 156(7): 1035-1038.

<sup>11</sup> Beecham, Linda. 1997. "Review Proposes More Emergency Care in the Community" *British medical Journal*, 314(7076): 251.

<sup>12</sup> Barthell, Edward, Seth Foldy, Kim Pemble, Christopher Felton, Ronald Greischar, William Pirrallo, and William Bazan. 2003. "Assuring Community Emergency Care Capacity with Collaborative Internet Tools: The Milwaukee Experience" *Journal of Public Health Management and Practice*, 9(1): 35-42.

<sup>13</sup> Cadigan, RT and CE Burgarin. 1989. "Predicting Demand in Emergency Ambulance Service" *Annals of Emergency Medicine*, 18(6): 618-21.

emergency services. Both Svenson (2000)<sup>14</sup> and Rucker et. al. (1997)<sup>15</sup> find elderly use of emergency services higher than the general population. Rucker et. al (1997) and Dickinson et. al. (1996)<sup>16</sup> correlated the type of insurance as a factor in emergency services use and time of day services used.

The *Baby-Boom* generation includes those individuals born between 1946 and 1964. In 2007, the oldest member was 61 years of age and the youngest was 43, this is the largest segment of the population in the United States. The growth of the elderly (65 years and older) is expected to increase dramatically over the next 30 years across the country. In Harpswell, 20 percent of the population was elderly.<sup>17</sup> As this cohort ages, medical conditions such as heart disease, cancer, neurological conditions, and cognitive maladies are likely to be present within this group.

Potentially, this will increase the call volume for emergency services significantly. In visualizing the current distribution of population within the district by age, census block data was utilized to determine the geographic risk by age group. This is displayed in the following figure.

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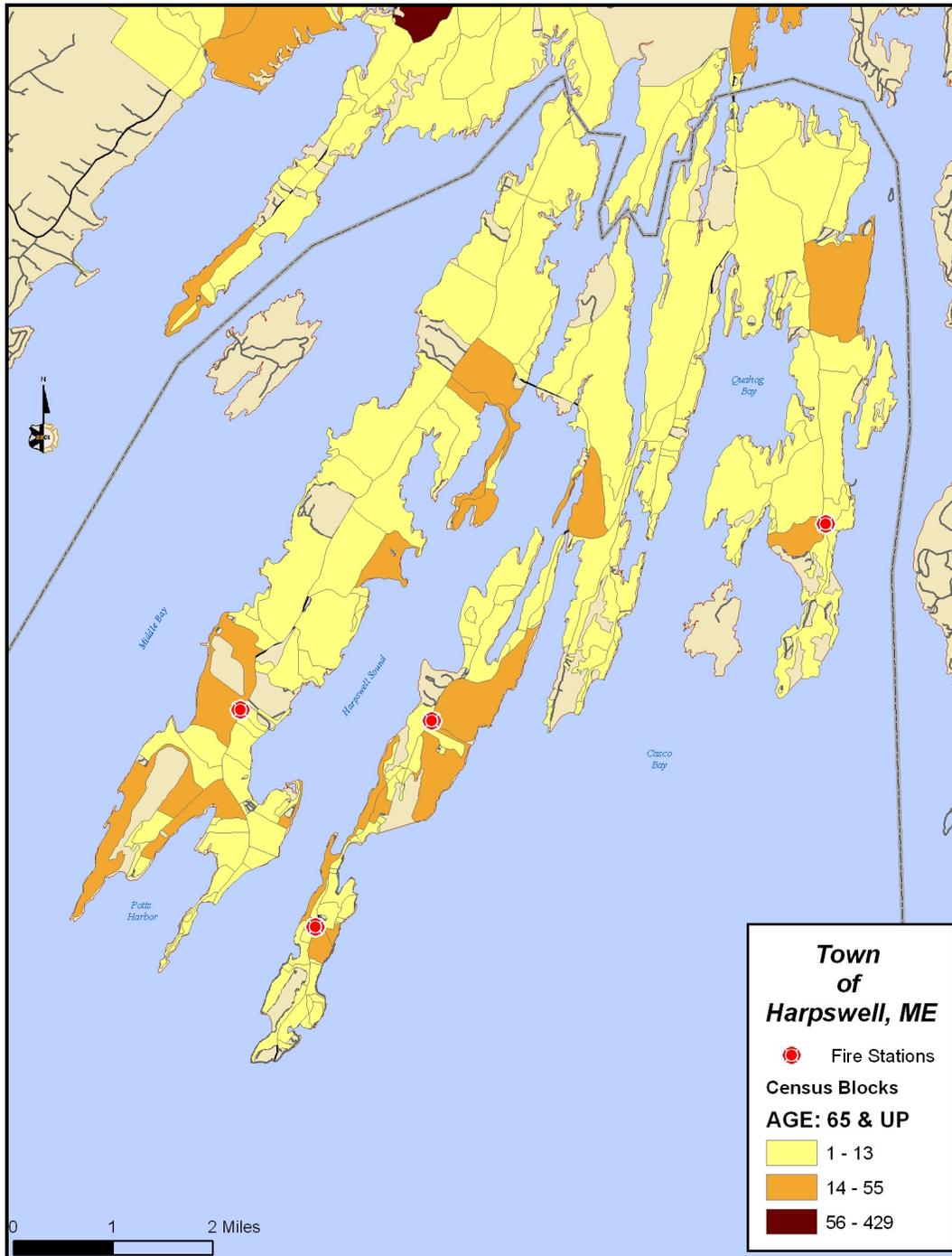
<sup>14</sup> Svenson, James E. 2000. "Patterns of Use of Emergency medical Transport: A Population-Based Study" *American Journal of Emergency Medicine*, 18(2): 130-4.

<sup>15</sup> Rucker, Donald, Roger Edwards, Helen Burstin, Anne O'Neil, and Troyen Breenan. 1997. "Patient – Specific Predictors of Ambulance Use" *Annals of Emergency Medicine*. 29(4): 484-491.

<sup>16</sup> Dickinson, Edward, Vincent Verdile, Christopher Kostyun, and Richard Salluzzo. 1996. "Geriatric Use of Emergency medical Services" *Annals of Emergency Medicine*, 27(2): 199-203.

<sup>17</sup> US Census Bureau.

Figure 10: Senior Population Density

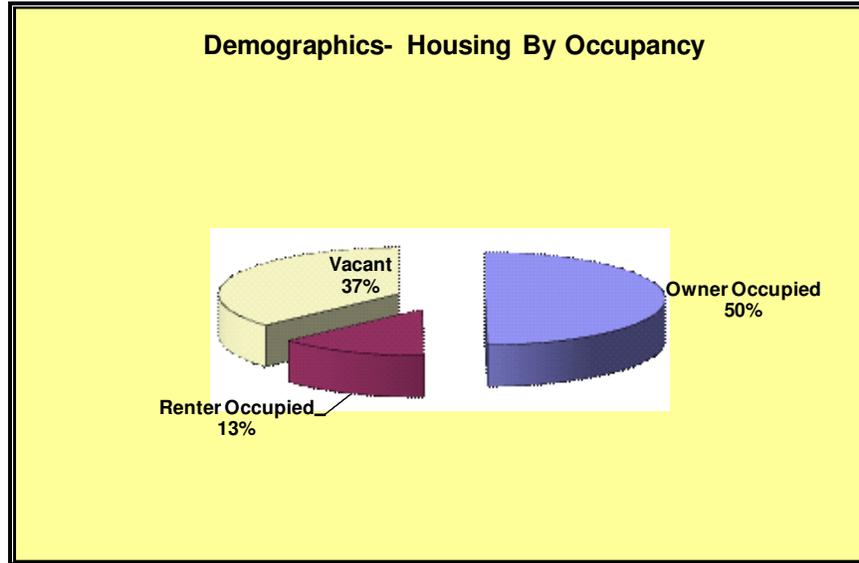


The higher amounts of older populations are along developed shoreline communities. This may translate into higher service demand for medical services from regionally located fire units.

**Current Housing Analysis**

This section examines the housing characteristics within the Town and its composition geographically. The following figure details the housing types for the year 2000.

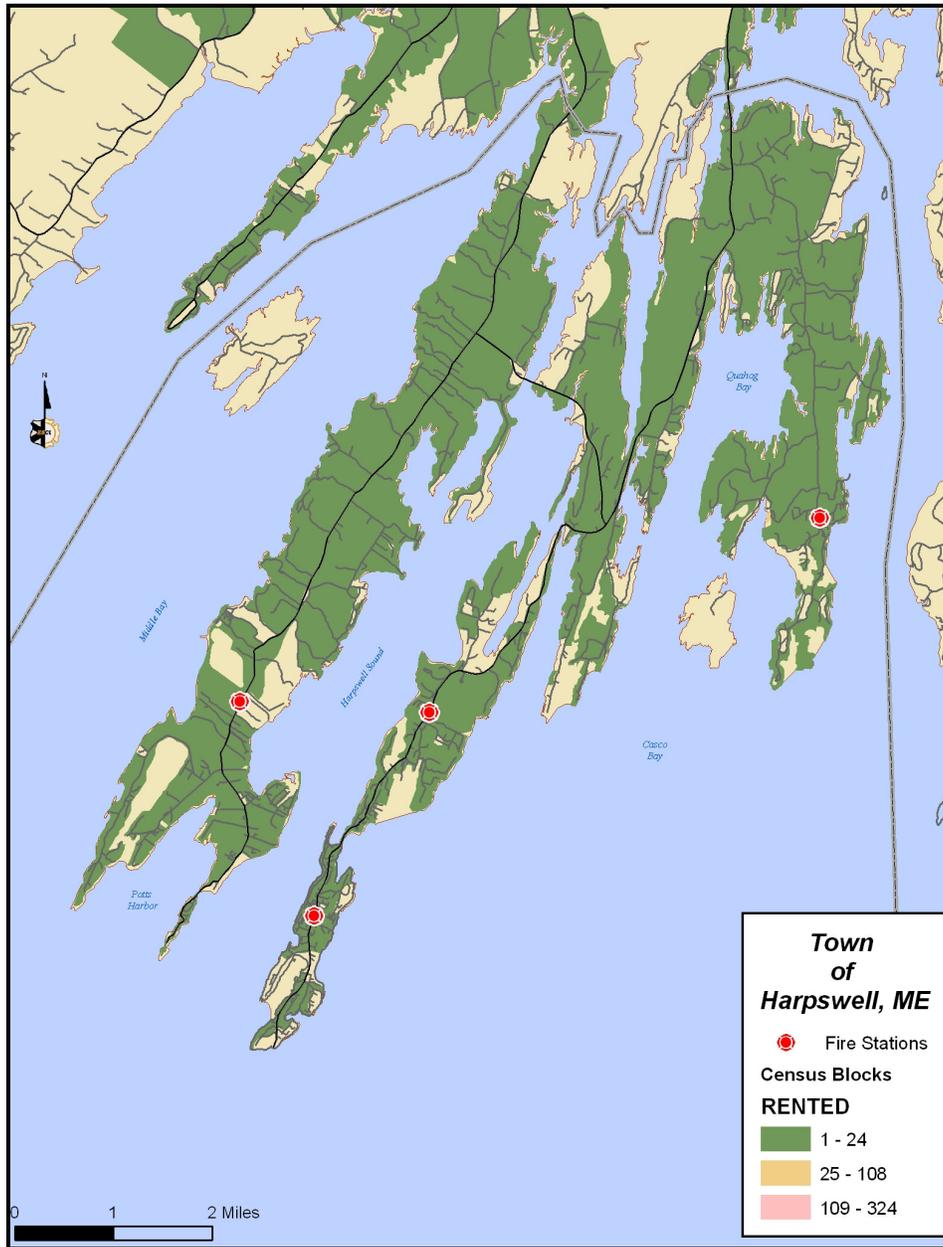
**Figure 11: Housing by Occupancy**



A high percentage of vacant property within a district is often cited as a reflection of negative economic conditions within an area. During such times, an increase in emergency incidents can be experienced. However, in vacation or resort areas, such as Harpswell, vacant housing is often a result of conditions not related to the region's economy and are, instead, a result of occupancies that are involved in seasonal use.

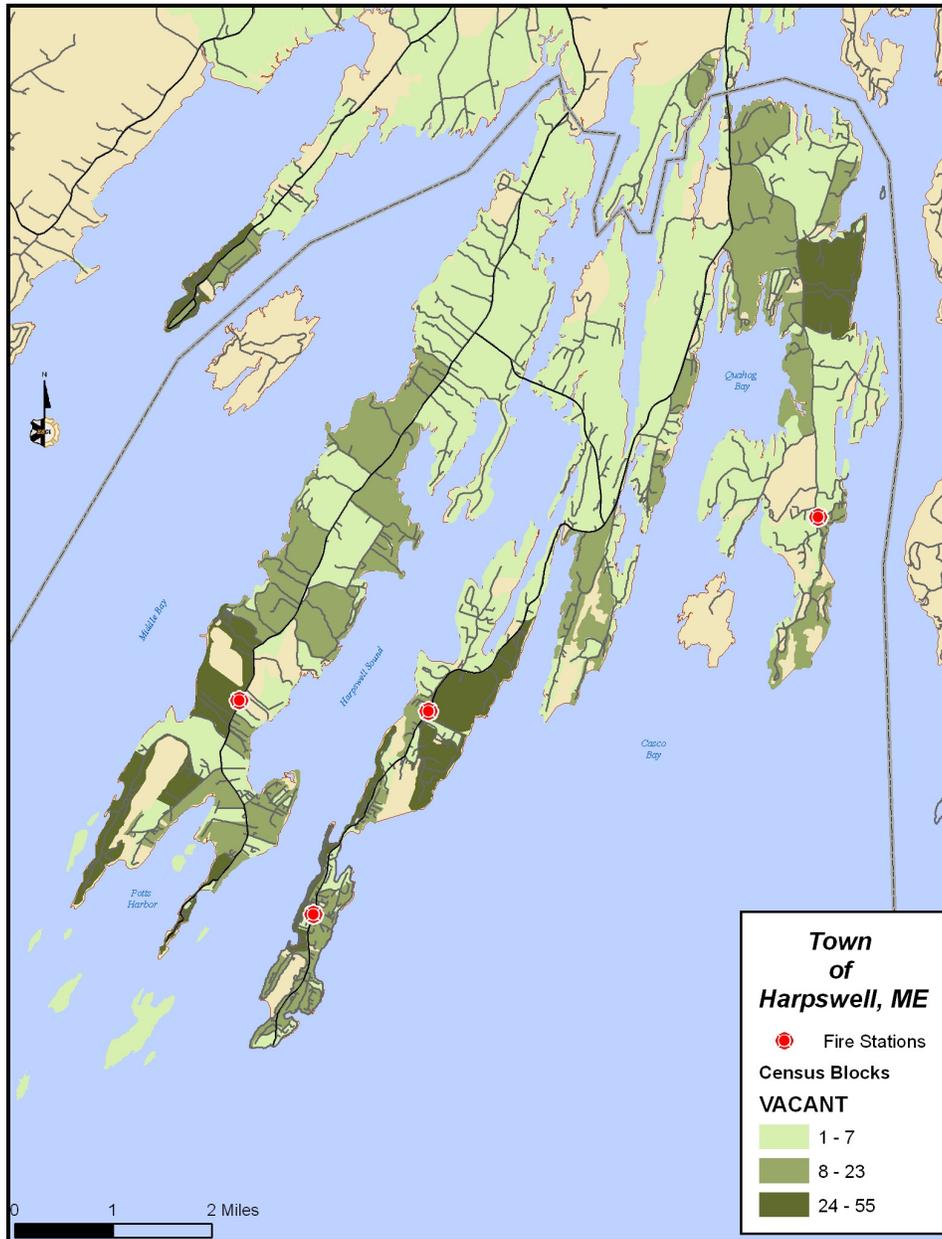
The following figure illustrates areas of concentrated rental housing by census block group for 2000.

Figure 12: Renter Occupancy Density



Year-round rental occupancy is relatively low and not concentrated in any one area. This is different than the area of higher concentrations of vacant properties along the shoreline as illustrated below.

Figure 13: Vacant Housing Density



The breakdown of occupancy indicates a high vacancy rate which typically reflects a negative socioeconomic indicator, but in the case of Harpswell, seasonal residents and vacationers account for an expected seasonal population which can range between 8,000 – 10, 000 total persons.<sup>18</sup> According to the U.S. Census Bureau, 89 percent of the vacant housing within Harpswell is for *occasional or seasonal use*.

<sup>18</sup> 2005 Town of Harpswell Comprehensive Plan, p. 95.

Using similar breakdown on occupancy capability for these units, estimated tourist occupancy is used to generate a seasonal population within the vacant units.

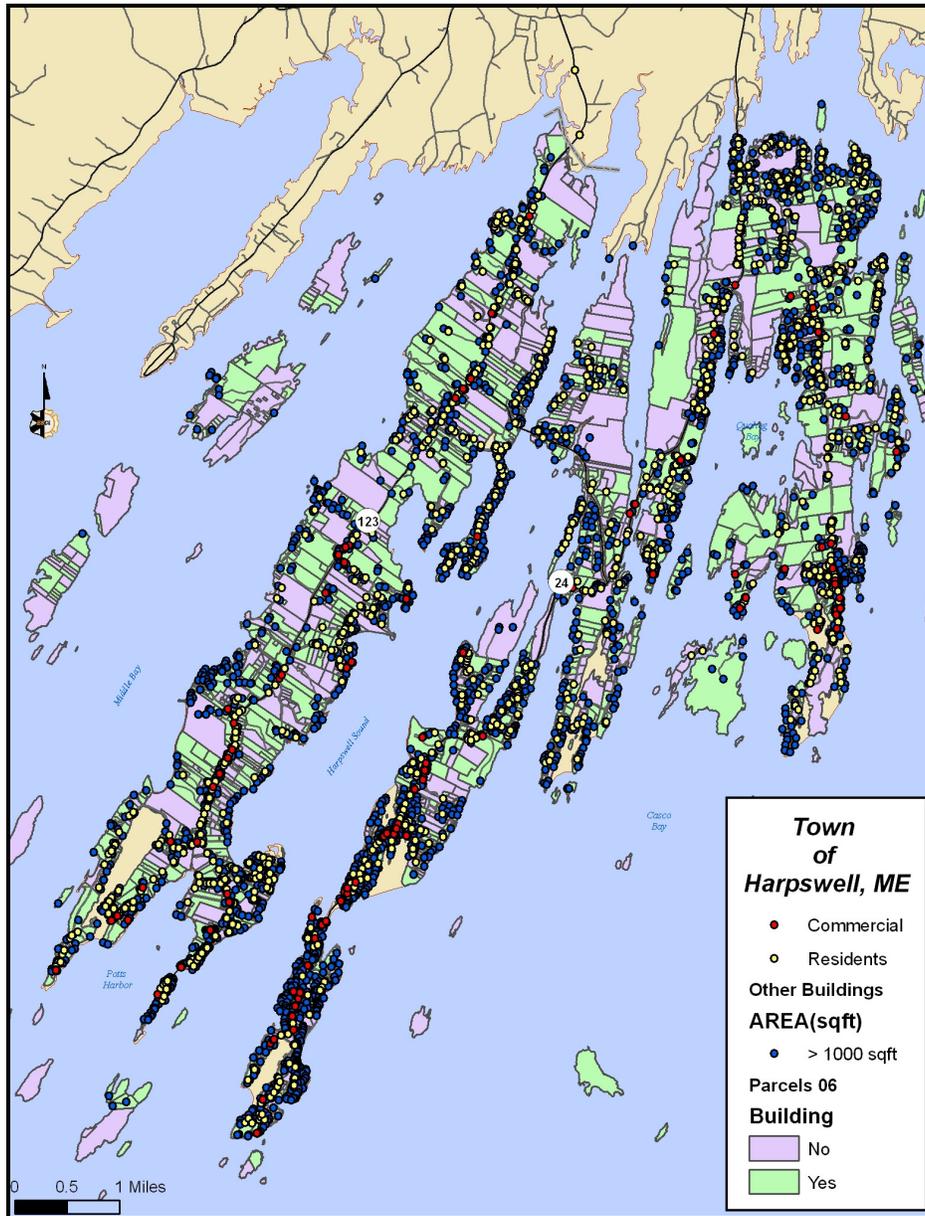
Figure 14: Vacant Housing Seasonal Population Estimates

Occupancy Capability	Units	Est. Persons Per Unit	Seasonal Population
No bedroom	38	2	75
1 bedroom	198	2	395
2 bedrooms	483	3.5	1,690
3 bedrooms	328	4.5	1,474
4 bedrooms	126	6.5	820
5 or more bedrooms	41	7.5	309
<b>Total</b>	1,214		4,763

While this estimates the population only within the vacant housing during season, there are nine bed & breakfast lodges, one seventy-lot campground, and four hotel/motels which have less than 30 units per facility. An exact population for these facilities, as well as the amount of day-trippers from the Brunswick and Portland areas cannot precisely be determined.

Another way to look at this issue is to examine the parcels which qualify for a homestead exemption (indicating they are resident-owned), which parcels are commercial in nature, and which may be void of suitable living quarters. The following map illustrates these parcels and properties by occupancy.

Figure 15: Property Occupancy



This additional population is expected to create an increase in service demand for the fire departments during the months of typical northern vacation cycles which occur from June through September.

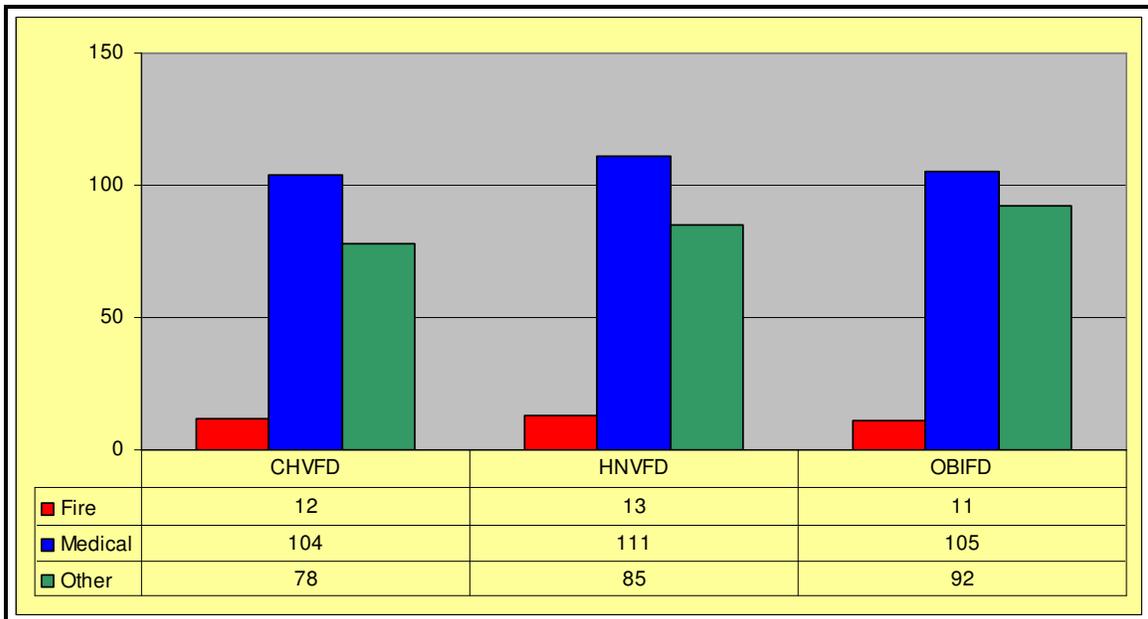
**Demand Analysis**

Each fire organization within the Town provided one year's worth of incident data from 9/30/06 through 9/30/07 from its fire reporting management system database. Each organization will be

analyzed separately with regards to its service demand period of peak activity and response time performance.

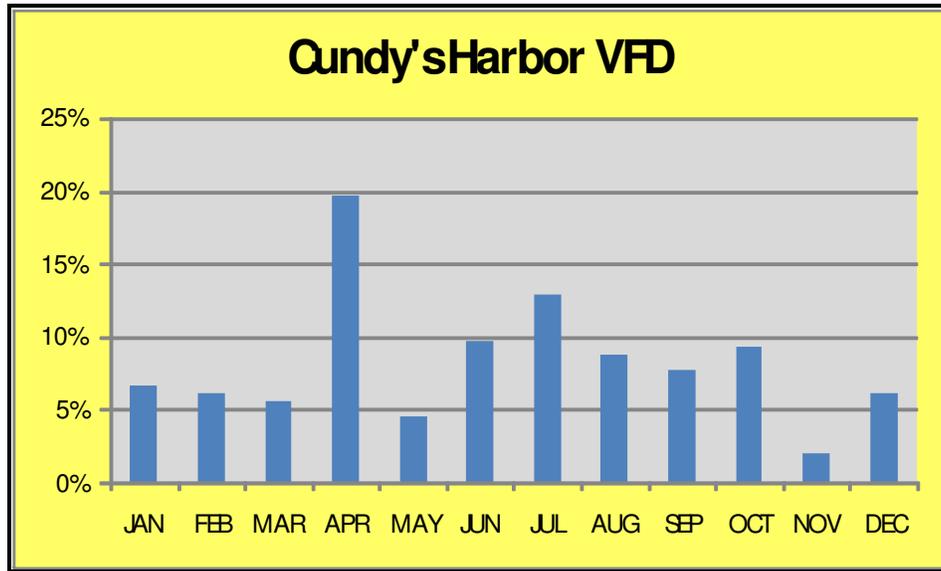
The following charts illustrate the change in volume and categories of incidents by major call type over the last year for each department. *Other* calls are those that were not actual fires or a medical request, such as a fire alarm. This information was obtained from computer aided dispatch (CAD) reports that record incidents singularly rather than separating EMS and fire calls when both divisions respond to the same incident, such as motor vehicle accidents to which both fire and ambulances respond.

**Figure 16: Workload Historical Data Summary**



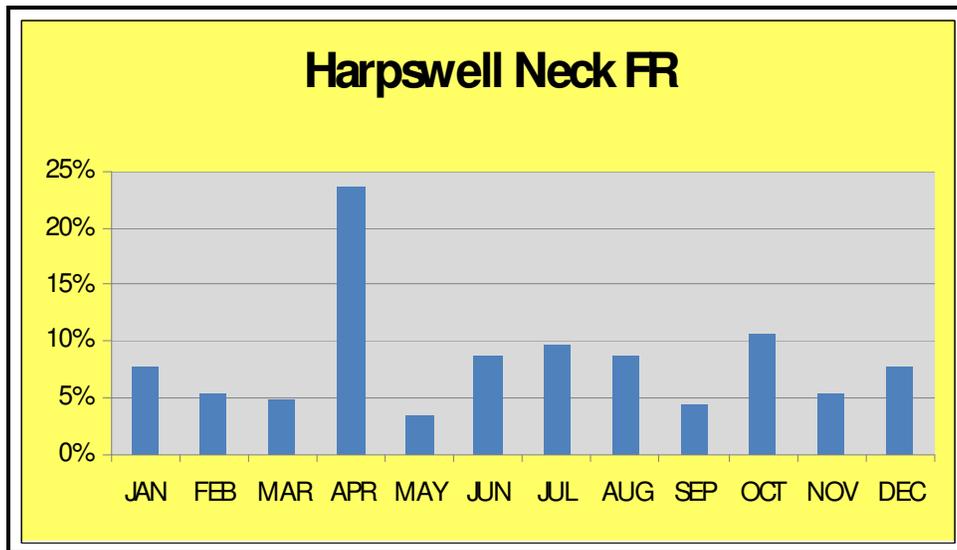
The bulk of the fire departments’ workload is handling requests for emergency medical aid. This is not unusual for fire departments who participate in either first responder or transporting capabilities. A review of incidents by time of occurrence reveals when the greatest response demand is occurring. The following charts show how activity and demand changes based on various measures of time. ESCi began by breaking down yearly workload into monthly increments.

Figure 17: CHVFD Monthly Workload



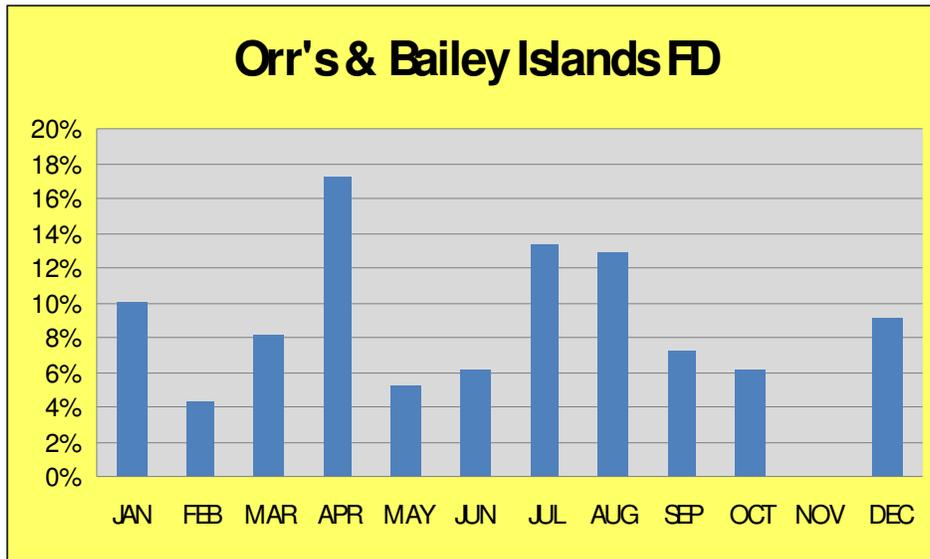
Monthly workload was significantly higher during April of 2007, due to the April 16 Patriot's Day storm, while generally higher call volume existed during the summer months and may be a reflection of higher tourist population.

Figure 18: HNFR Monthly Workload



April is again the highest month of activity. Monthly workload is higher during the summer months, but higher activity is noted as well during April and October. Again, the Patriot Day storm created the anomalous spike in call volume for April.

Figure 19: OBIFD Monthly Workload



Monthly workload was higher during April 2007, as noted above, but higher call volume increases at different times of the year such as March, July, and August.

In further analysis, workload is examined by day of the week. It appears that service demand is highest on differing days by department.

Figure 20: CHVFD Workload by Day of Week

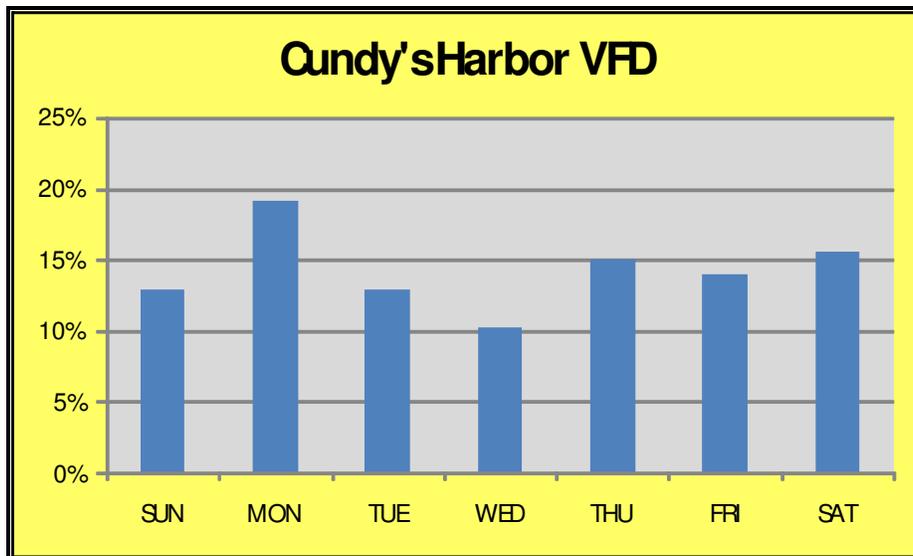


Figure 21: HNFR Workload by Day of Week

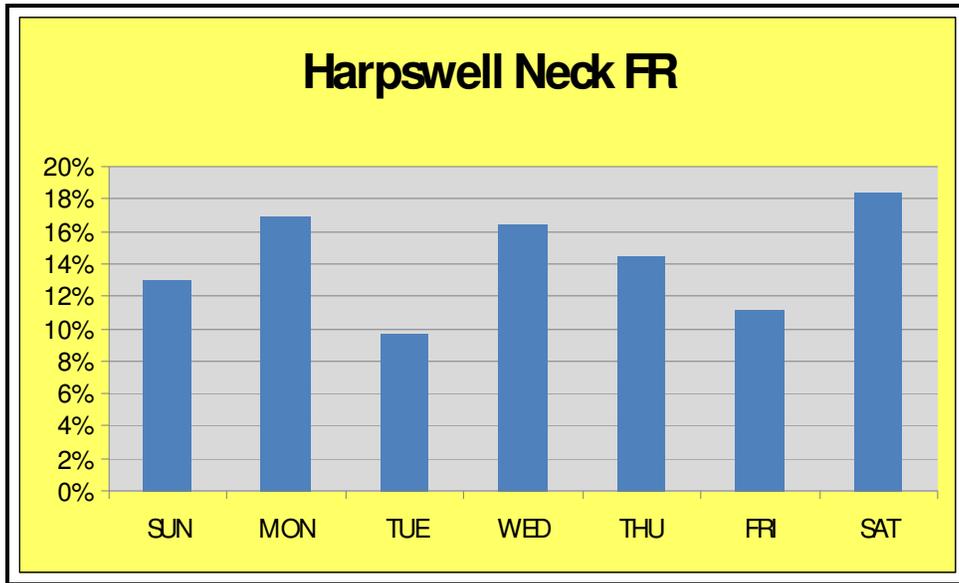
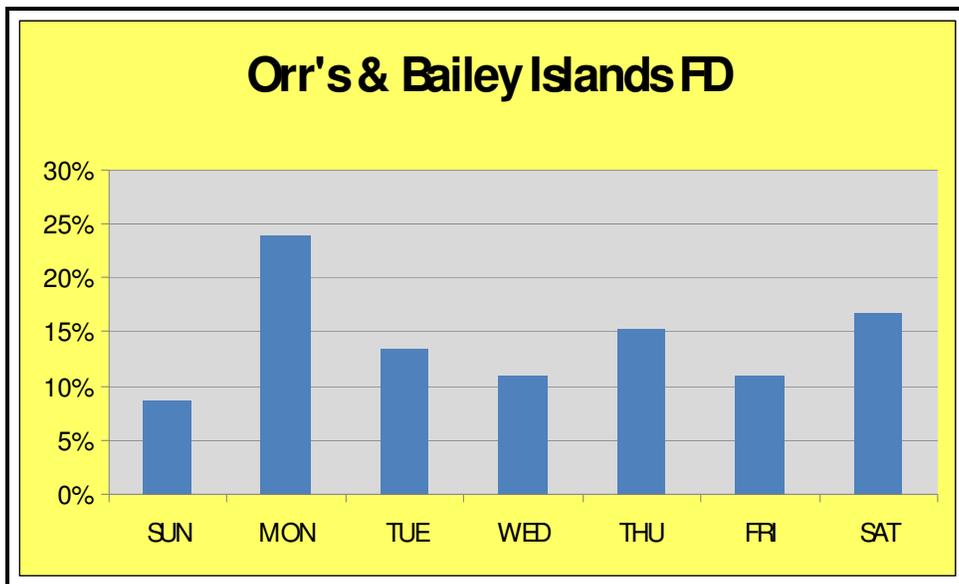


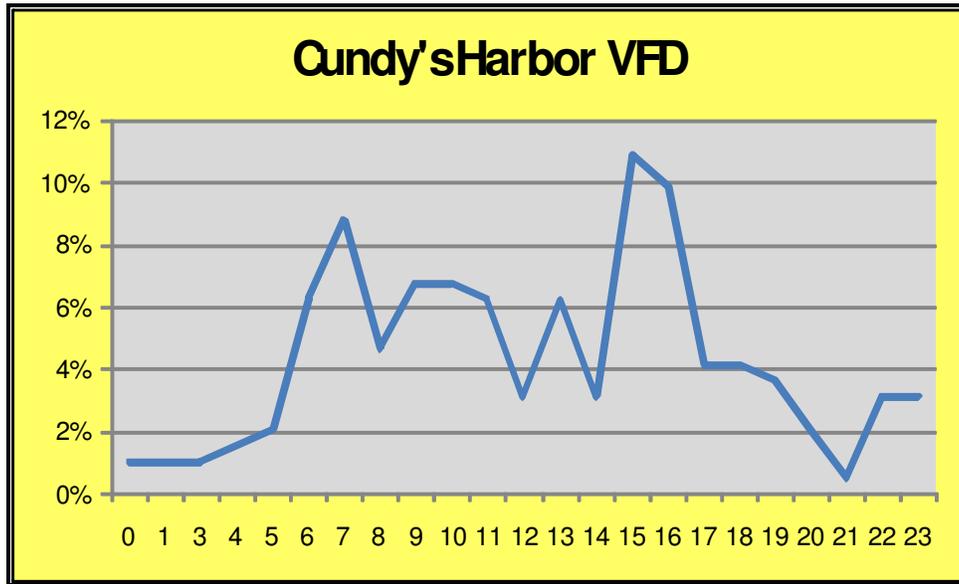
Figure 22: OBIFD Workload by Day of Week



The final analysis of historical workload concludes with examination of call types by hour of day. Peak activity hours can strain an under-equipped or under-staffed fire department. Understanding when peak activity occurs begins the process of developing deployment strategies and needs assessment.

Peak activity times can be reflected in response time performance in certain cases. The impact of response time on the outcome of emergency incidents has been exhaustively studied, both in the laboratory and in historical data, with predictable correlation between the two. Though seemingly intuitive, it is still useful to review how longer response times can have a negative effect on the ability to suppress fires, particularly in structures, or to successfully intervene in a life-threatening medical emergency. Response time performance is examined in a separate section.

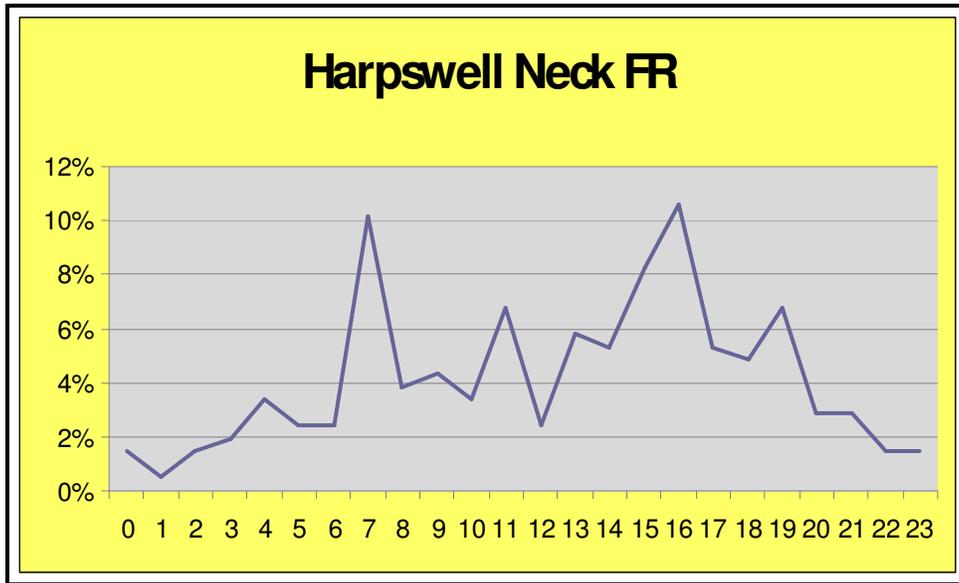
Figure 23: CHVFD Workload by Hour of Day<sup>19</sup>



Activity for calls begins to increase dramatically at 6:00 a.m. and vary widely throughout the day. It appears that peak volume occurs during the 3:00 p.m. hour before declining into the evening.

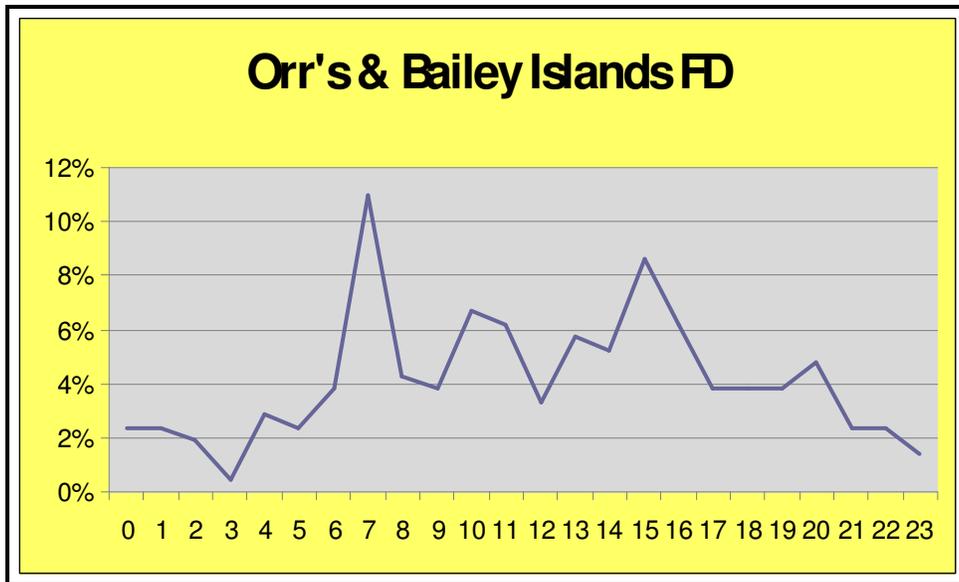
<sup>19</sup> No data at 2:00 a.m.

Figure 24: HNFR Workload by Hour of Day



Activity for calls begins to increase dramatically at 6:00 a.m., and peaks again later in the day at 4:00 p.m. after a varied workload during the daytime hours.

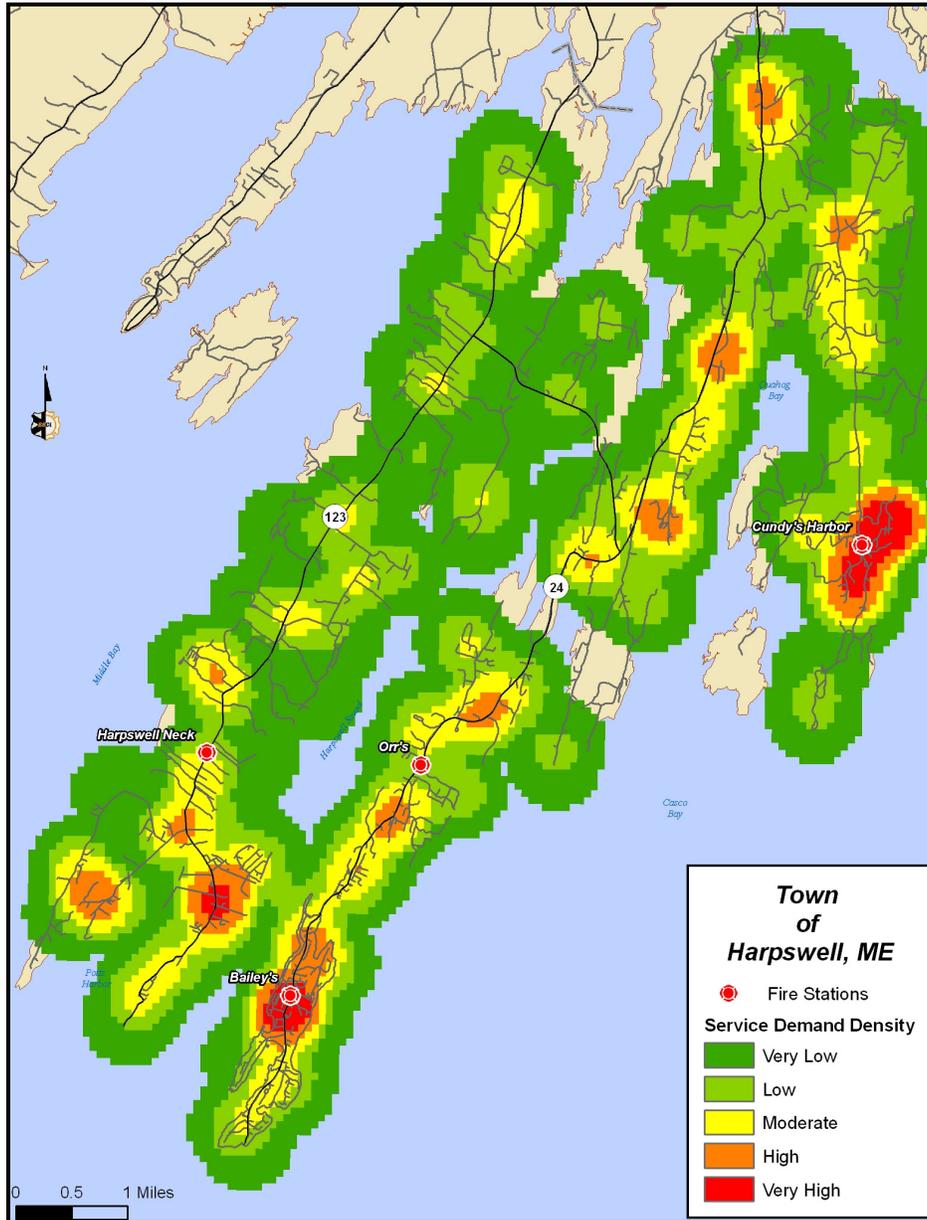
Figure 25: OBIFD Workload by Hour of Day



Activity for calls begins to increase at 4:00 a.m. and peak early in the day at 7:00 a.m. While generally lower for the rest of the day, secondary peaks of activity occur during the 10:00 a.m., 3:00 p.m., and 8:00 p.m. hours before declining into the evening.

In addition to the temporal analysis of the current service demand, it is useful to examine geographic distribution of service demand. The following maps indicate the distribution of emergency incidents responded to by the department.

Figure 26: Service Demand Density



The highest service demand correlates with areas of high residential population density. The most service demand is near the Bailey's Island and Cundy's Harbor stations.

### **Response Time Performance Objectives**

The ultimate goal of any emergency service delivery system is to provide sufficient resources (personnel, apparatus, and equipment) to the scene of an emergency in time to take effective action to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency situation to which the fire department responds.

Before discussing the department's current performance, it is important to gain an understanding of the dynamics of fire and medical emergencies.

### ***Dynamics of Fire in Buildings***

Most fires within buildings develop in a predictable fashion, unless influenced by highly flammable material. Ignition, or the beginning of a fire, starts the sequence of events. It may take some minutes or even hours from the time of ignition until flame is visible. This smoldering stage is very dangerous, especially during times when people are sleeping, since large amounts of highly toxic smoke may be generated during early phases.

Once flames do appear, the sequence continues rapidly. Combustible material adjacent to the flame heats and ignites which in turn heats and ignites other adjacent materials if sufficient oxygen is present. As the objects burn, heated gases accumulate at the ceiling of the room. Some of the gases are flammable and highly toxic.

The spread of the fire continues quickly. Soon the flammable gases at the ceiling reach ignition temperature. At that point, an event termed *flashover* takes place; the gases ignite, which in turn ignites everything in the room. Once flashover occurs, damage caused by the fire is significant and the environment within the room can no longer support human life.

Flashover usually happens about five to eight minutes from the appearance of flame in typically furnished and ventilated buildings. Since flashover has such a dramatic influence on the outcome of a fire event, the goal of any fire department is to apply water to a fire before flashover takes place.

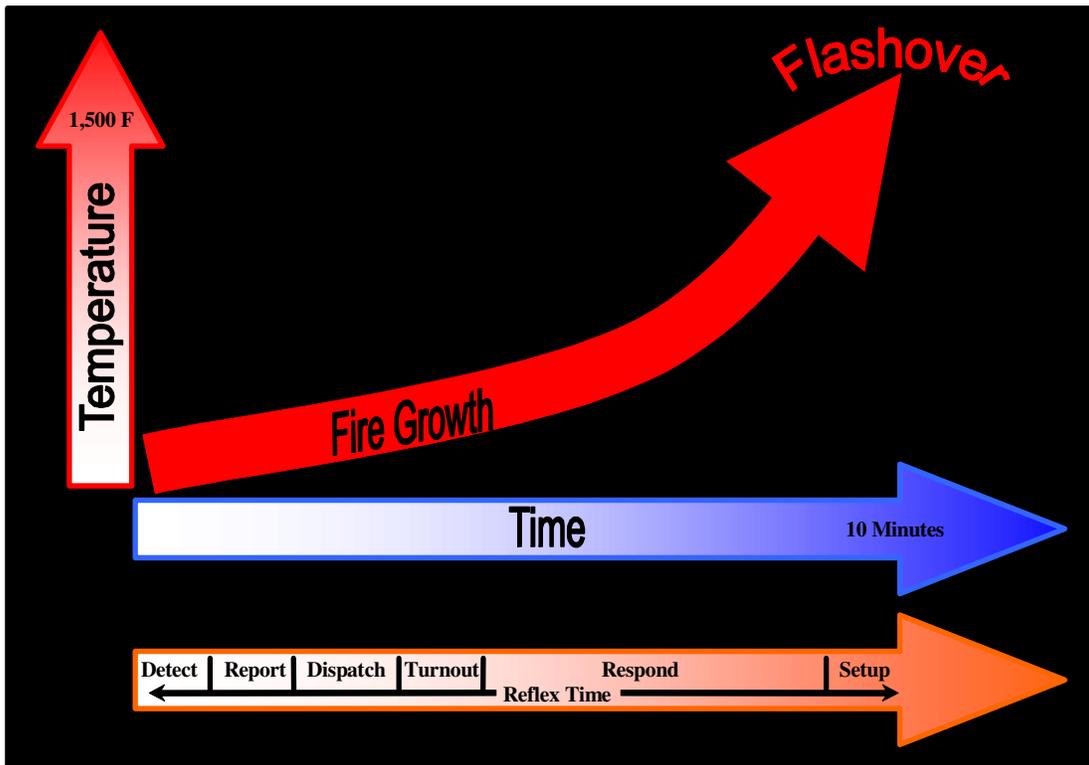
Perhaps as important as preventing flashover is the need to control a fire before it does damage to the structural framing of a building. Materials used to construct buildings today are often less fire resistive than the heavy structural skeletons of older frame buildings. Roof trusses and floor

joists are commonly made with lighter materials more easily weakened by the effects of fire. *Light weight* roof trusses fail after five to seven minutes of direct flame impingement. Plywood I-beam joists can fail after as little as three minutes of flame contact. This creates a very dangerous environment for firefighters.

In addition, the contents of buildings today have a much greater potential for heat production than in the past. The widespread use of plastics in furnishings and other building contents rapidly accelerate fire spread and increase the amount of water needed to effectively control a fire. All of these factors make the need for early application of water essential to a successful fire outcome.

A number of things must happen quickly to make it possible to achieve fire suppression prior to flashover. The figure below illustrates the sequence of events.

Figure 27: Fire Growth vs. Reflex Time



The reflex time continuum consists of six steps, beginning with ignition and concluding with the application of (usually) water. The time required for each of the six components varies. The policies and practices of the fire Rescue directly influence four of the steps, but two are only indirectly manageable. The six parts of the continuum are:

1. **Detection:** The detection of a fire may occur immediately if someone happens to be present or if an automatic system is functioning. Otherwise, detection may be delayed, sometimes for a considerable period.
2. **Report:** Today most fires are reported by telephone to the 9-1-1 center. Call takers must quickly elicit accurate information about the nature and location of the fire from persons who are apt to be excited. A citizen well trained in how to report emergencies can reduce the time required for this phase.
3. **Dispatch:** The dispatcher must identify the correct fire units, subsequently dispatch them to the emergency, and continue to update information about the emergency while the units respond. This step offers a number of technological opportunities to speed the process including computer aided dispatch and global positioning systems.
4. **Turnout:** Firefighters must don firefighting equipment, assemble on the response vehicle, and begin travel to the fire. Good training and proper fire station design can minimize the time required for this step.
5. **Respond:** This is potentially the longest phase of the continuum. The distance between the fire station and the location of the emergency influences reflex time the most. The quality and connectivity of streets, traffic, driver training, geography, and environmental conditions are also a factor.
6. **Set up:** Last, once firefighters arrive on the scene of a fire emergency, fire apparatus are positioned, hose lines stretched out, additional equipment assembled, and certain preliminary tasks performed (such as rescue) before entry is made to the structure and water is applied to the fire.

As apparent by this description of the sequence of events, application of water in time to prevent flashover is a serious challenge for any fire rescue. It is critical, though, as studies of historical fire loss data can demonstrate.

The NFPA studied data from residential structures occurring between 1994 and 1998 in order to analytically quantify the relationship between the growth of a fire beyond the room of origin and losses in life and property. As the figures below clearly indicate, fires contained to the room of

origin (typically extinguished prior to or immediately following flashover) had significantly lower rates of death, injury, and property loss when compared to fires that had an opportunity to spread beyond the room of origin (typically extinguished post-flashover). Incidents in which a fire spreads beyond the room where it originates are likely to experience six times the amount of property loss and have almost nine times greater chance of resulting in a fatality.

**Figure 28: National Data- Fire Growth to Life and Property Loss**

<b>Fire Extension in Residential Structure Fires, 1994 – 1998</b>			
<i>Extension</i>	<i>Rates per 1,000 Fires</i>		
	<i>Civilian Deaths</i>	<i>Civilian Injuries</i>	<i>Dollar Loss Per Fire</i>
Confined to room of origin	2.32	35.19	\$3,385
Beyond room of origin; confined to floor of origin	19.68	96.86	\$22,720
Beyond floor of origin	263.54	63.48	\$31,912

***Emergency Medical Event Sequence***

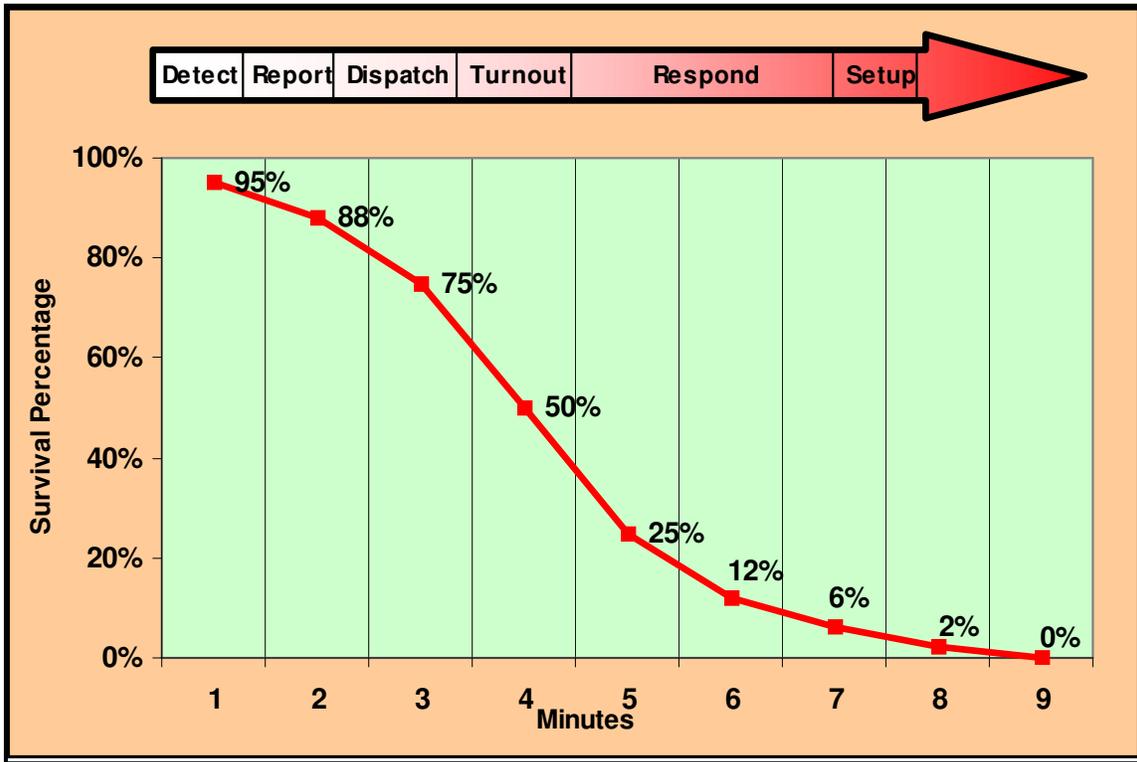
Cardiac arrest is the most significant life threatening medical event. A victim of cardiac arrest has mere minutes in which to receive definitive lifesaving care if there is to be any hope for resuscitation.

The American Heart Association (AHA) issued a set of cardiopulmonary resuscitation guidelines designed to streamline emergency procedures for heart attack victims, and to increase the likelihood of survival. The AHA guidelines include goals for the application of cardiac defibrillation to cardiac arrest victims.

Heart attack survival chances fall by seven to ten percent for every minute between collapse and defibrillation. Consequently, the AHA recommends cardiac defibrillation within five minutes of cardiac arrest.

As with fires, the sequence of events that lead to emergency cardiac care can be visually shown, as in the following figure.

Figure 29: Cardiac Arrest Event Sequence



The percentage of opportunity for recovery from cardiac arrest drops quickly as time progresses. The stages of medical response are very similar to the components described for a fire response. Recent research stresses the importance of rapid cardiac defibrillation and administration of certain drugs as a means of improving the opportunity for successful resuscitation and survival. An Oregon fire department recently studied the effect of time on cardiac arrest resuscitation and found that nearly all of their saves were within one and one-half miles of a fire station, underscoring the importance of quick response.

In an effort to improve CPR outcomes, OBIFD has purchased and implemented the use of a Zoll AutoPulse device to supplement manual CPR. The AutoPulse is known as a Load-Distributing Band (LDB) device and uses a constricting band attached to a short backboard to constrict the chest at a rate of 80 times per minute. This device allows personnel to concentrate on other aspects of resuscitation while leaving chest compressions to the device.

### ***People, Tools, and Time***

Time matters a great deal in the achievement of an effective outcome to an emergency event. Time, however, isn't the only factor. Delivering sufficient numbers of properly trained, appropriately equipped, personnel within the critical time period completes the equation.

For medical emergencies this can vary based on the nature of the emergency. Many medical emergencies are not time critical. However, for serious trauma, cardiac arrest, or conditions that may lead to cardiac arrest, response time is very critical.

Equally critical is delivering enough personnel to the scene to perform all of the concurrent tasks required to deliver quality emergency care. For a cardiac arrest, this can be up to six personnel; two to perform CPR, two to set up and operate advanced medical equipment, one to record the actions taken by emergency care workers, and one to direct patient care.

Thus, for a medical emergency the real test of performance is the time it takes to provide the personnel and equipment needed to deal effectively with the patient's condition, not necessarily the time it takes for the first person to arrive.

Fire emergencies are even more resource critical. Again, the true test of performance is the time it takes to deliver sufficient personnel to initiate application of water on the fire. This is the only practical method to reverse the continuing internal temperature increases and ultimately prevent flashover. The arrival of one person with a portable radio does not provide fire intervention capability and should not be counted as *arrival* by the fire department.

In order to legally enter a building to conduct interior firefighting operations at least four personnel must be on scene. The initial arrival of effective resources should be measured at the point in time when at least four personnel, properly trained and equipped, have assembled at the fire.

Emergency service agencies should have clearly defined response performance objectives established to allow evaluation of capability and service delivery. An organization's performance objectives should clearly state both the current and desired emergency service capabilities in very measurable terms. For emergency response, performance objectives should define response performance using both time and resource criteria. For example:

- *Provide for the arrival of adequate resources to initiate basic emergency medical services at the scene of any medical emergency within “X” minutes following dispatch, 90% of the time.*
- *Provide for the arrival of adequate resources to initiate interior fire suppression operations at the scene of any fire within “X” minutes following dispatch, 90% of the time.*

With specific performance criteria a fire department can develop deployment methodologies to achieve desired levels of performance, and can quickly identify when conditions in the environment degrade performance.

### ***NFPA 1720<sup>20</sup>***

The National Fire Protection Association (NFPA) has issued a response performance standard for all or mostly volunteer staffed fire services. In recognizing that volunteer departments across the United States cover a variety of communities, the recommended standards are classified according to population densities.

- Population greater than 1000 persons per square mile: *urban*
  - Within these types of communities, *NFPA 1720* recommends that the first company arrive at the scene of a structure fire within nine minutes of dispatch, 90% of the time.
- 500-1000 persons per square mile in population: *Suburban* time objective of
  - 10 minutes from time of dispatch, 80% of the time.
- Less than 500 persons per square mile: *Rural*
  - 14 minute response time, 80% of the time
- Greater than eight miles from a fire station: *Remote*
  - No response time requirement

The standard establishes that a response *company* consists of four personnel. The standard does not require that all four be on the same vehicle, but does expect that the four will operate as a single functioning unit once on scene. The *NFPA 1720* response time standard also requires that all four personnel be on scene within the recommended time frame.

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<sup>20</sup> *NFPA 1720: Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, 2004.

None of the Harpswell fire departments have adopted a response performance standard. However, given the Town's population density in addition to the *NFPA 1720* guidelines, a rural response time of 14 minutes from dispatch can be viewed as a comparable benchmark. It was determined that only the isolated islands were outside eight miles from a fire station.

### **Recorded System Response Performance**

Throughout this document, certain descriptive statistical measures are utilized which may not be familiar to all readers. In an effort to reduce confusion or the drawing of inaccurate conclusions, this section seeks to provide a brief explanation of these measures. The measures most often used which require clarification are the use of *average* and *percentile* measures.

#### ***Average***

The average measure is a commonly used descriptive statistic also called the mean of a data set. It is a measure which is a way to describe the central tendency, or the center of a data set. The average is the sum of all the points of data in a set divided by the total number of data points. In this measurement, each data point is counted and the value of each data point has an impact on the overall performance. Averages should be viewed with a certain amount of caution because the average measure can be skewed if an unusual data point, known as an outlier, is present within the data set. Depending on the sample size of the data set, the skewness can be either very large or very small.

For example, assume that a particular fire station with a response time objective of six minutes or less had five calls on a particular day. If four calls had a response time of eight minutes while the other call was across the street and only a few seconds away, the average would indicate the station was achieving its performance goal. However, four of the five calls, or 80 percent, were beyond the stated response time performance objective.

The opposite can also be true where one call with an unusually long response time can make otherwise satisfactory performance appear unacceptable. These calls with unusually short or long response time have a direct impact on the total performance measurements and the farther they are from the desired performance, the greater the impact.

The reason to compute average is because of its common use and ease of understanding that is associated with it. The most important reason for not using averages for performance standards is that it does not accurately reflect the performance for the entire data set. As illustrated above, one extremely good or bad call skewed the entire average. While it does reflect all values, it does not really speak to the level of accomplishment in a strong manner.

### ***Percentile***

With average measure, it is recognized that some data points are below the average and some are above the average. The same is true for a median measure which simply arranges the data set in order and finds the value in which 50 percent of the data points are below the median and the other half are above the median value. This is also called the 50<sup>th</sup> percentile.

When you deal with fractiles or percentages, the actual value of the individual data does not have the same impact as it did in the average. The reason for this is that the fractile is nothing more than the ranking of the data set. The 90th percentile means that 10 percent of the data is greater than the value stated and all other data is at or below this level.

Higher fractile measurements are normally used for performance objectives and performance measurement because they show that the large majority of the data set has achieved a particular level of performance. This can be compared to the desired performance objective to determine the degree of success in achieving the goal.

Total response time is the amount of time a resident or business waited until an apparatus arrived at the scene of emergency, beginning when they first called the designated emergency number, often 9-1-1. It is made up of several elements which were discussed earlier. Since the fire department has no influence on call processing time, fire departments are measured on response time from the time of dispatch to the arrival on scene. The sections that follow analyze the response time performance for each fire organization within the Town.

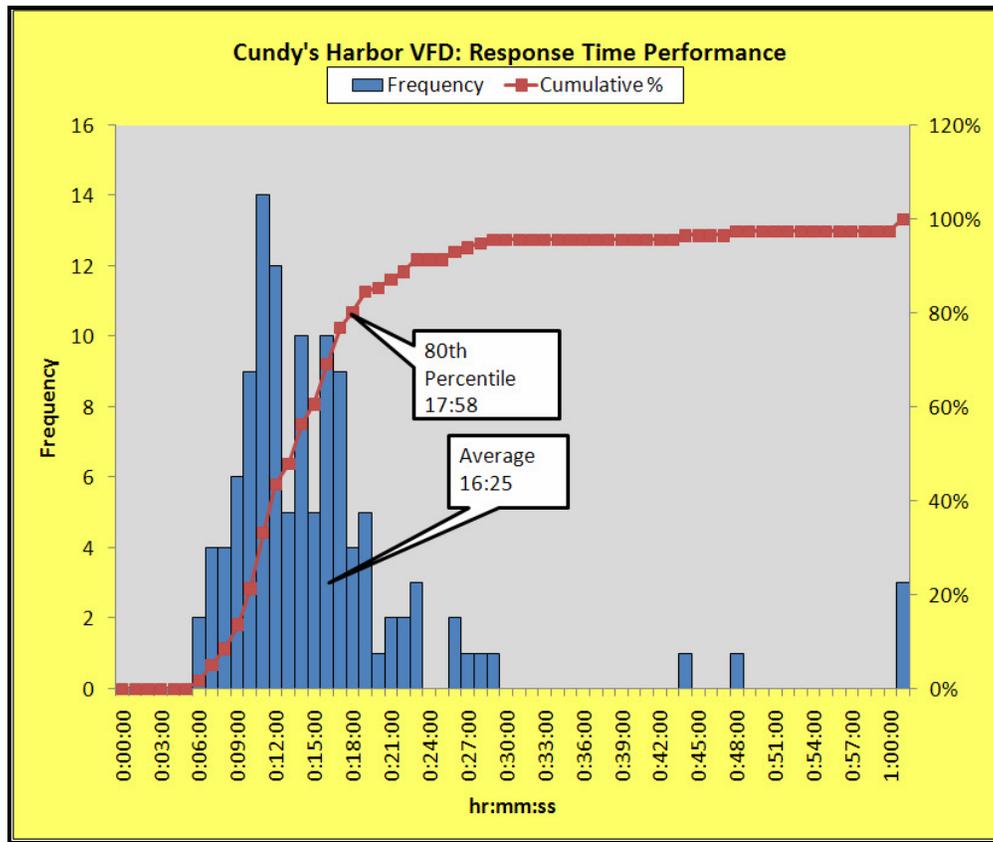
### ***Cundy's Harbor Volunteer Fire Department***

The following chart illustrates the overall response time frequency for the CHVFD over the last full year of data provided.<sup>21</sup>

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<sup>21</sup> Mutual aid calls and non-emergent calls were removed from response time analyses as they were found.

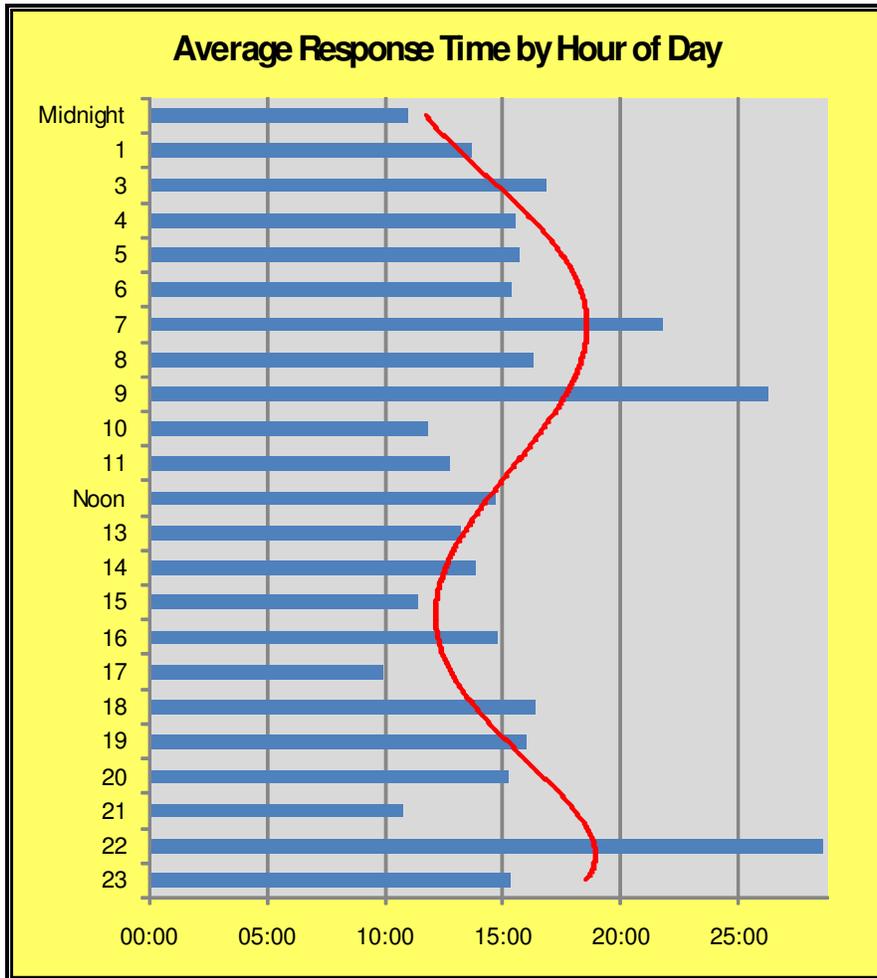
Figure 30: CHVFD Response Time Performance History



While many calls were answered within ten to 12-minute response time range, longer response times to other incidents skewed the average of all calls up to 17 minutes and 58 seconds. It is important to note that 80 percent of all calls are answered within a 17 minute, 58 second response time which is three minutes and 58 seconds over the comparable *NFPA 1720* benchmark.

Response times can vary by time of day in reflection of service demand workload, traffic congestion, weather, available staff, and distance to the call from the station to name but a few. The *average* total response time for all emergency incidents ranged from a high average of 28 minutes and 36 seconds for all calls between 10:00 and 11:00 p.m., to a low average of nine minutes and 56 seconds for incidents between 5:00 and 6:00 p.m.

Figure 31: CHVFD Average Response Time by Hour of Day<sup>22</sup>

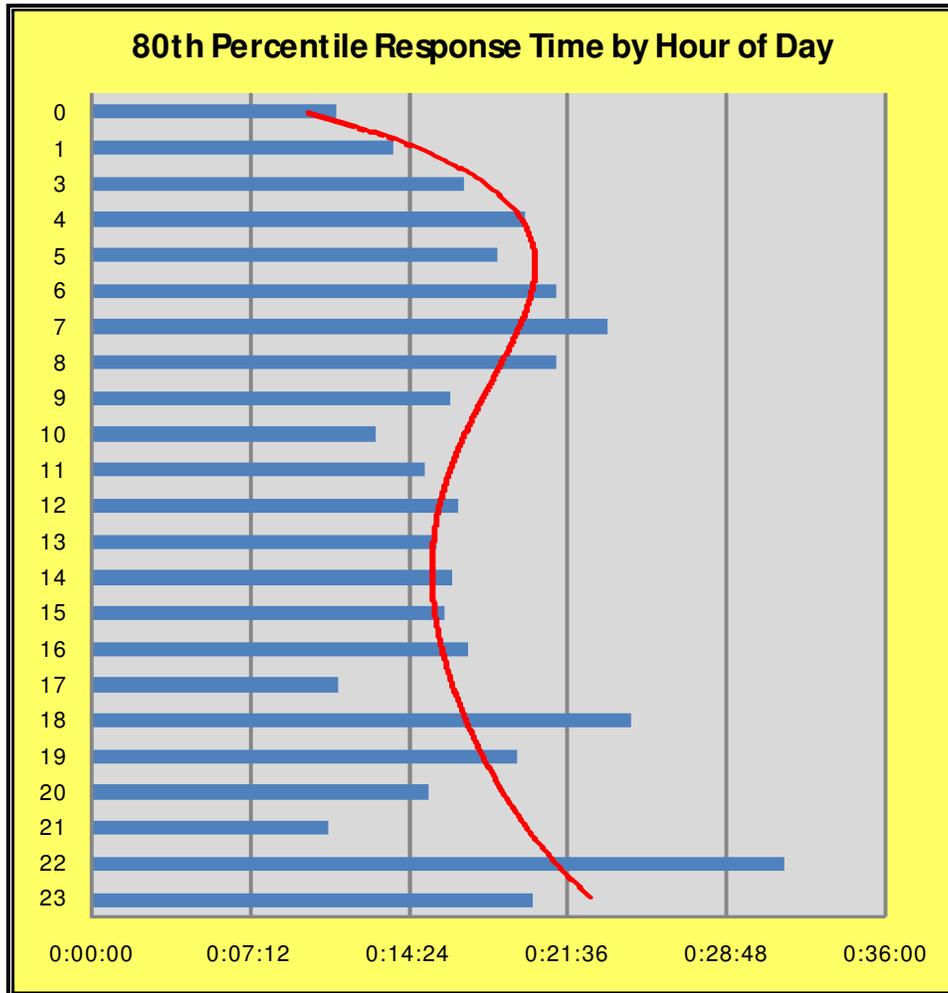


As discussed, more significant is how well the majority of emergency response demand is being serviced. One useful way to determine how well demand-based coverage is achieved is by determining maximum response time to a larger percentage of the incidents, in this case 80 percent.

The 80<sup>th</sup> percentile response time for emergency incidents occurring within the department ranged from a high of 31 minutes and 21 seconds during the 10:00 to 11:00 p.m. hour, to a low of 10 minutes and 41 seconds during 9:00 to 10:00 p.m. The following figure displays the 80<sup>th</sup> percentile response time performance by hour of day for all calls within for the department.

<sup>22</sup> No data for 2:00 a.m.

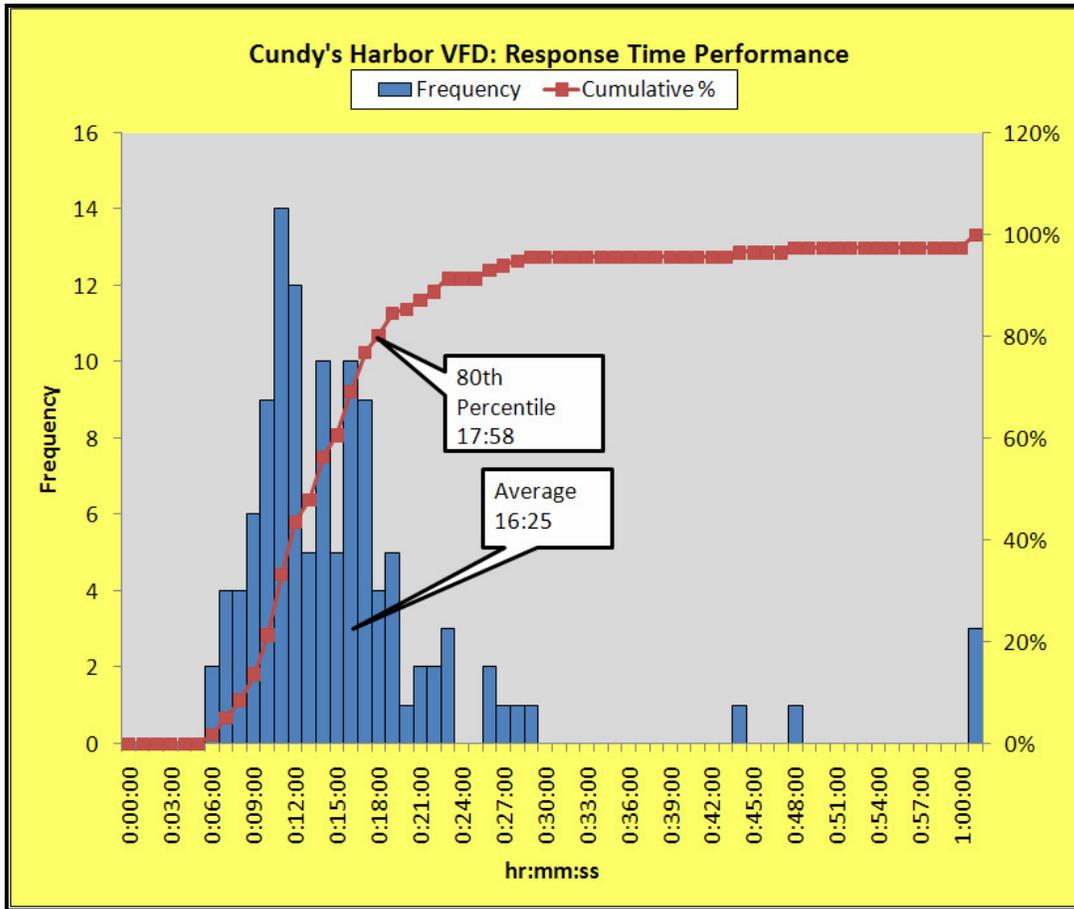
Figure 32: CHVFD 80th Percentile Response Time by Hour of Day<sup>23</sup>



An important component in the measurement of response time is the amount of time from notification of an alarm, to when firefighters are actually responding to the call with an apparatus. In many volunteer organizations, members are notified by an alert pager while home, work, or at other locations. The volunteer's ability to respond is dependant many times on their location. They may be out of town, at work, offshore, or otherwise committed to a task such as caring for young children. The longer the amount of time it takes to assemble a crew to respond to an incident, the negative effect it has on overall response times. The following figure measures the turnout time performance for the department in the last year.

<sup>23</sup> No data for 2:00 a.m.

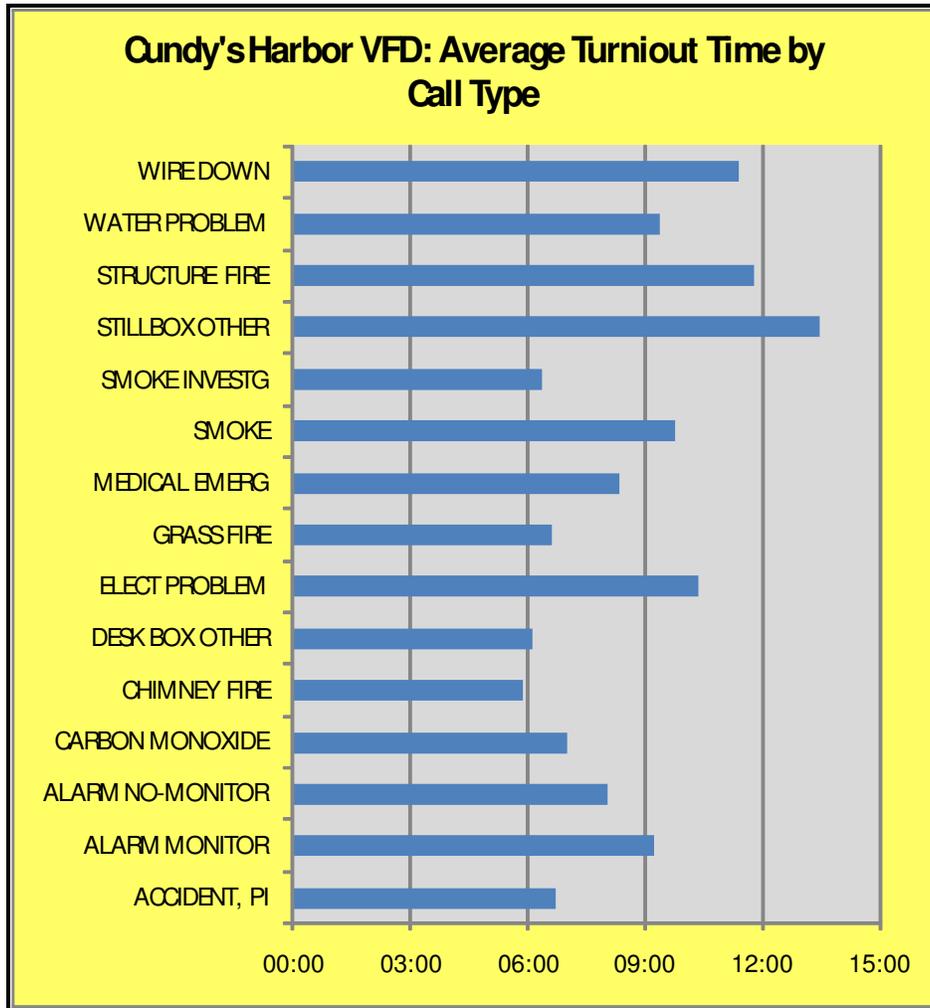
Figure 33: CHVFD Turnout Time Performance



While most calls are responded to within six to seven minutes of firefighters assembling at the station, the overall average is nine minutes and 24 seconds due to times when it took longer to assemble a crew. The apparatus began en route to a call within 13 minutes and six seconds 90 percent of the time.

In some volunteer organizations, depending on the qualifications of the membership, turnout times can become extended as medical, hazardous materials, and technical rescue personnel arrive at the station. Therefore, it is beneficial to examine turnout times by the nature of the call to determine possible needs of membership training.

Figure 34: CHVFD Average Turnout Time by Call Type

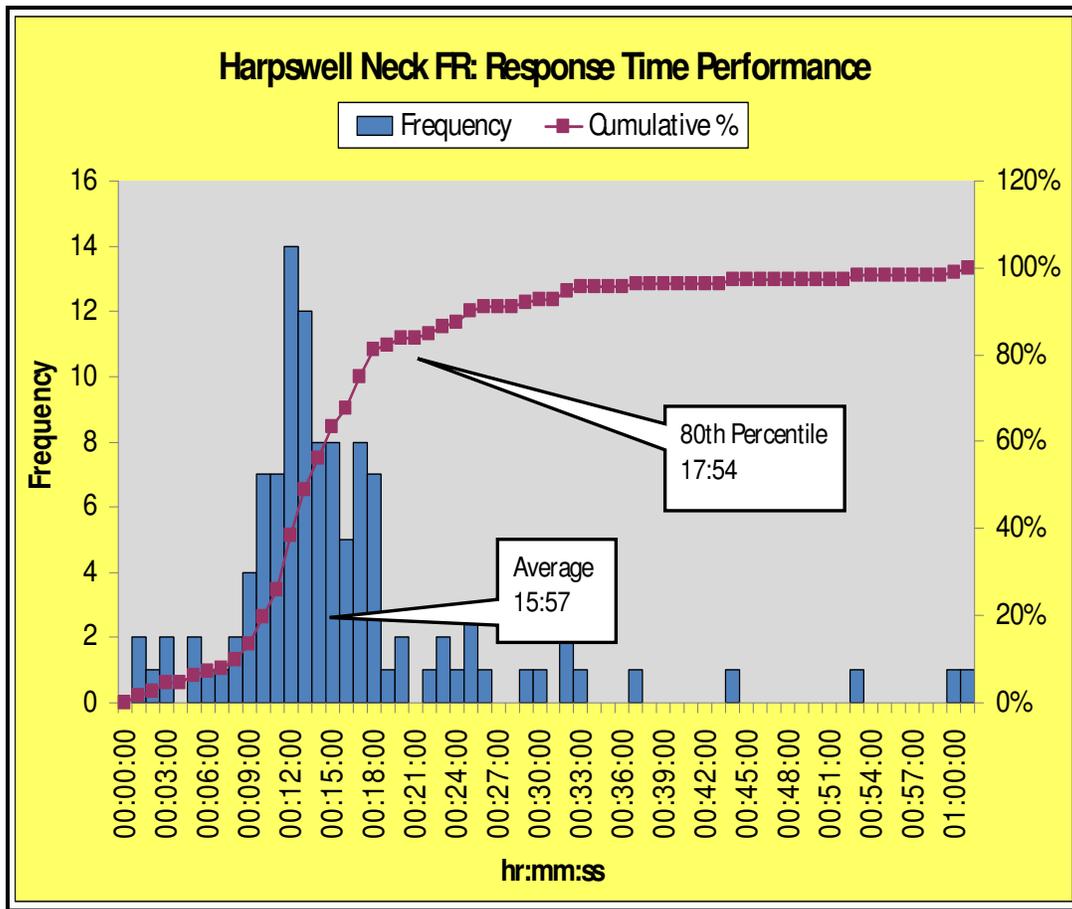


**Harpswell Neck Fire and Rescue**

The following chart illustrates the overall response time frequency for the Harpswell Neck Fire and Rescue over the last full year of data provided.<sup>24</sup>

<sup>24</sup> Mutual aid calls and non-emergent calls were removed from response time analyses as they were found.

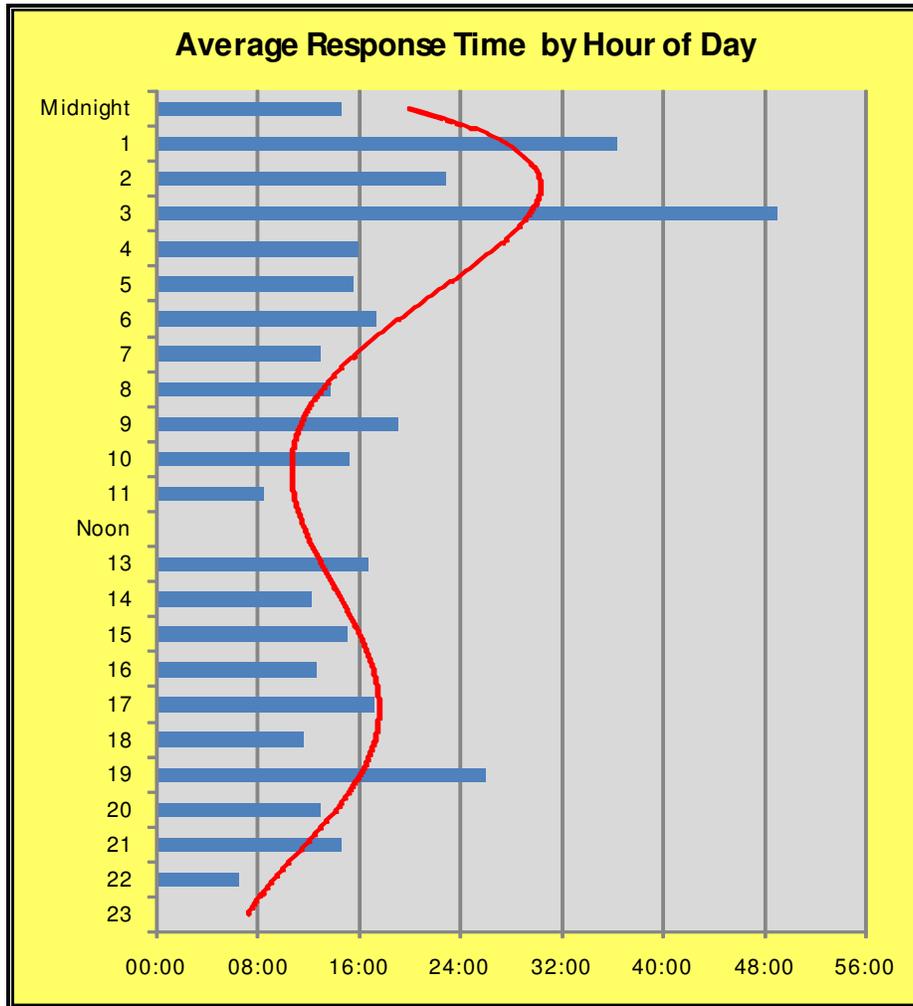
Figure 35: HNFR Response Time Performance History



While many calls were answered within a 12-minute response time range, longer response times to other incidents skewed the average of all calls up to 15 minutes and 57 seconds. It is important to note that 80 percent of all calls are answered within a 17 minute, 54 second response time, which is greater than the comparable *NFPA 1720* benchmark.

Response times can vary by time of day in reflection of service demand workload, traffic congestion, weather, available staff, and distance to the call from the station to name but a few. The *average* total response time for all emergency incidents ranged from a high average of 49 minutes and three seconds for all calls between 3:00 and 4:00 a.m., to a low average of six minutes and 33 seconds for incidents between 10:00 and 11:00 p.m. Generally, response times for this department are generally stable otherwise.

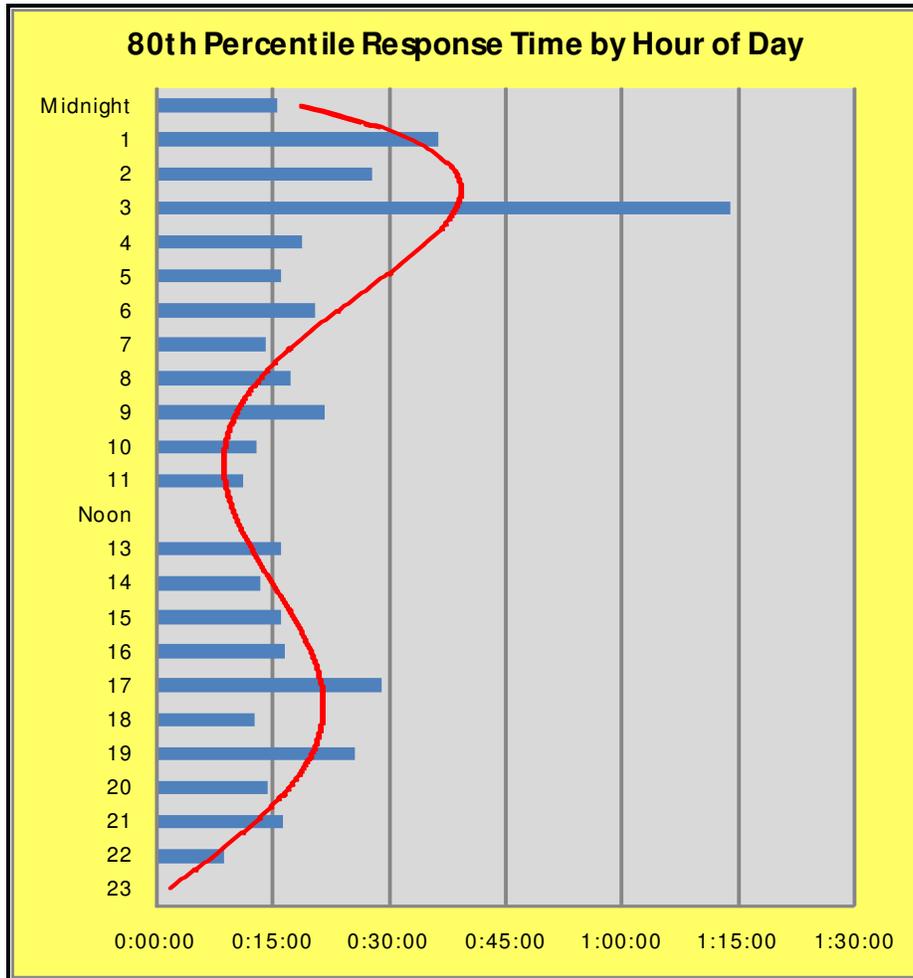
Figure 36: HNFR Average Response Time by Hour of Day



The 80<sup>th</sup> percentile response time for emergency incidents occurring within the department ranged from a high of over an hour during the 3:00 a.m. to 4:00 a.m. hour, to a low of eight minutes and 50 seconds during the 10:00 p.m. to 11:00 p.m. hour.

The following figure displays the 80<sup>th</sup> percentile response time performance by hour of day for all calls for the department.

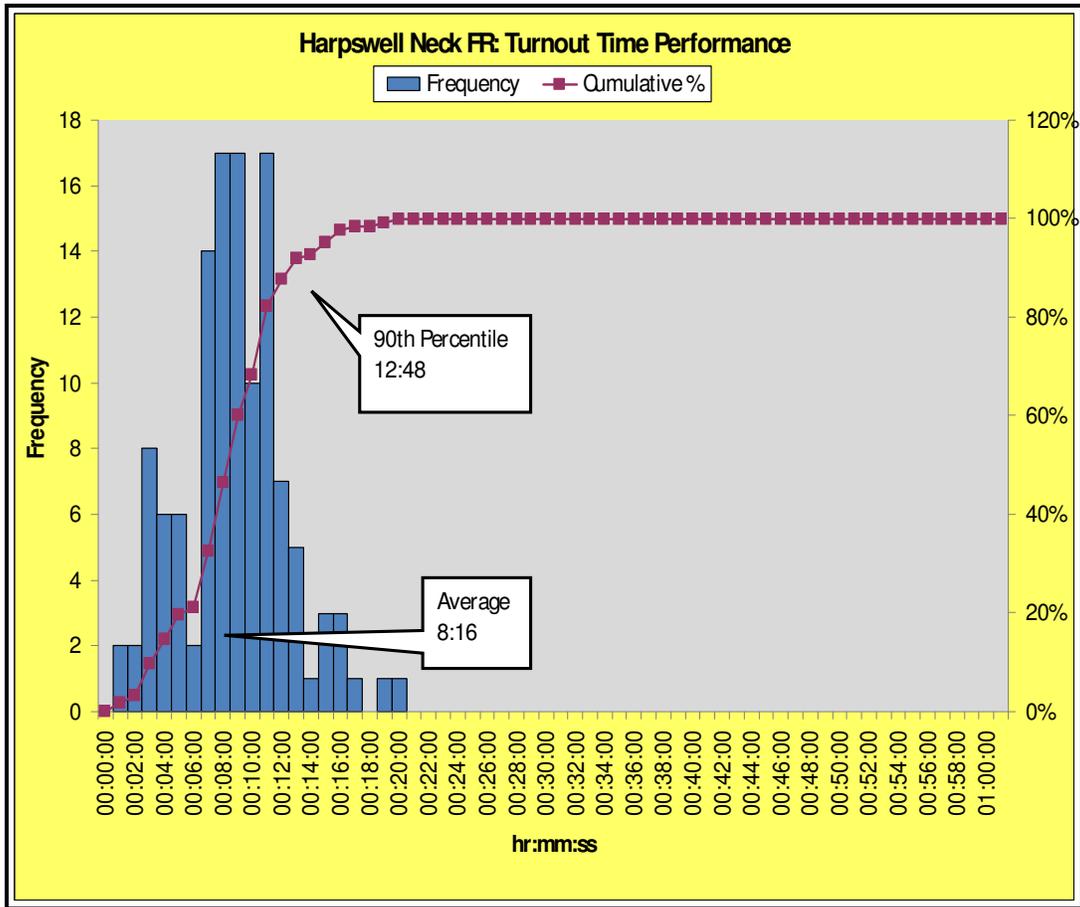
Figure 37: HNFR 80th Percentile Response Time by Hour of Day



An important component in the measurement of response time is the amount of time from notification of an alarm, to when the firefighters are actually responding to the call with an apparatus. In many volunteer organizations, members are notified by an alert pager while home, work, or at other locations. The volunteer's ability to respond is dependant many times on their location. They may be out of town, at work, offshore, or otherwise committed to a task such as caring for young children. The longer the amount of time it takes to assemble a crew to respond to an incident, the negative effect it has on overall response times.

The following figure measures the turnout time performance for the department in the last year.

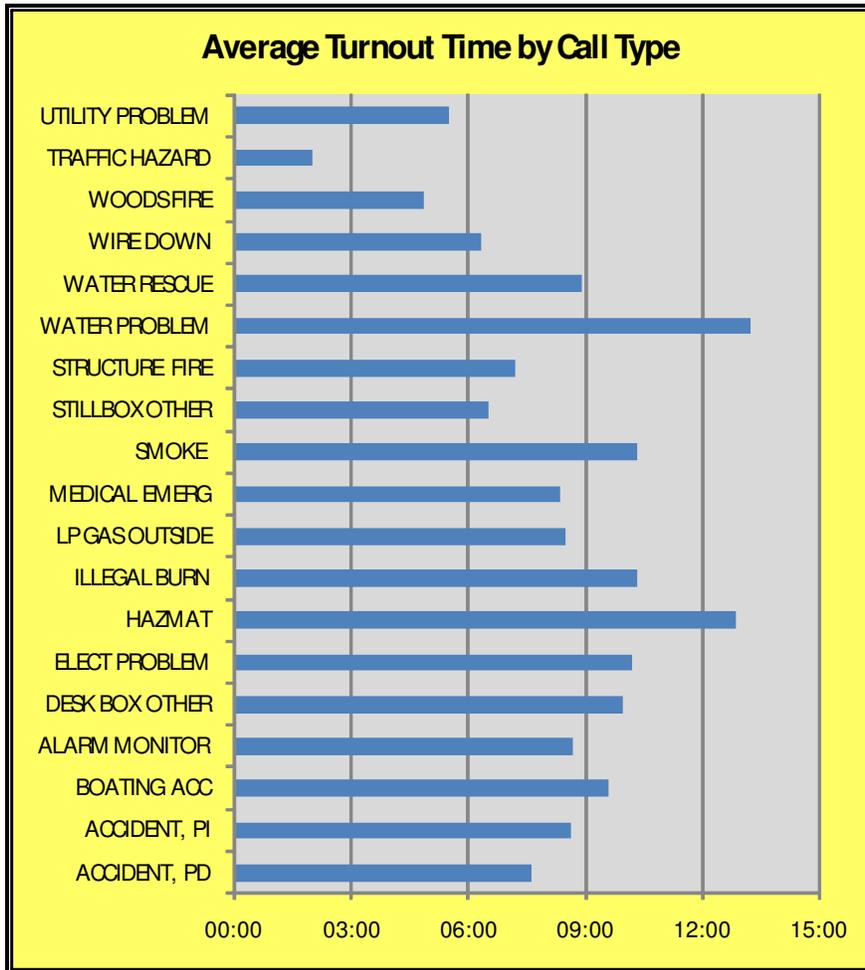
Figure 38: HNFR Turnout Time Performance



The overall average turnout time is eight minutes and 16 seconds while the time that the apparatus began enroute to a call is within 12 minutes and 48 seconds, 90 percent of the time.

In some volunteer organizations, depending on the qualifications of the membership, turnout times can become extended as medical, hazardous materials, and technical rescue personnel arrive at the station. Therefore, it is beneficial to examine turnout times by the nature of the call to determine possible needs of membership training.

Figure 39: HNFR Average Turnout Time by Call Type

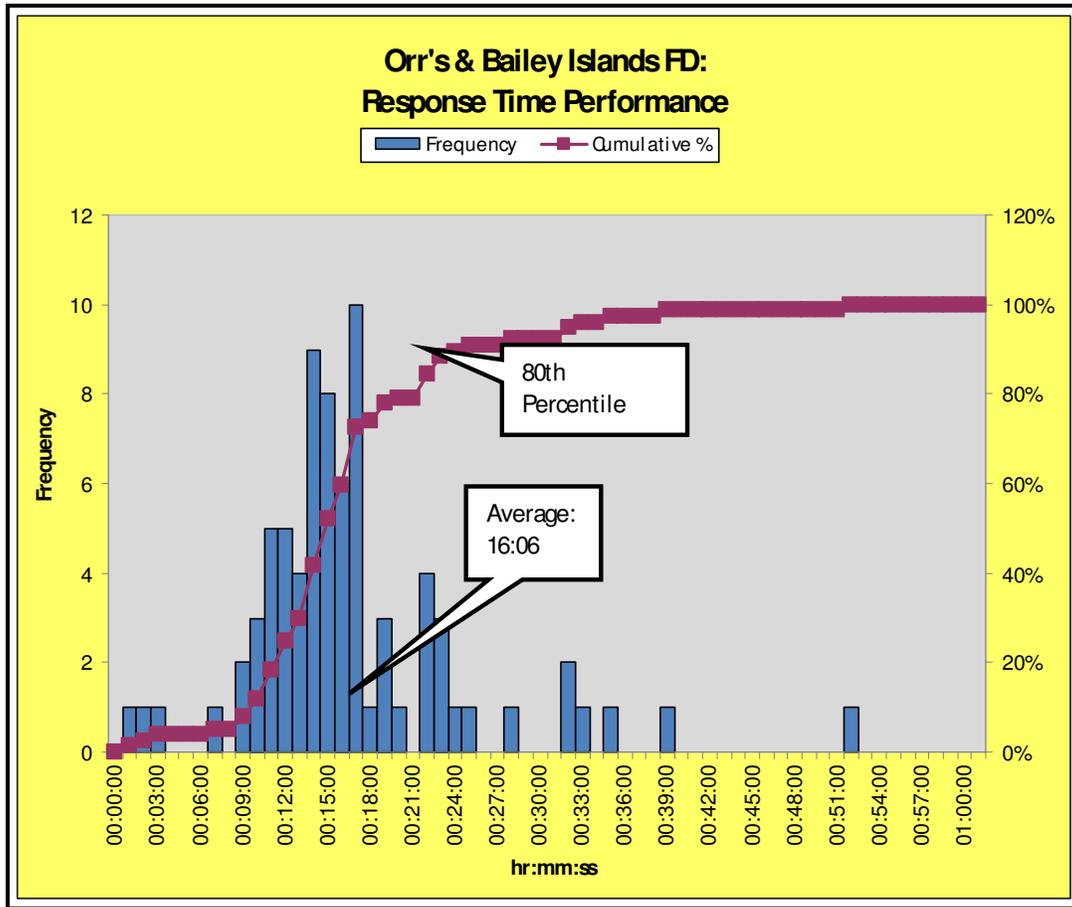


**Orr’s & Bailey Islands Fire Department**

The following chart illustrates the overall response time frequency for the Orr’s & Bailey Islands Fire Department over the last full year of data provided.<sup>25</sup>

<sup>25</sup> Mutual aid calls and non-emergent calls were removed from response time analyses as they were found.

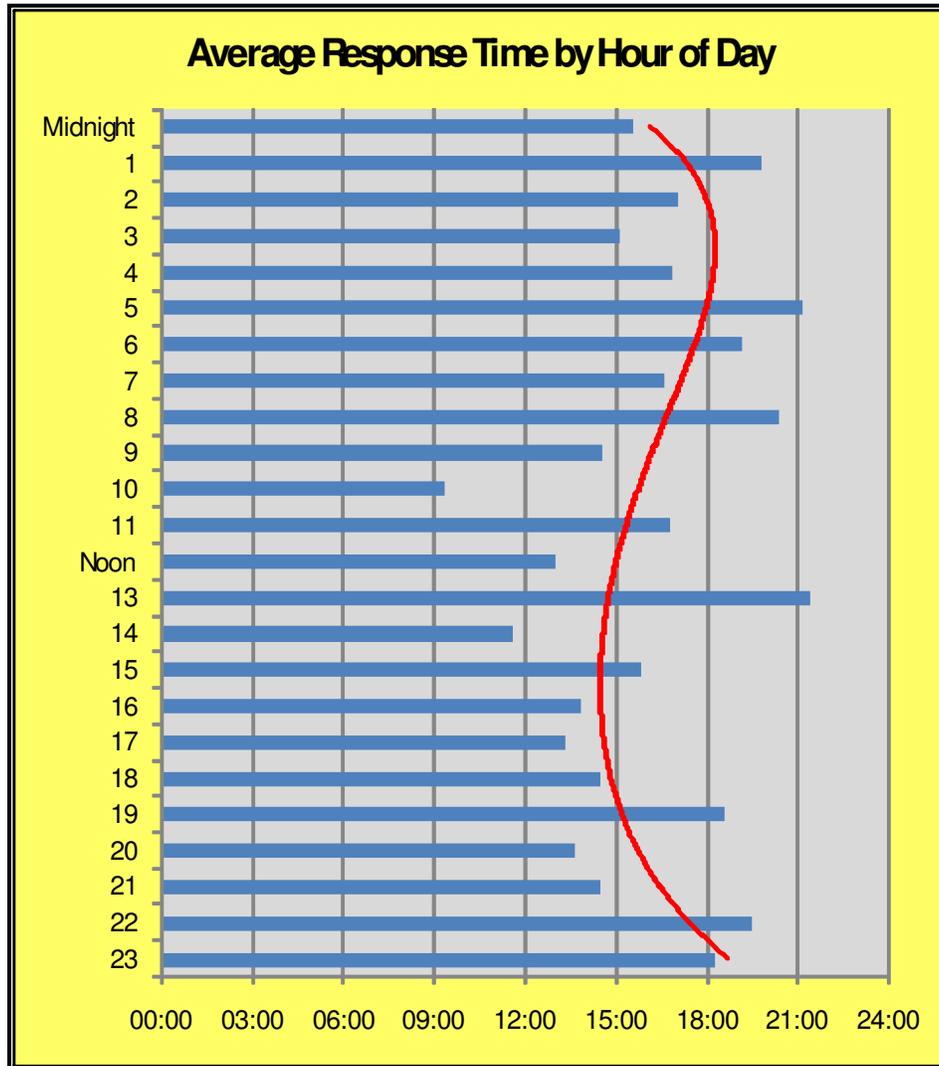
Figure 40: OBIFD Response Time Performance History



The average response time for the department is 16 minutes and 6 seconds, while 80 percent of all calls are answered within a 21-minute 6-second response time.

Response times can vary by time of day in reflection of service demand workload, traffic congestion, weather, available staff, and distance to the call from the station to name but a few. The *average* total response time for all emergency incidents ranged from a high average of 21 minutes and 23 seconds for all calls between the hour of 1:00 and 2:00 p.m., to a low average of 9 minutes and 23 seconds for incidents between 10:00 and 11:00 a.m.

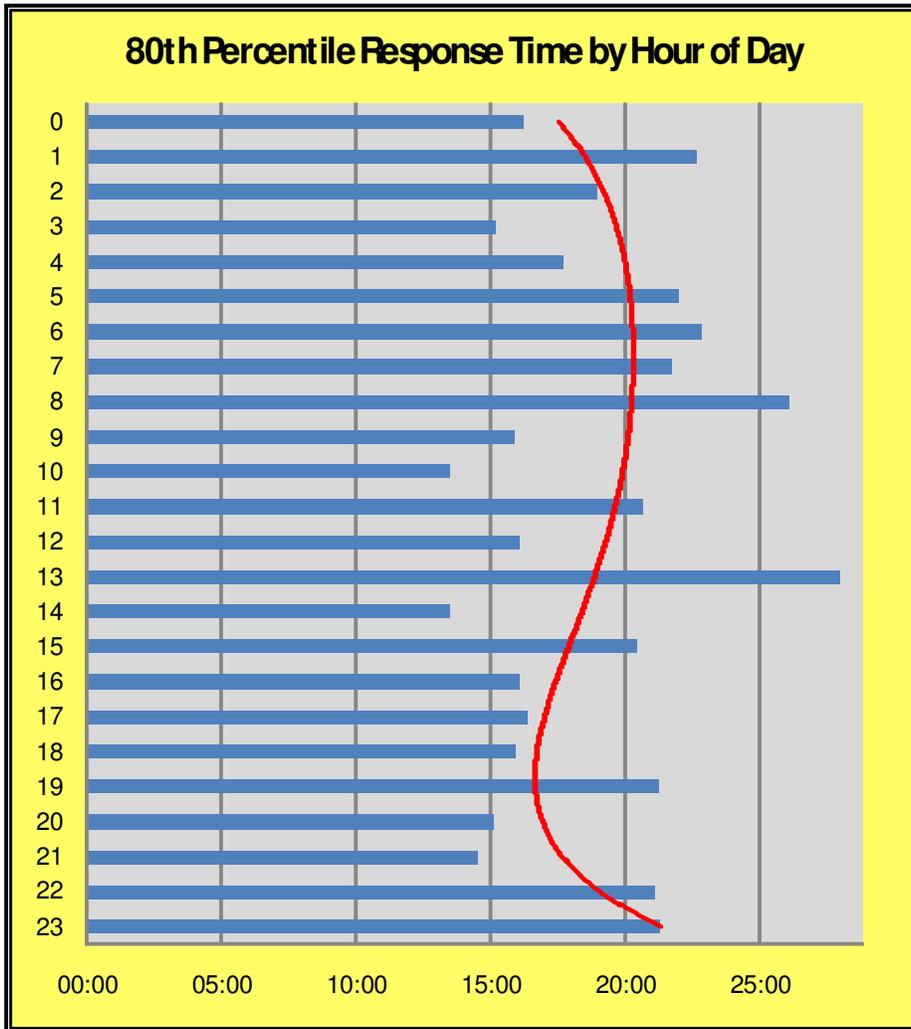
Figure 41: OBIFD Average Response Time by Hour of Day



The 80<sup>th</sup> percentile response time for emergency incidents occurring within the department ranged from a high of 27 minutes and 15 seconds during the 1:00 to 2:00 p.m. hour, to a low of 13 minutes and 27 seconds between 10:00 to 11:00 a.m.

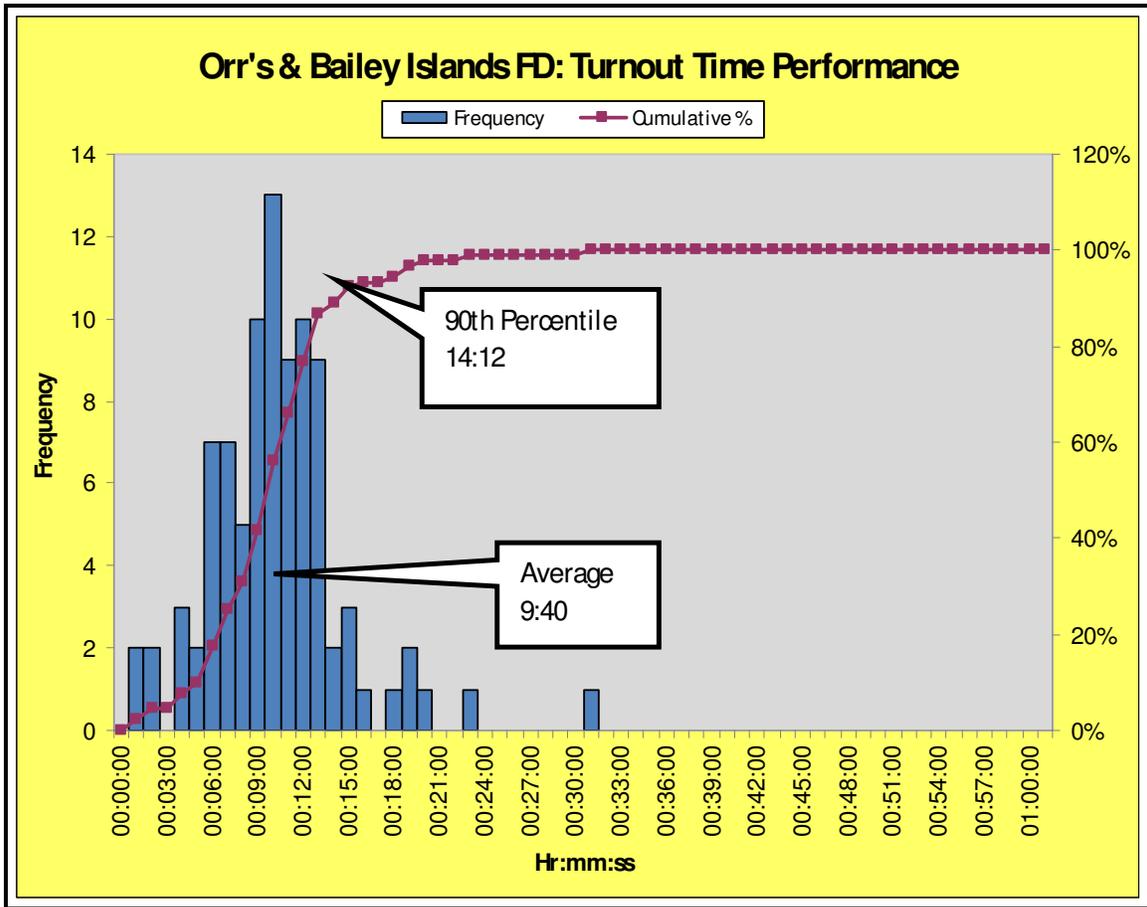
The following figure displays the 80<sup>th</sup> percentile response time performance by hour of day for all calls within for the department.

Figure 42: OBIFD 80th Percentile Response Time by Hour of Day



An important component in the measurement of response time is the amount of time from notification of an alarm, to when the firefighters are actually responding to the call with an apparatus. In many volunteer organizations, members are notified by an alert pager while home, work, or at other locations. The volunteer's ability to respond is dependant many times on their location. They may be out of town, at work, offshore, or otherwise committed to a task such as caring for young children. The longer the amount of time it takes to assemble a crew to respond to an incident, the negative effect it has upon overall response times. The following figure measures the turnout time performance for the department in the last year.

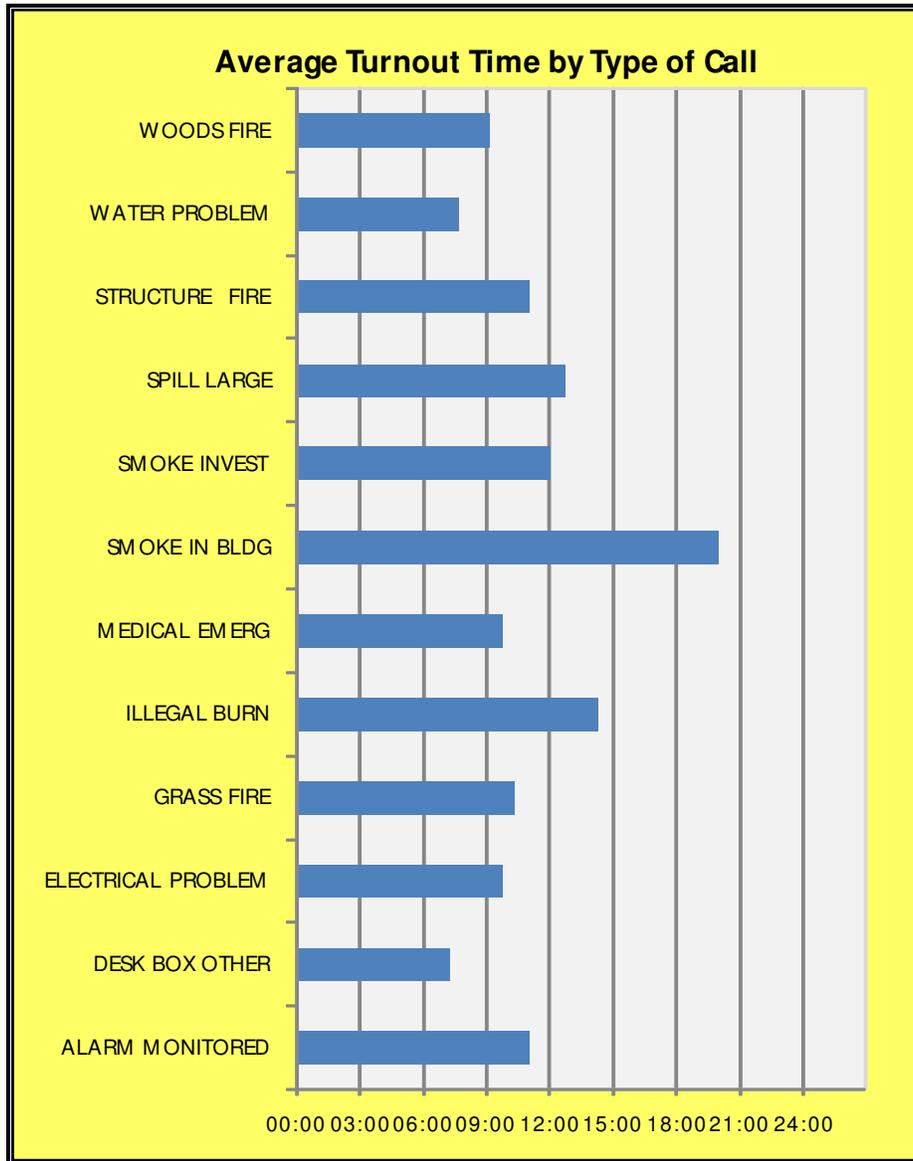
Figure 43: OBIFD Turnout Time Performance



While most calls are responded to within nine minutes of firefighters assembling at the station, the overall average is nine minutes and 40 seconds, due to times when it took longer to assemble a crew. The apparatus began enroute to a call within 14 minutes and 12 seconds 90 percent of the time.

In some volunteer organizations, depending on the qualifications of the membership, turnout times can become extended as medical, hazardous materials, and technical rescue personnel arrive at the station. Therefore, it is beneficial to examine turnout times by the nature of the call to determine possible needs of membership training.

Figure 44: OBIFD Average Turnout Time by Call Type



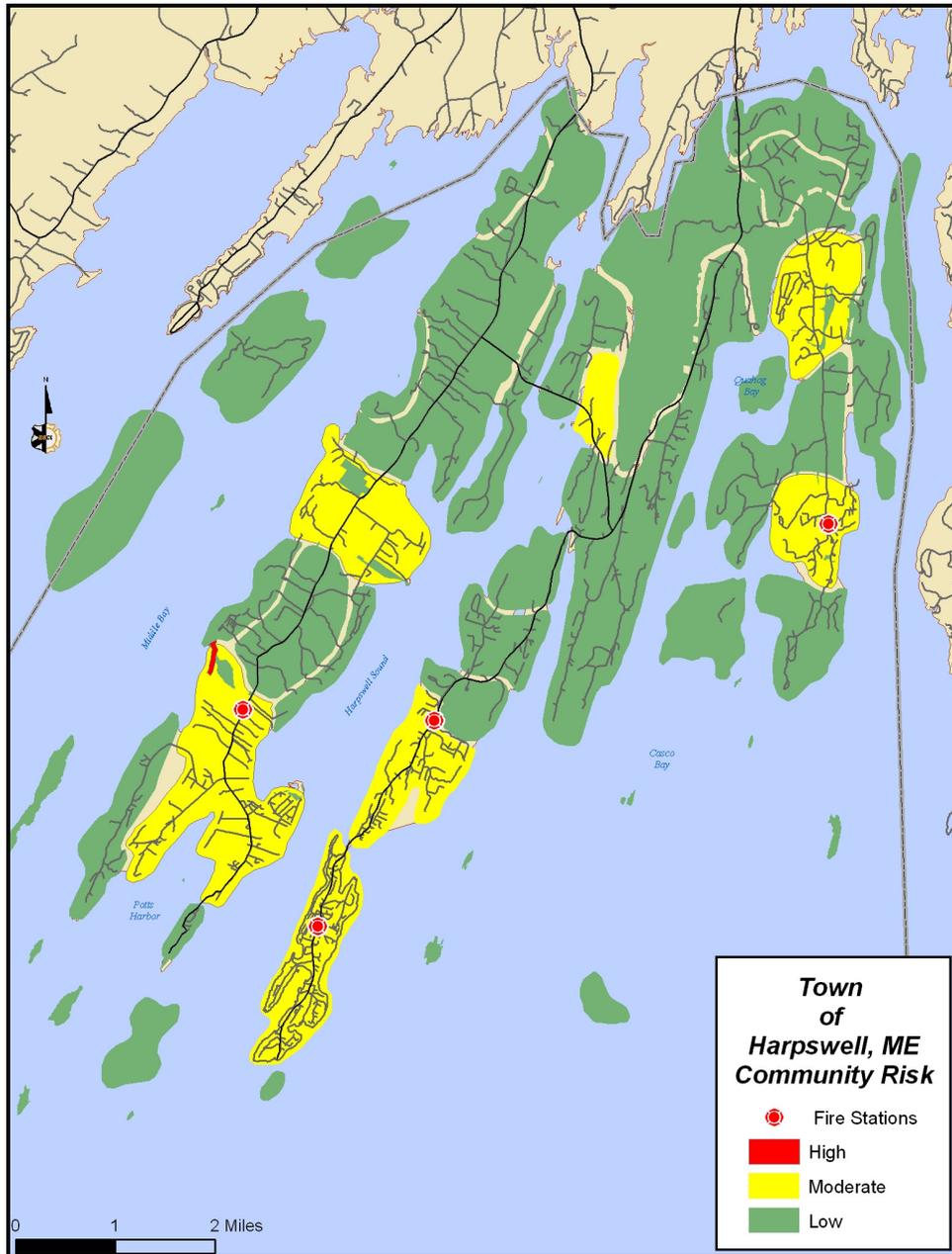
### Community Risk Analysis

The fire service assesses the relative risk of properties based on a number of factors. Properties with high fire and life risk 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 geographic sub-areas of a community.

The community's risk assessment has been developed based on current land use within the city. These uses are found in the Town's development plans and zoning designations. The following map translates land use to categories of relative fire and life risk.

- Low risk – Areas zoned and used for agricultural purposes, open space, low-density residential, and other low intensity uses.
- Moderate risk – Areas zoned for medium-density single family properties, small commercial and office uses, low-intensity retail sales, and equivalently sized business activities.
- High risk – Higher-intensity business districts, mixed use areas, high-density residential, industrial, warehousing, and large mercantile centers.

Figure 45: Community Risk Assessment



The community contains mostly low risk properties. The predominance of highest risk is located in Harpswell’s villages and settlements at the peninsular ends. These properties include a mixed-use of commercial and single-family occupancies. The Town center property has yet to be developed, but is zoned for neighborhood commercial and municipal offices. The single area noted as ‘high risk’ is rated as such due to its industrial/commercial zoning designation, but is currently not developed as such.

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## Water Supply

The Town of Harpswell depends on tanker shuttles for its fire protection water supply. During a tanker shuttle, the fire department typically establishes at least one *water point*, a location from which water can be pumped into the tankers by means of either a drafting pumper or gravity flow. The flow of water requires tanker trucks to move back and forth between a fire scene and the water point.

Time is consumed at the point where the tankers are loaded with water, known as *load time*. Time is also consumed at the point where they discharge their water at the fire scene, typically into portable dump tanks, known as the *offload time*. The final element of time in a tanker shuttle is consumed by travel back and forth, which is dependent on the distance between the fire and the water point.

During interviews, it became obvious that the community has limited number of water points available for fire protection supply. This is a critical factor in the ability of the fire departments to maintain adequate flow of water at a fire scene, quantified by the measurement of gallons per minute (GPM). An inadequate GPM flow can result in continued fire spread and the inability to control a fire.

The size of the building and the area involved in fire are used to determine the needed fire flow in GPM. The National Fire Academy teaches the following methodology for this calculation.

$$\begin{aligned} & \text{(length X width)/3= GPM per floor} \\ & \text{GPM per floor X \# of floors} \\ & \text{Total GPM X \% of fire involvement} \end{aligned}$$

For example, a two-story residential structure that is 40 feet in length by 30 feet wide that was 60 percent involved in fire would have a needed fire flow of 480 gallons per minute.

It is critical that the fire departments know their ability to deliver this quantity of water throughout the Town's geography. This can be calculated when certain factors are known. For instance, in the following chart, ESCi provides example calculations of the ability of a tanker shuttle to

deliver GPM, based on the size of the tankers, the load and offload times, and the distance to a water point. Distances are shown in miles.

**Figure 46: Sample Tanker Shuttle Capability Calculations**

<b>Tanker Shuttle Flow Capability Examples</b>			
	Capacity	Load Time	Offload Time
<b>Example Tanker 1</b>	1500	04:00	01:10
<b>Example Tanker 2</b>	1750	03:20	01:20
<b>Example Tanker 3</b>	1400	02:45	02:00
<b>Distance</b>	1.5		
<b>GPM Flow</b>	593		
<b>Distance</b>	2		
<b>GPM Flow</b>	526		
<b>Distance</b>	3		
<b>GPM Flow</b>	429		
<b>Distance</b>	4		
<b>GPM Flow</b>	362		
<b>Distance</b>	4		
<b>GPM Flow</b>	362		
<b>Distance</b>	4		
<b>GPM Flow</b>	362		

It becomes obvious that this example of a three-tanker shuttle could not deliver the necessary GPM flow for the example two-story structure if the water point was more than three miles away.

It is important that the fire departments complete true and accurate calculations of their normal tanker shuttle capability, using tested load and offload times and true capacity (based on weight testing). Maps can be generated using known, established water points that would demonstrate GPM flow capability on all Town street segments. The map street segments could be color-coded to show GPM capability.

More importantly, once this calculation effort was completed, it would become relatively obvious where additional water points would most benefit the Town. To that end, additional effort could be made to obtain rights to any existing static supplies. It is also possible that new water points, such as cisterns or gravity tanks, could be installed.

It is equally important that the Town recognize the criticality of GPM flow and the proximity of water points as it considers new development or redevelopment areas. The Town is in the best

position to require installation of adequate and plentiful water points through land use regulations and permit processes.

The establishment of additional water points, spread strategically throughout the Town, would have some of the greatest positive impact on the firefighting abilities of the Town's fire departments.

**Recommendations:**

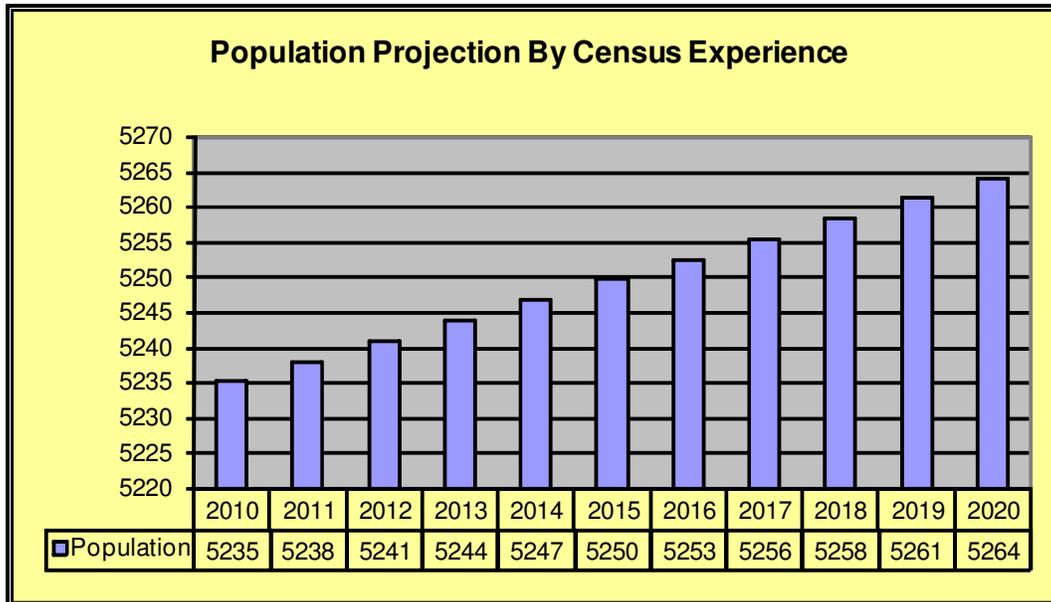
- The fire departments should complete accurate calculations of their normal tanker shuttle capability, using tested load and offload times and true capacity (based on weight testing). Maps can be generated using established water points in the Town, color-coded to demonstrate GPM flow capability.
- The Town of Harpswell should continually recognize the criticality of GPM flow and the proximity of water points as it considers new development or redevelopment areas. The Town is in the best position to require installation of adequate and plentiful water points through land use regulations and permit processes.

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## Future Service Demand Projections

In order to develop service demand projections, growth in terms of population based on census and development are examined. As indicated, the population of Harpswell has increased in the last decade. ESCi anticipates additional growth will continue into the future. In developing forecasts for population growth, we typically develop a forecast based on several years of census experience. For Harpswell, we used census figures from 2000 through 2007. A mathematical forecast is created through the year 2020. The resulting population forecast appears as follows.

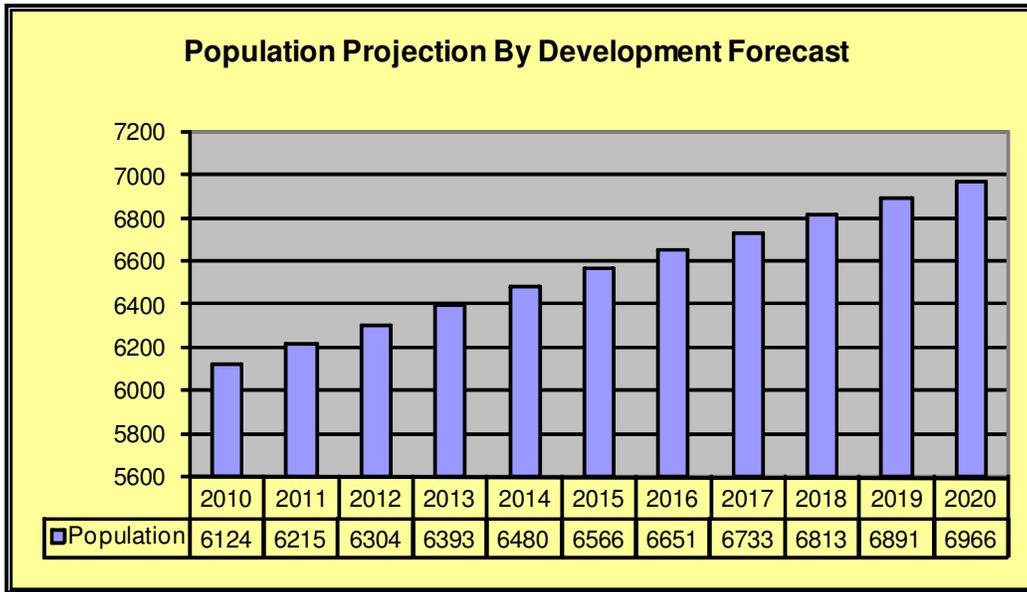
Figure 47: Census Population Forecast



While census-based population projections provide a mathematically based estimate of future population based on historical data, they often fail to account for expected trends in the growth rate of an area. These changes often result from redevelopment, annexation, changes in employment capacity, or other socio-economic factors not reviewed in a census-based projection. For this reason, ESCi also offers population projections based on review of available local development and business information.

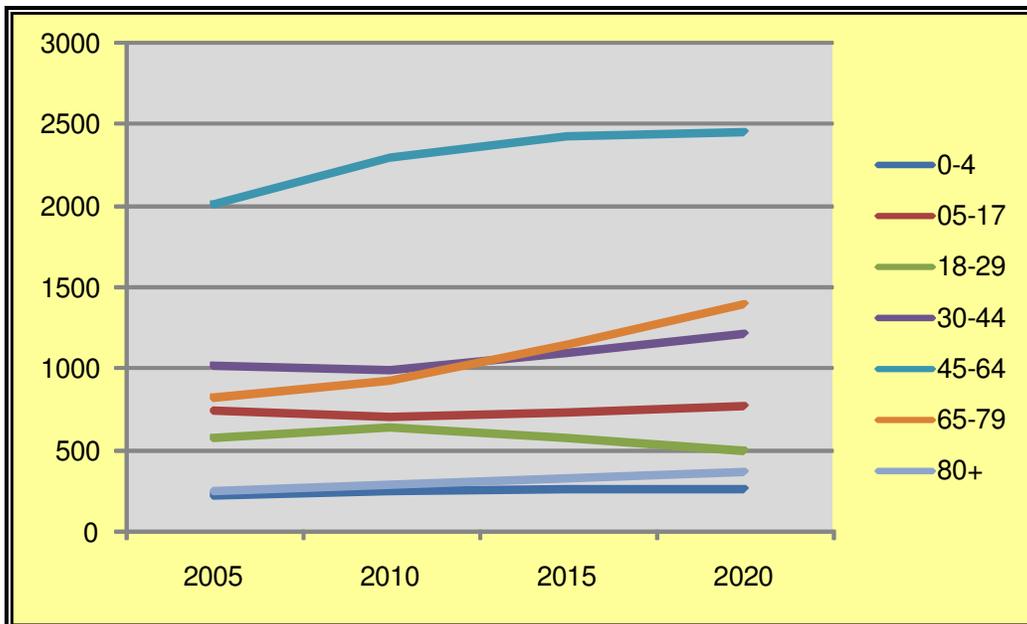
In this case, ESCi reviewed information provided from the Town’s comprehensive plan as well as the Maine State Planning Office.

Figure 48: Development-based Population Projection



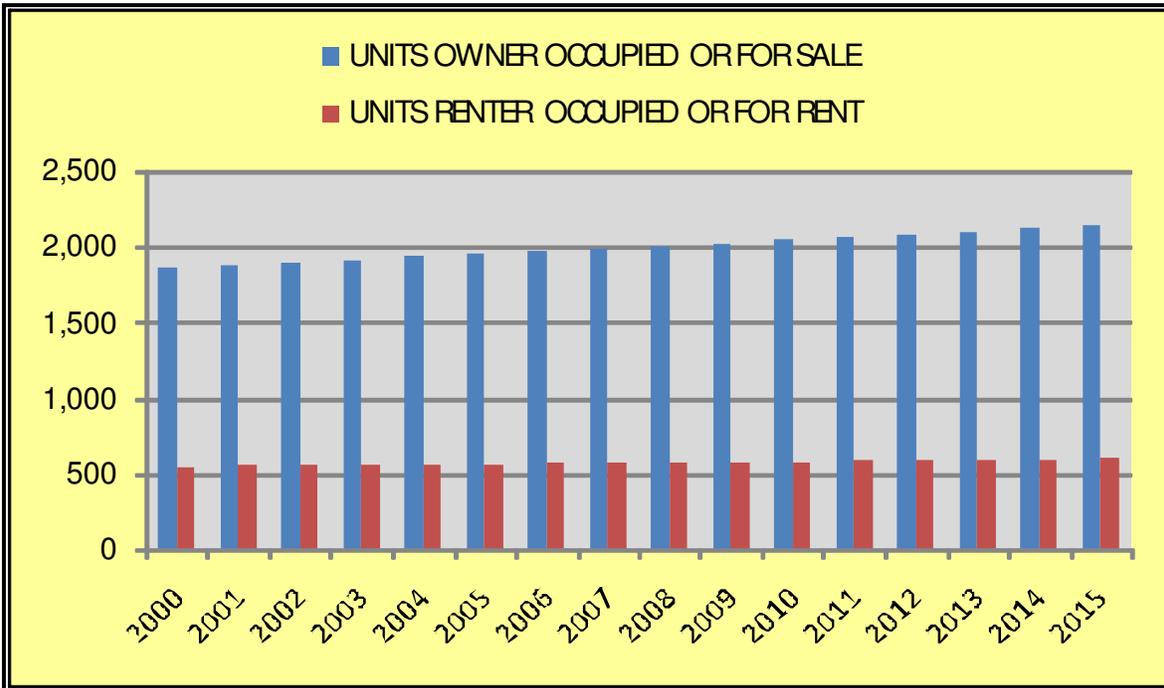
Persons aged 65 or better currently account for approximately 15 percent in the United States. Currently, the residential population within Harpswell has a higher percentage of persons within this age range, and it is expected to rise further as the years pass. The following figure illustrates the Maine State Planning Office’s projected growth in amount of persons based on age group until 2020.

Figure 49: Population Projection by Age



Seasonal population is expected to remain stable for the Town as several factors that influence construction of additional units, such as zoning, wetlands, market influences are limited. The following chart illustrates the projected housing growth for Harpswell, divided by owner-occupied and rental housing.<sup>26</sup>

Figure 50: Housing Projection



It is not the intent of this study to be a definitive authority for the projection of future population in the service area, but rather to base recommendations for future fire protection needs on a reasonable association with projected service demand. Since ESCi knows that the service demand for emergency agencies is based almost entirely on human activity, it is important to have a population-based projection of the future size of the community. While we see variations in the population projections discussed here, one thing that can be certain is that the fire departments in Harpswell will continue to be emergency service providers to a growing population, likely reaching over 6,000 by 2030. Planning should begin now to maintain the resources needed to meet the continuing demand for services.

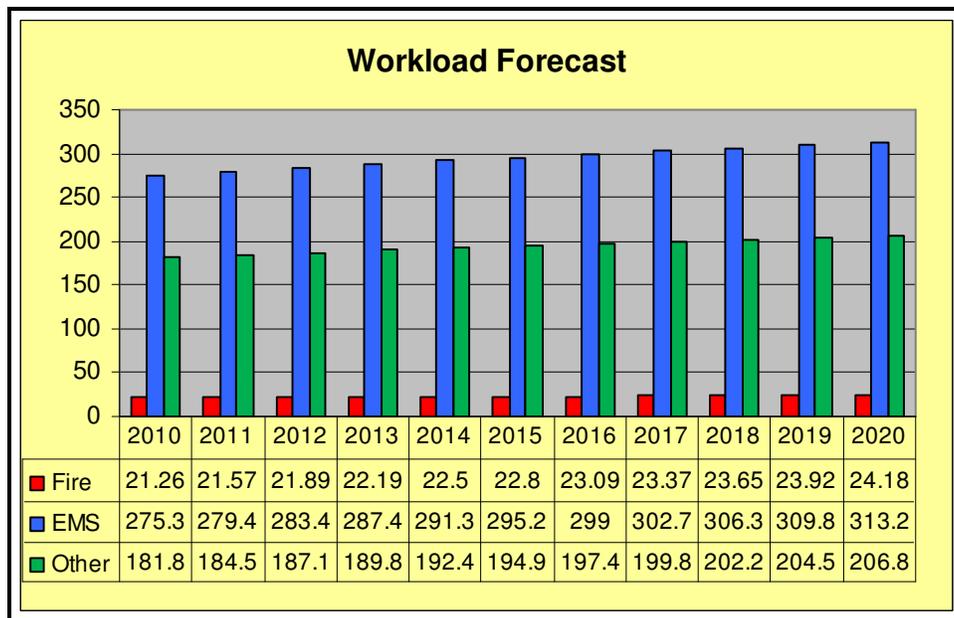
<sup>26</sup> Maine State Planning Office.

In evaluating the deployment of facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance.

For this study, ESCi utilized the population projections presented earlier and multiplied these by a forecasted incident rate derived from incident per capita rates to identify workload potential through the year 2020. It should be noted that this workload projection is for individual incidents rather than unit responses. In other words, an incident is only counted once, even if both a fire apparatus and an ambulance respond. This does not necessarily coincide with the way that the departments have historically counted workload, where a single incident with a fire and ambulance presence is counted as both a fire call and an EMS call. As a result, this projection is for total incidents, many of which may receive both fire and EMS response. It should also be noted that the projection was made from only one year of CAD data, the most recent twelve months available. Given that limitation, we express that the projection has a significant potential margin of error.

Analysis results are shown, by year and type of call, in the following chart and table. This table reflects projected service demand for all fire departments based on projected population within current Town limits.

**Figure 51: Workload Projection**



## Facilities and Vehicles

The Town of Harpswell has volunteer fire departments that need a balance of three basic resources to successfully carry out their emergency mission - specifically people, equipment, and facilities. Because firefighting is an extremely physical pursuit, the adequacy of personnel resources is a primary concern, but no matter how competent or numerous the firefighters are, the department will fail to execute its mission if it lacks sufficient fire apparatus distributed in an efficient manner.

The three departments have been sharing significant capital assets by working together as a team whenever appropriate. These assets are necessary to provide service and must be maintained and replaced as needed. Maintenance and replacement plans should be created and maintained for facilities, apparatus, and other high value equipment.

While volunteer, career, and even combination departments have different facility requirements, there are basic needs each fire station has to address - quick response time and housing of apparatus and equipment. Everything else depends on a particular department's budget and needs. Fire station designs are unlike any other type of project, as there are many subtle elements and specialized systems that go into a fire station.

Inadequate facilities for housing firefighters and apparatus can detract from the department's mission. Limited space can significantly impact the available options for resource assignment, hinder the ability to maintain a well-trained workforce, and may affect volunteer morale. In the case of these departments, the design and construction of the fire stations are suitable for volunteer operations, as they exist today. However, consideration should be given to the ability of the facilities to support the functions and goals of the Town, as it may operate in the future.

The primary functions that should take place within the fire station environment should be closely examined and adequate, efficient space for all functions should be provided. Here are some examples:

- Housing and cleaning apparatus and equipment
- Administrative office duties
- Firefighter training
- Firefighter fitness

- Residential living that is gender compatible for on-duty volunteer members, if such programs are deemed necessary
- Operations that include enough room for community groups and parking

While this list may seem elementary, the lack of dedicated space compromises the ability of the facilities to support any of these functions, and can detract from its primary purpose for existing. At this time, these fire departments operate facilities that may be unable to fully support one or more of the primary functions.

This study reviewed the four fire stations in the Town. The older fire stations have been given some updating, though because of original size and design, they provide for only the basic organizational needs.

An evaluation and general condition assessment was conducted at all four fire stations. It should be noted, however, that this study is not a full facilities assessment as would be conducted by an engineer or architect. Such a study would be far more detailed than the evaluation conducted for this report. Each fire company should consider the recommendations of an architect or engineering study as final authority in issues of condition and need. This focus is on operational conditions, efficiency, safety, and staff and apparatus space needs.

In similar fashion, each piece of apparatus was given a basic review for condition and safety. The following paragraphs describe any notations made during this review. The apparatus condition ratings utilized by ESCi are provided below.

**Excellent:**

Like new condition. No body or paint defects. Clean compartmentation. Interior, cab complete and in full working order with no modifications. No significant defect history. Age is less than 25% of life expectancy.

**Good:**

Body and cab have good appearance with no rust and only minor cosmetic defects or dents. Clean compartmentation with no visible rust or corrosion. Interior, cab are in full working order and good appearance. Normal maintenance history with no significant defects or high downtime. Age is less than 75% of life expectancy.

**Fair:**

Body and cab have weathered appearance with minor surface rust and some cosmetic defects or dents. Unimpeded compartmentation with only surface rust or corrosion. Interior, cab are in reasonable working order and appearance. Only repairable tank or plumbing leakage. Showing increasing age-related maintenance, but with no major defects or unreasonable downtime. Age is less than 100% of life expectancy.

**Serviceable:**

Body and cab have weathered appearance with surface corrosion, cosmetic defects or dents, and minor rust-through of non-structural metals (body panels). Unimpeded compartmentation with significant surface rust or corrosion and/or minor rust-through (not affecting use). Interior, cab are in rough, but working order, often with local repairs or modifications to compensate for problems. Occasional or intermittent tank or plumbing leakage. Showing increasing age-related maintenance, but with no major defects or unreasonable downtime. Most service parts still available. Age is greater than 100% of life expectancy.

**Poor:**

Body and cab have weathered appearance with surface corrosion, cosmetic defects or dents, and visible rust-through of non-structural metals (body panels). Significant rust or corrosion is present in structural or support members. Use of compartmentation is impeded with significant corrosion and rust-through. Interior, cab are in rough condition with defects impeding safe and proper use. Unrepairable tank or plumbing leakage. Problematic age-related maintenance, major defects or unreasonable downtime are evident. Service parts difficult or impossible to obtain. Age is greater than 100% of life expectancy. Vehicle exceeds its GVWR.

**Cundy's Harbor Volunteer Fire Department**



**Cundy's Harbor**

837 Cundy's Harbor Road

*Built in 1955, this modest two-story, 6,200 square foot facility consists of four apparatus bays. This is a multi-use community building in a quiet residential neighborhood with the fire station and apparatus bays occupying the lower level.*

*Any specific issues or observations with this facility can be classified into the following seven categories.*

<ul style="list-style-type: none"> <li>• Design:</li> </ul>	<p><i>Building has undergone several expansions and/or changes since origin. Community hall is maintained upstairs and available for public rental or events. Downstairs is very basic fire station with limited staff areas. Facility is adequate for current use, but would need renovation to accommodate on-duty staffing. Building blends well with surrounding community.</i></p>
<ul style="list-style-type: none"> <li>• Construction:</li> </ul>	<p><i>Masonry block and wood frame with a pitched, shingle roof. Apparatus bays are beneath a large community meeting hall. Part of the foundation integrates solid rock bluff material. Forced air, fuel oil heating system. No air conditioning. Building is in relatively good condition with no major maintenance issues reported.</i></p>
<ul style="list-style-type: none"> <li>• Safety:</li> </ul>	<p><i>Building is sprinklered. Challenges to sight distance toward north. Commercial cooking equipment present, inspections are current. Fire alarm systems in place and monitored. No back-up generator.</i></p>
<ul style="list-style-type: none"> <li>• Environment:</li> </ul>	<p><i>No apparatus exhaust removal system present: highly recommended due to assembly occupancy above. No other environmental issues noted.</i></p>
<ul style="list-style-type: none"> <li>• Code Compliance:</li> </ul>	<p><i>Upstairs hall is ADA compliant, downstairs fire station is likely not compliant. Exposed electrical wiring/junctions in rear of bay. No other issues noted. Status of fire separation between apparatus bays and assembly occupancy undetermined, but likely accomplished through presence of sprinklers.</i></p>
<ul style="list-style-type: none"> <li>• Staff Facilities:</li> </ul>	<p><i>Adequate space for working on and around apparatus. Adequate space for cooking and eating if upstairs areas are used. Assembly area can be used for meetings and classroom. No showers or sleeping quarters in facility, could accommodate temporary housing in disaster mode only.</i></p>
<ul style="list-style-type: none"> <li>• Efficiency:</li> </ul>	<p><i>No interior passage between downstairs and upstairs, requires exit from building. Building is large enough for future fire department expansion of staff areas, but would need significant renovation and would require other community accommodations of current public uses.</i></p>

## Apparatus



### CHVFD Engine 1

#### **1997 International Valley Pumper**

Seating Capacity: 2  
Pump Capacity: 1,250  
Tank Capacity: 1,000  
Condition: **Fair/Good**  
Mileage: 8,729

**Additional Comments or Observations:** Top-mount pump. Aluminum body, scheduled for repainting. Auto snowchains. Compressed air class A foam system. Surface corrosion and corrosion inside compartments, on vehicle frame, and on springs.



### CHVFD Tanker 1

#### **1991 Ford Valley Tanker**

Seating Capacity: 2  
Pump Capacity: 500  
Tank Capacity: 1,800  
Condition: **Fair/Good**  
Mileage: 9,646

**Additional Comments or Observations:** Pump replaced five years ago. Inefficient 8" circular dump valve. 35' and 20' ladder on board. 2,100 gallon dump tank. Corrosion present on frame and springs. Surface rust present. Rust in door frames. Given size of tank, presence of ladders, vehicle should be weighed and checked against GVWR.



### CHVFD Squad 1

#### **2003 Ford E-One Service Truck**

Seating Capacity: 2  
Pump Capacity: **NA**  
Tank Capacity: **NA**  
Condition: **Excellent**  
Mileage: 5,429

**Additional Comments or Observations:** Equipped with 175gpm portable pump and 3KW portable generator. Multiple SCBA units. Cold water/ice rescue suits. Raven 5KW engine-driven generator system.



**CHVFD EMS 1**

***1999 Ford McCoy-Miller Ambulance***

Seating Capacity: 2  
Pump Capacity: **NA**  
Tank Capacity: **NA**  
Condition: **Serviceable**  
Mileage: **19,554**

***Additional Comments or Observations:*** No issues noted.

**Harpswell Neck Fire and Rescue**



**Harpswell Neck  
1426 Harpswell Neck Road**

*Built in 1950, this older, two-story, 6,132 square foot facility consists of four apparatus bays. This is a fairly old facility that has undergone several renovations and additions. It is located in a quiet rural neighborhood. Any specific issues or observations with this facility can be classified into the following seven categories.*

<ul style="list-style-type: none"> <li><b>Design:</b></li> </ul>	<p><i>This building was not originally designed for current capacity and use, but has been reasonably expanded in various phases. Blends well with surrounding area. Lot size and location provide opportunity for further adaptability to future needs. Not currently designed for on-duty staffing. Limited paved parking.</i></p>
<ul style="list-style-type: none"> <li><b>Construction:</b></li> </ul>	<p><i>Partial wood and partial steel frame. Part pitched roof, part flat rubberized roofing. Has had two major additions. Fuel oil, forced air heating system. No air conditioning. Some renovation of kitchen and turnout gear room currently underway.</i></p>
<ul style="list-style-type: none"> <li><b>Safety:</b></li> </ul>	<p><i>Limited sight distances, particularly to right of apparatus exit. Local smoke detection only, no security alarms. Building is not sprinklered. Flammable or combustible liquids not in approved storage cabinet. Propane back-up generator present with auto transfer.</i></p>
<ul style="list-style-type: none"> <li><b>Environment:</b></li> </ul>	<p><i>Passive air flow exhaust removal system in place. No oil separator in floor drains. No other issues noted</i></p>
<ul style="list-style-type: none"> <li><b>Code Compliance:</b></li> </ul>	<p><i>Building does not appear to have rated fire separations between apparatus bays and staff areas/offices. Does not appear to be ADA compliant due to door and bathroom hardware and lack of 2nd floor accessibility.</i></p>
<ul style="list-style-type: none"> <li><b>Staff Facilities:</b></li> </ul>	<p><i>Building is cramped, with inadequate space for working on or around certain apparatus. Considerable clutter and open storage in bays add to problem. Adequate space for cooking and eating. Facility is adequate for on-call responder use, but is not designed for on-duty staffing or 24-hour occupancy. One dual gender bathroom only, shower is in a utility room.</i></p>
<ul style="list-style-type: none"> <li><b>Efficiency:</b></li> </ul>	<p><i>Rear storage area where antique truck is located is cluttered with significant storage of old, outdated or unuseable equipment. This area could be much better used and might accommodate storage of some items currently cluttering the apparatus bays.</i></p>

## Apparatus



### **HNFR Engine 1**

#### ***2006 HME Ferrara Pumper***

Seating Capacity: **6**  
Pump Capacity: **1,500**  
Tank Capacity: **750**  
Condition: **Excellent**  
Mileage: **3,787**

***Additional Comments or Observations:*** Aluminum body/poly tank. Compressed air class A foam w/ 30 gallon tank. 150 psi foam compressor is computer controlled. 8KW hydraulic generator w/ 4,500 watt command light tower. Auto snowchains. Low approach angle between bumper and front tires could pose problem on local streets and paths. This vehicle's accessibility to all local and mutual aid streets should be verified.



### **HNFR Engine 2**

#### ***1990 Ford FMC Pumper***

Seating Capacity: **2**  
Pump Capacity: **1,000**  
Tank Capacity: **1,000**  
Condition: **Fair**  
Mileage: **15,925**

***Additional Comments or Observations:*** 2.2KW gas generator in non-vented compartment. Some minor surface rust and corrosion on frame. Cracked compartment hinges. Floor rust on compartments. Very limited compartmentation.



### **HNFR Tanker 1**

#### ***2004 International Greenwood Tanker***

Seating Capacity: **2**  
Pump Capacity: **500**  
Tank Capacity: **1,800**  
Condition: **Good**  
Mileage: **2,400**

***Additional Comments or Observations:*** This is a refurbished truck by EVM with a new chassis. Steel tank. 10" electric three-way dump valve. Back-up camera system. Auto snowchains. Carries portable pump and 2,100 gallon dump tank. Well designed for water shuttle.



### **HNFR Tanker 2**

#### ***1986 GM EVM Tanker***

Seating Capacity: 2  
Pump Capacity: 500  
Tank Capacity: 1,750  
Condition: **Serviceable/Good**  
Mileage: 69,339

***Additional Comments or Observations:*** Body and tank manufactured in 2004 in good condition, placed on older used chassis in serviceable condition. Polycarbonate body. Auto snowchains. 500 gpm portable pump can be disconnected and removed by on-board electric crane. Carries 2,100 gallon dump tank.



### **HNFR Utility 1**

#### ***2008 Dodge 3500 4x4 Utility Unit***

Seating Capacity: 4  
Pump Capacity: 200  
Tank Capacity: 225  
Condition: **New**  
Mileage: **New**

***Additional Comments or Observations:*** Skid mount pump/tank to be installed and removeable for wildland fire seasons. Winch and plow available.



### **HNFR EMS 1**

#### ***2004 Ford AEV Ambulance***

Seating Capacity: 2  
Pump Capacity: **NA**  
Tank Capacity: **NA**  
Condition: **Excellent**  
Mileage: 10,095

***Additional Comments or Observations:*** Equipped with power stretcher lift and automatic snow chain system.

**Orr’s and Bailey Islands Fire Department**



**Bailey Island**  
**2094 Harpswell Islands Road**

*Built in 2001, this small, low-key single story, 1200 square foot facility consists of two apparatus bays. This is a very small, conservative building with a professional appearance on a tiny lot in a quiet mixed-use area.*

*Any specific issues or observations with this facility can be classified into the following seven categories.*

<ul style="list-style-type: none"> <li>• <b>Design:</b></li> </ul>	<p><i>The facility is a simple design intended primarily to accomodate apparatus parking only. As such, it is adequate for that intended use and blends well with surrounding area, but is not adaptable to expansion or on-duty staffing. No staff areas are present. Limited parking.</i></p>
<ul style="list-style-type: none"> <li>• <b>Construction:</b></li> </ul>	<p><i>Wood frame with a pitched, shingle roof. Gas fueled, forced air heating system. No air conditioning. Newer facility in good condition. Lot is equipped with an underground 38,000 gallon water cistern for area fire supply.</i></p>
<ul style="list-style-type: none"> <li>• <b>Safety:</b></li> </ul>	<p><i>Building is not sprinklered. No local or monitored fire or security alarms. No back-up generator.</i></p>
<ul style="list-style-type: none"> <li>• <b>Environment:</b></li> </ul>	<p><i>Underground propane storage tank with pressure guage as primary leak detection. No apparatus exhaust removal system present, but would have limited applicability due to lack of staff areas.</i></p>
<ul style="list-style-type: none"> <li>• <b>Code Compliance:</b></li> </ul>	<p><i>Building is not likely ADA compliant due to door hardware.</i></p>
<ul style="list-style-type: none"> <li>• <b>Staff Facilities:</b></li> </ul>	<p><i>Adequate space for working on and around apparatus. No staff facilities present. No bathrooms or running water. Facility is for apparatus parking only and is not readily adaptable to other uses.</i></p>
<ul style="list-style-type: none"> <li>• <b>Efficiency:</b></li> </ul>	<p><i>Lack of bathrooms. Although the transport ambulance is not run out of this facility, proper facilities for decontamination should be avialable for firefighters who respond to assist at a medical call, vehicle accident, or similar incident. Building has limited use as apparatus parking only.</i></p>

	<p><b><u>Orr's Island</u></b>  <b>1600 Harpsell Islands Road</b>  <i>Built in 1987, this two-story, 6240 square foot facility consists of three apparatus bays. The fire department property is rather large, with a three-building complex in a quiet rural area that includes a renovated historic school building.</i>  <i>Any specific issues or observations with this facility can be classified into the following seven categories.</i></p>
	<p><i>Orr's Island Station          Historic Renovated Schoolhouse</i></p>
	<p><i>Orr's Island Station          Additional storage/apparatus building</i></p>
<ul style="list-style-type: none"> <li>• <b>Design:</b></li> </ul>	<p><i>All buildings are modest and well-kept with a pleasant appearance that blends well with the surrounding area. The fire station is adequately sized for current use and adaptable to future needs. Adequate parking. The historic schoolhouse has been renovated for use as a public community building and is available for use by the fire department for training, or by the public for a rental hall. Third building is for future apparatus bay with useable staff area above.</i></p>
<ul style="list-style-type: none"> <li>• <b>Construction:</b></li> </ul>	<p><i>Wood frame with a pitched, shingle roof. Fuel oil, forced air heating system. No air conditioning. Facility in good condition.</i></p>
<ul style="list-style-type: none"> <li>• <b>Safety:</b></li> </ul>	<p><i>Limited sight distances to both left and right of apparatus exit. Building is not sprinklered. Automatic door stops not present or operating. Local smoke detection only, no security alarms. Flammable or combustible liquids not in approved storage cabinet. Propane back-up generator present with auto transfer.</i></p>
<ul style="list-style-type: none"> <li>• <b>Environment:</b></li> </ul>	<p><i>No apparatus exhaust removal system present. No other environmental issues noted.</i></p>
<ul style="list-style-type: none"> <li>• <b>Code Compliance:</b></li> </ul>	<p><i>Fire station is not likely ADA compliant due to door hardware and 2nd floor access. No rated fire separation between apparatus bay and staff areas. Fueling facility inside structure. Public use schoolhouse building appears to be ADA compliant.</i></p>

<ul style="list-style-type: none"> <li>• <b>Staff Facilities:</b></li> </ul>	<p><i>Building is designed for on-call responders only. Would need modification for on-duty or 24-hour staffing. One dual-gender bathroom only. Third building could someday accommodate additional staff areas upstairs.</i></p>
<ul style="list-style-type: none"> <li>• <b>Efficiency:</b></li> </ul>	<p><i>Building and bays are crowded by significant amounts of old, outdated equipment or supplies, much of which was described as surplus. Elimination or sale of surplus material could free up significant amounts of space around the station and equipment.</i></p>

**Apparatus**



**OBIFD Engine 1**

***1991 Ford Central Pumper***

Seating Capacity: 2  
 Pump Capacity: 1,000  
 Tank Capacity: 1,000  
 Condition: **Good**  
 Mileage: 11,084

***Additional Comments or Observations:*** Top-mount pump. No generator. Surface corrosion on treadplates.



**OBIFD Engine 2**

***1982 GMC American LaFrance Mini-pumper/Wildland Unit***

Seating Capacity: 2  
 Pump Capacity: 250  
 Tank Capacity: 250  
 Condition: **Poor**  
 Mileage: 5,973

***Additional Comments or Observations:*** Gas engine. Water tank leaks with several patches. Rust on body, door frames. Rust on vehicle frame. Springs appear fatigued. Approved for replacement during fiscal year 2008.



**OBIFD Engine 3**

***2000 GMC EVM Pumper***

Seating Capacity: 2  
Pump Capacity: 1,000  
Tank Capacity: 1,000  
Condition: **Good**  
Mileage: 5,879

***Additional Comments or Observations:*** Top-mount pump. Compressed air class A foam system. 5kw portable generator. Thermal imaging camera on board. Slight surface corrosion noticed.



**OBIFD Tanker 1**

***1985 GMC Valley Tanker***

Seating Capacity: 2  
Pump Capacity: 350  
Tank Capacity: 1,425  
Condition: **Fair**  
Mileage: 6,564

***Additional Comments or Observations:*** Steel tank and body replaced around 1990. Pump was from 1960 truck. Three 10" dump valves. 2100 gallon dump tank. Two-speed rear axle challenging to new drivers. Some light rust/corrosion on frame. Surface rust on body.



**OBIFD Utility 2**

***2002 Chassis/2004 Body GMC EVM Service Truck***

Seating Capacity: 6  
Pump Capacity: **NA**  
Tank Capacity: **NA**  
Condition: **Excellent**  
Mileage: 2,399

***Additional Comments or Observations:*** Equipped with cascade SCBA fill station, hydraulic 15KW generator, 30' light tower, portable pumps, Kinman extrication system w/ portability, radio command center.



**OBIFD EMS 1**

***1995 Ford MedTec Ambulance***

Seating Capacity: **2**  
Pump Capacity: **NA**  
Tank Capacity: **NA**  
Condition: **Serviceable**  
Mileage: **39,033**

***Additional Comments or Observations:*** Equipped with Zoll monitor.

**Recommendations:**

- Develop a program to replace vehicles through the recommended capital improvement plan funded by the Town.
- Develop specifications for new apparatus based on specific Town needs and condition of community streets and access ways.
- Begin purchasing apparatus through a collaborative effort and competitive bid process.

## Vehicle Replacement Schedule

The figure below represents the fire departments' capital plan request that initiated this study.

Figure 52: Fire Department Proposed Capital Improvement Plan

Vehicle	Department	Replace or Remount	Model Year to be Replaced	Typical Life	Estimated Remaining Life	Estimated Cost (in 2006 dollars)	Total for Year (in 2006 dollars)	Year Needed
Brush Truck	OBIFD	Replace	1982	20	None	120,000	120,000	2007
Ambulance	OBIFD	Replace	1995	10	None	130,000	130,000	2008
Tanker	OBIFD	Replace	1985	20	None	180,000	490,000	2009
Ambulance	CHVFD	Replace	1999	10	2	130,000		
Tanker	HNFR	Remount	1988	20	2	180,000		
Pumper	HNFR	Replace	1990	20	3	350,000	350,000	2010
Tanker	CHVFD	Replace	1991	20	4	180,000	180,000	2011
Pumper	OBIFD	Replace	1992	20	5	350,000	350,000	2012
Ambulance	HNFR	Replace	2004	10	7	130,000	130,000	2014
Pumper	CHVFD	Replace	1997	20	15	350,000	350,000	2017
Ambulance	OBIFD	Replace	2009	10		130,000	130,000	2018
Ambulance	CHVFD	Replace	2009	10		130,000	130,000	2019
Pumper	OBIFD	Replace	2000	20	13	350,000	350,000	2020
Squad	CHVFD	Replace	2003	20	16	120,000	120,000	2023
Utility/Rescue	OBIFD	Replace	2004	20	17	250,000	560,000	2024
Tanker	HNFR	Replace	2004	20	17	180,000		
Ambulance	HNFR	Replace	2014	10		130,000		
Pumper	HNFR	Replace	2027	20	20	350,000	470,000	2027
Brush Truck	OBIFD	Replace	2007	20		120,000		
<b>Total</b>						<b>3,860,000</b>	<b>3,860,000</b>	

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In a recent White Paper produced by the Fire Apparatus Manufacturer’s Association, the authors surveyed 1,200 fire chiefs from across the country in regards to apparatus condition and usage in an attempt to identify optimum usage and replacement criteria. Of those who responded to the survey, 45 percent were volunteer organizations and 82 percent were serving populations less than 50,000. Of the total, 48 percent identified themselves as rural. The information in the figures below is an excerpt from that report, specifically focusing on rural volunteer departments.<sup>27</sup>

**Figure 53: Average Apparatus per Department by Type**

<b>Apparatus Type</b>	<b>Average</b>
Pumper/Engine	5.8
Aerial	1.5
Rescue	2.5

**Figure 54: Estimated Life Expectancy (Active Service)**

<b>Apparatus Type</b>	<b>Average</b>
Pumper/Engine	18
Aerial	21
Rescue	16

**Figure 55: Estimated Life Expectancy (Reserve Service)**

<b>Apparatus Type</b>	<b>Average</b>
Pumper/Engine	14
Aerial	13
Rescue	11

**Figure 56: Estimated Total Service Life (Rural Department)**

<b>Apparatus Type</b>	<b>Average</b>
Pumper/Engine	32
Aerial	34
Rescue	27

This information corresponds to call volumes as indicated below. Call volume significantly below the noted averages would tend to lengthen the average service life of all vehicles. The departments do not currently have the capacity to maintain reserve apparatus; therefore, the total life expectancy of an engine is calculated using the active service life. Tankers were not

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<sup>27</sup> Lackore, Roger. *Fire Apparatus Duty Cycle White Paper*. Fire Apparatus Manufacturer’s Association, Technical Committee. August 10, 2004.

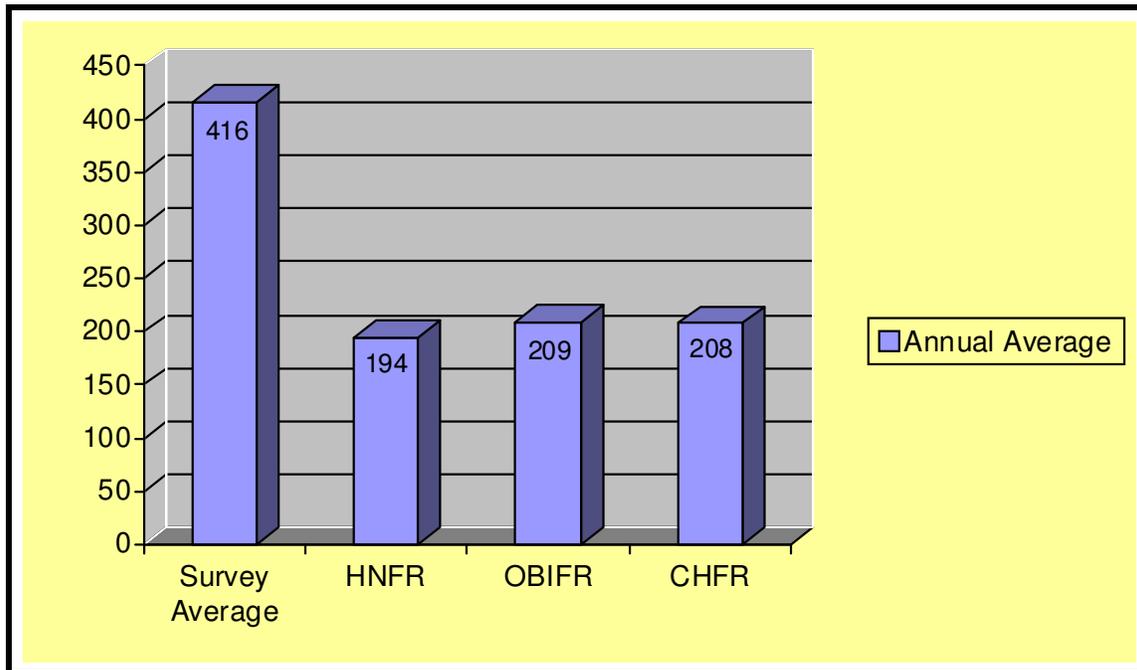
evaluated in the reference white paper so an average life expectancy of 20 years was utilized based on the lower call volumes and limited annual mileage typically experienced with tanker utilization.

**Figure 57: Average Annual Call Volume for Survey Respondents of Newest Primary Apparatus**

Apparatus Type	Average
Pumper/Engine	780
Aerial	520
Rescue	832

The figure below illustrates the call volumes of the three Harpswell departments in comparison to those responding to the survey discussed above. Although Figure 57 notes average annual call volume of only the newest primary apparatus, the ‘Survey Average’ column noted in Figure 58 represents the annual average of only rural departments that participated in the replacement criteria study, excluding urban and suburban departments for purposes of comparison.

**Figure 58: Average Annual Call Volume Apparatus Survey Comparison**



Unfortunately, the referenced study only surveyed departments in regards to fire apparatus. Life expectancy of ambulances is usually less difficult to gauge as most departments utilize a mileage trigger rather than a vehicle age. Of course, other factors such as serviceability, overall

reliability, and appearance should be taken into consideration when determining when to replace an EMS vehicle.

Although mileage is the most reliable factor, there is some debate as to what mileage should trigger replacement. In most urban areas, services begin to consider replacement at mileages as low as 65,000 miles based on overall condition of the vehicle. In rural and suburban areas, that trigger mileage can reach as high as 200,000 before moving the vehicle to a reserve status.

Another factor to consider is trade-in value of the vehicle. If a vehicle that is scheduled to be replaced is planned for trade, the value of vehicle tends to trail off dramatically after approximately 80,000 miles. Whether or not to take this into consideration is a decision to be made by the department.

According to the National Association of Emergency Medical Technicians (NAEMT) 32.5 percent of the nation's EMS personnel work in a *small town* environment, while another 21.6 percent function within rural areas. This accounts of 54.1 percent of the total EMS profession. The Town, although an incorporated municipality, is still considered rural in its delivery of emergency services.

In regards to the fire and EMS apparatus within the Harpswell area, the average apparatus age is 11.625 years with an average mileage of 14,389. The information provided is intended to illustrate national trends and is in no way presented here as a standard to equipment replacement. When considering replacement of capital equipment, organizations must bear in mind the typical vehicle usage, climate factors that may shorten life expectancy, and overall maintenance issues that tend to increase as vehicles age.

With this in mind, the following figure is offered as a recommended replacement schedule for all current apparatus within the three departments serving Harpswell. This schedule varies slightly from that presented by the fire departments, and does so in consideration of the factors discussed. While this recommendation has a slightly more aggressive replacement schedule, total cost is lower due to utilization of commercial vehicles rather than custom apparatus for the reasons discussed later.

**Figure 59: Recommended Capital Replacement Schedule**

<b>UNIT</b>	<b>MODEL YEAR</b>	<b>REPLACEMENT COST</b>	<b>CURRENT AGE</b>	<b>LIFE EXPECTANCY</b>	<b>REPLACEMENT YEAR</b>
OBI Tanker 1	1985	\$ 210,000	23	20	2005
OBI EMS 1	1995	\$ 115,000	13	10	2005
HN Tanker 2	1986	\$ 210,000	22	20	2006
HN Engine 2	1990	\$ 250,000	18	18	2008
OBI Engine 1	1991	\$ 250,000	17	18	2009
CH EMS 1	1999	\$ 115,000	9	10	2009
CH Tanker 1	1991	\$ 210,000	17	20	2011
HN EMS 1	2004	\$ 115,000	4	10	2014
CH Engine 1	1997	\$ 250,000	11	18	2015
OBI Engine 3	2000	\$ 250,000	8	18	2018
CH Squad 1	2003	\$ 140,000	5	15	2018
OBI EMS 1	2008	\$ 115,000	N/A	10	2018
HN Utility 1	2007	\$ 40,000	1	12	2019
CH EMS 1	2009	\$ 115,000	N/A	10	2019
OBI Utility 2	2004	\$ 275,000	4	15	2019
OBI Engine 2	2008	\$ 140,000	N/A	15	2023
HN EMS 1	2014	\$ 115,000	N/A	10	2024
HN Engine 1	2006	\$ 250,000	2	18	2024
HN Tanker 1	2004	\$ 210,000	4	20	2024
OBI EMS 1	2018	\$ 115,000	N/A	10	2028
CH EMS 1	2019	\$ 115,000	N/A	10	2029
HN EMS 1	2024	\$ 115,000	N/A	10	2034
<b>TOTALS</b>		<b>\$ 3,720,000</b>			

Based on ESCi’s observations of current apparatus age and condition, and the recommendation to follow an engine replacement schedule of 18 years, the figure is ordered such that the older apparatus needs are presented first, followed by subsequent years of capital replacement. It should be noted that, in no way, does ESCi believe that the current apparatus are unsafe or unable to perform as needed. We realize that the recommended replacement schedule could potentially place a significant financial burden on the Town and the primary apparatus replacements could be spread over several years to lessen the initial financial impact. Given the serviceable condition of the current apparatus, this would be acceptable, though ESCi continues to recommend that the Town move towards a more consistent replacement schedule of 18 to 20 years for engines, 20 years for tankers, and 10 years for ambulances.

ESCi has considered the alternatives and believes that it is in the best interest of the Town to enter into an agreement to fund capital replacement of vehicles for the departments. We suggest that the following be included in any such agreement.

**Recommendations:**

- The Town should enter into an agreement with the fire departments to purchase capital vehicles that meet the Town's needs.
- The Town should maintain ownership of all vehicles purchased with public funds.
- The Town should appoint a capital replacement committee consisting of fire department representatives, as well as elected officials for balance.
- The vehicle committee should determine specifications for all vehicle purchases.
- The Town should develop consistency among the departments in regards to the types of vehicles purchased and the equipment to be included in the vehicle purchase, considering individual department needs.
- Approval of specifications should rest with the Town Selectmen.
- The Town should purchase equipment through a competitive bid process.

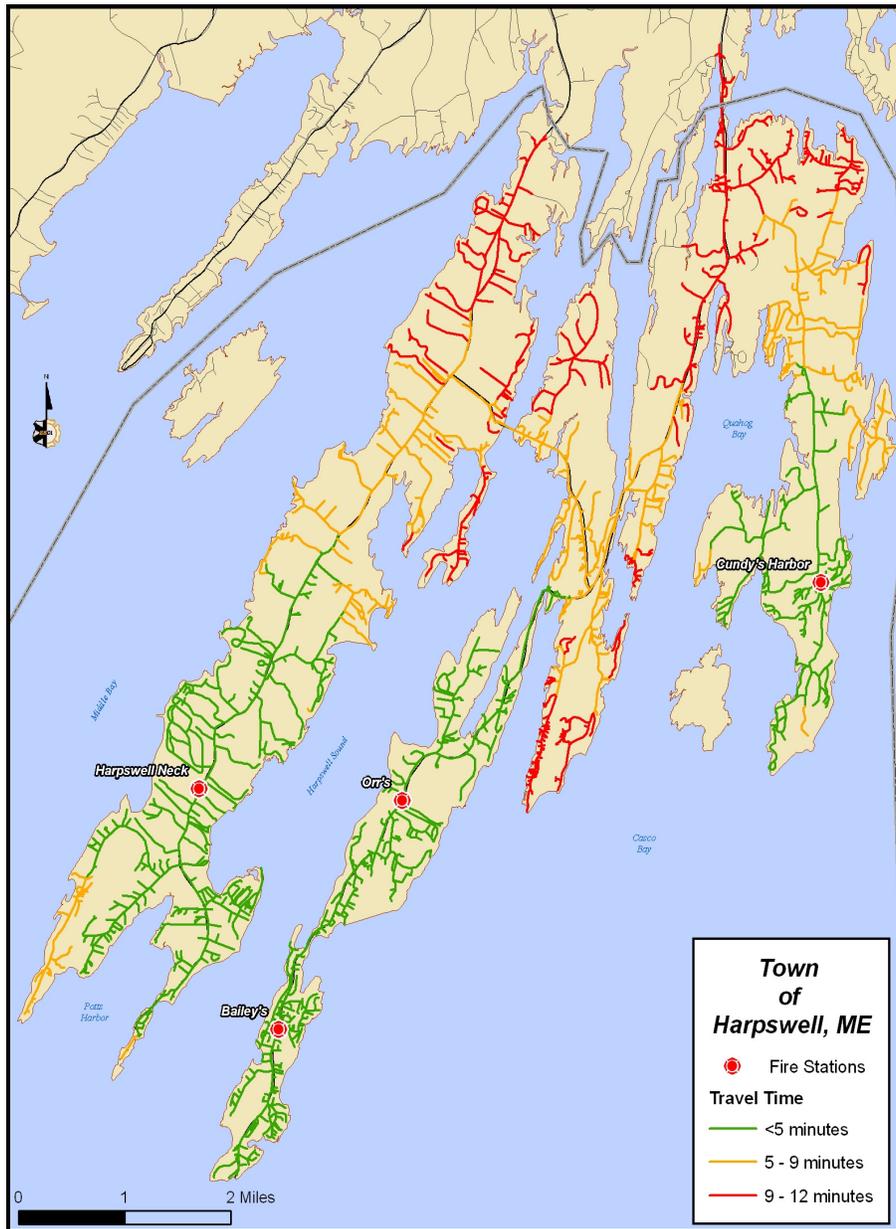
These recommendations are based on ESCi's observations during field visits to the Harpswell area. Although the primary roadways are adequate, many of the residential streets are too narrow for fire apparatus that has extended front bumpers and large turning radii.

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## Future Deployment Strategies

Under most circumstances, this portion of a report would focus on relocation of facilities or redeployment of apparatus to better cover the jurisdiction. In the case of Harpswell, the current station locations are located appropriately based on historical service demand and are able to cover a large portion of their respective response areas within a five to nine minute travel time, as indicated on the figure below.

Figure 60: Travel Time from Stations



## Town of Harpswell, Maine – Fire and Rescue Services Study

The areas highlighted in red on the previous figure are areas that can be reached within nine to 12 minutes from current station locations. Based on the travel time of Brunswick Fire Department depicted on the following figure, Harpswell and the three volunteer departments would be served well by entering into an inter-local government agreement for Brunswick to provide service to the extreme northern sections of the town. In the alternative, a fifth station would be necessary on the north end of Harpswell Neck, as well as a sixth station north of Cundy's Harbor, both to maintain responses within five to nine minutes.

**Figure 61: Brunswick Fire Department Travel Time**



If, however, the Town and the volunteer departments are satisfied with their current ability to respond to nearly all areas of the Town within nine to twelve minutes, no additional stations would be necessary.

Likewise, the current equipment deployed throughout the Town is adequate for the current service demand, and ESCi does not see dramatic changes in the future that would alter the need for additional apparatus. The Town has a height restriction of 30 feet and, while there may be existing structures that exceed that limit, no future structures are likely to be built exceeding the 35 foot height threshold<sup>28</sup> that would ultimately lead to the need for deployment of an aerial truck company.

**Recommendation:**

- Based on the travel time of Brunswick Fire Department, the Town should consider entering into an inter-local government agreement for Brunswick to provide *first-due* service to the extreme northern sections of the Town.

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<sup>28</sup> Insurance Services Office Public Protection Classification criteria discuss earlier in the report.

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## Staffing

Fire and emergency medical services (EMS) organizations must provide adequate staffing in three key areas - emergency services, administration, and support. ESCi surveyed the fire departments to assure that a reasonable balance between the three areas is maintained, given the realities of available local resources.

Several standards address staffing issues. Specifically, the *OSHA Respiratory Protection Standard 29 CFR 1910. 134*, *NFPA 1710: Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, and *NFPA 1720: Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* are frequently cited as authoritative documents. In addition, the Center for Public Safety Excellence (CPSE) publishes benchmarks for the number of personnel required on the emergency scene for various levels of risk.<sup>29</sup>

Each emergency service department provides fire suppression using a distinctively individual staffing system to accomplish its mission and responsibilities to its constituents. However, there are some similarities that exist in the administrative functions. In the three organizations, staffing for emergency response to fire, emergency medical, and related incidents is provided with all volunteer personnel.

### **Administration and Support Staff**

One of the primary responsibilities of a department's administration and support staff is to ensure that the organization's operational entities have the ability and means to accomplish their responsibilities on the emergency incident. Efficient and effective administration and support are critical to the department's success. Without sufficient oversight, planning, documentation, training, and maintenance, the department's operational entities will fail any operational test. Additionally, like any other part of a fire department, administration and support require appropriate resources to function properly.

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<sup>29</sup> CPSE: formerly the Commission on Fire Accreditation International (CFAI).

The three departments protecting Harpswell do not employ full-time paid personnel at either the administrative or support positions and each department delegates various responsibilities to the chief officers and captains within the respective departments. For this study, there is no need to evaluate the ratio of administrative and support personnel to the total positions of the three departments individually.

The next figure is a summary of the administrative and support personnel by rank for the fire departments serving Harpswell.

**Figure 62: Summary Table of Administrative and Support Personnel**

	<b>CHRF</b>	<b>HNFR</b>	<b>OBIFD</b>
Fire Chief	1	1	1
Assistant Fire Chief	1	1	1
Rescue Chief/Captain	1	1	1
Assistant Rescue Chief/Captain	1	1	0
Training Officer	1	1	1
<b>Total Administrative and Support</b>	<b>5</b>	<b>5</b>	<b>4</b>

**Emergency Service Staff**

***Services Provided***

The following table provides a summary of the emergency services provided by the three departments serving the Town.

**Figure 63: Emergency Services Summary Table**

<b>Services Provided</b>	<b>Cundy’s Harbor Fire and Rescue</b>	<b>Harpswell Neck Fire and Rescue</b>	<b>Orr’s – Bailey Islands Fire and Rescue</b>
Fire Suppression	Yes	Yes	Yes
EMS/Rescue, First Response	Yes	Yes	Yes
EMS, Advanced Life Support	Yes, transport (I)	Yes, transport (I)	Yes, transport (I)
Specialized Rescue	Yes	Yes	Yes
Fire Prevention Inspections	No	No	No
Public Education	Limited	Limited	Limited
Hazardous Materials Response (level)	Awareness	Awareness*	Awareness*

\*Some members have obtained Hazardous-Materials Operations level

Although the table above indicates that none of the three study departments perform fire prevention inspections and public education, all three department do perform these services in a limited capacity. The Town has not adopted any specific building or fire codes for the local departments to enforce, however, some inspections are conducted for homeowners, local businesses, and insurance companies on an *as requested* basis. In regards to public education, no formal programs are in place, but demonstrations and fire safety classes are conducted by request at West Harpswell School, Kellogg Church Day Care Center, and other locations as needed.

It takes an adequate and well trained staff of emergency responders to put the appropriate emergency apparatus and equipment to its best use in mitigating incidents. Insufficient staffing at an operational scene decreases the effectiveness of the response and increases the risk of injury to all individuals involved. The number of operational personnel maintained by a fire department provides some measure of the ability of the department to assemble emergency workers to respond to requests for assistance.

**Staffing Summary**

All Harpswell area fire departments utilize volunteer staffing to carry out their functions. All administrative, support, and response personnel are volunteers. The following figure shows the distribution of emergency personnel by rank and/or role.

**Figure 64: Staffing Summary by Rank**

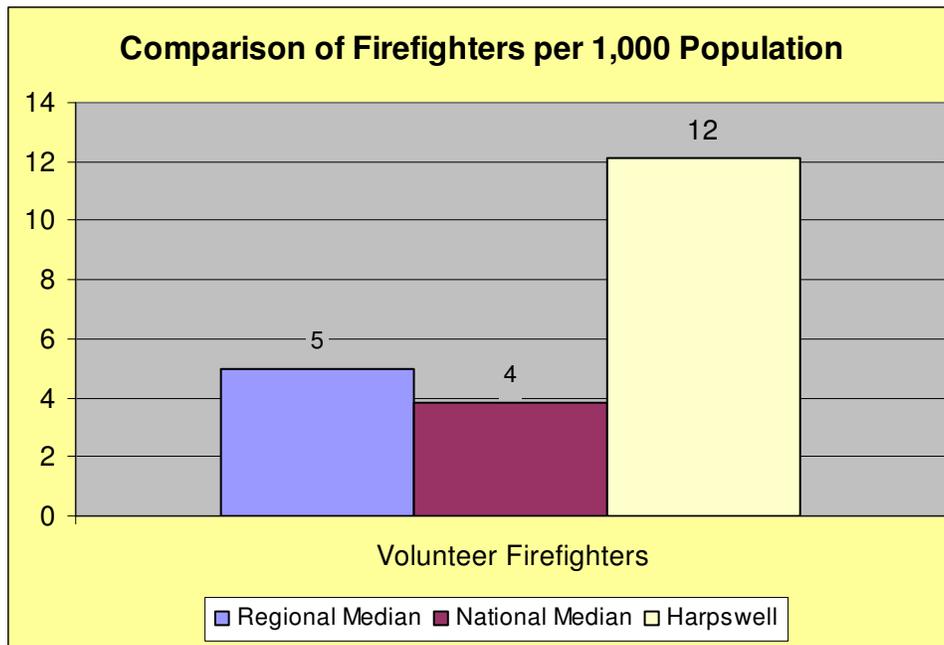
Rank	CHVFD	HNFD	OBIFD
Chief/Asst. Chief	4	3	2
Captain	3	3	3
Lieutenant	0	3	0
Firefighter/EMT	19	16	25
Driver	0	8	1
<b>Total</b>	<b>26</b>	<b>33</b>	<b>31</b>

**Figure 65: Staffing Summary by Role**

Role	CHVFD	HNFD	OBIFD
Fire Only	15	8	22
Fire/EMT	4	8	6
EMT Only	7	9	2
Driver Only	0	8	1
<b>Total</b>	<b>26</b>	<b>33</b>	<b>31</b>

ESCI's analysis of emergency service staffing typically includes a comparison of the community's available firefighting personnel with those of other regional communities serving a similar population. The following section will summarize the personnel assigned to street-level fire suppression service delivery. The chart contrasts the ratio of firefighters to 1,000 population that is available to Harpswell fire departments with the ratio of firefighters available in other similar communities.<sup>30</sup>

Figure 66: Comparison of Firefighters per 1,000 Population



### **Staff Allocation – Use of Volunteer Personnel**

In communities around the country, the number of fire calls has declined over the past decade. Yet as the frequency of fires diminishes, in part due to stricter fire codes and safety education, the workload of fire departments has risen sharply due to medical calls, hazardous materials calls, and every sort of household emergency now addressed by fire departments. Therefore, as the frequency of fires diminishes, the need for a ready group of firefighters has increased.

<sup>30</sup> NFPA, Michael J. Karter Jr., *U.S. Fire Department Profile Through 2004*, September 2005.

Although modern codes tend to make fires in newer structures more infrequent, today's energy-efficient construction (designed to hold heat during the winter) also tends to confine the heat of a hostile fire. In addition, research has shown that modern furnishings generally burn hotter (due to synthetics), and roofs collapse sooner because prefabricated roof trusses separate easily after a very short exposure to flame. In the 1970s, scientists at the National Institute of Standards and Technology found that after a fire breaks out, building occupants had about 17 minutes to escape before being overcome by heat and smoke. Today, that estimate is three minutes.<sup>31</sup> The necessity of firefighters arriving on the scene of a fire in the shortest span of time is more critical now than ever.

Along with a quick response, a robust, well-trained, and appropriately equipped compliment of emergency workers is needed to successfully mitigate structural fires. Too few firefighters at an emergency scene decrease effectiveness and increase the risk of injury to all.

While many requests for emergency assistance are comparatively low risk requiring few personnel, the emergency workers needed to mitigate a structure fire are greater. A house fire involving just one room and its contents is considered as a moderate risk incident in the industry. The Commission for Public Safety Excellence provides a sample that suggests that 15 firefighters be assembled to combat just a moderate risk emergency.

Nationally, the number of volunteer firefighters available during daytime hours is declining. While it was once common for departments to rely on employees from local businesses to respond during emergencies, the practice is much less prevalent now. Today, people frequently work more than one job. Family responsibilities and long commutes only compound the difficulties for volunteers; lessening the time available for training and emergency duty.

To reduce this concern in Harpswell, some volunteer personnel are both fire and EMS trained, while others are single discipline oriented.

### **Incident Staffing**

Work at fire emergencies can be categorized into two key components — life safety and fire flow. Life safety relates to the number of building occupants, their location within the structure,

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<sup>31</sup> National Institute of Standards and Technology, *Performance of Home Smoke Alarms, Analysis of the Response of Several Available Technologies in Residential Fire Settings*, Bukowski, Richard, et al.

their status, and their ability to take self-preservation action. Life safety tasks involve the search, rescue, and evacuation of victims. The fire flow component is the delivery of enough water to extinguish the fire and create an environment within the building that allows entry by firefighters, or the escape of occupants.

The number and types of tasks needing simultaneous action will dictate the minimum number of firefighters required to combat different types of fires. In the absence of adequate personnel to perform concurrent action, the command officer must prioritize the tasks and complete some in chronological order, rather than concurrently. These tasks include: command, scene safety, search and rescue, fire attack, water supply, pump operation, ventilation, and back-up/rapid intervention.

The Center for Public Safety Excellence has developed a sample critical tasking analysis for the number of emergency workers required for various levels of risk. That analysis is summarized in the figure below.

Figure 67: Sample Critical Task Staffing Need Based on Level of Risk

Critical Task <sup>32</sup>	Maximum Risk	High Risk	Moderate Risk	Low Risk
Attack line	4	4	2	2
Search and rescue	4	2	2	
Ventilation	4	2	2	
Backup line/rapid intervention	4	3	2	2**
Pump operator	1	1	1	1
Water supply	1	1	1	
Utilities support	1	1	1	
Command/safety	2	2	2	1***
Forcible entry	*			
Salvage	*			
Overhaul	1*			
Communication	1			
Chief's aide	1	1		
Operations section chief	1			
Logistics	1			
Planning	1*			
Staging	1*			
Rehabilitation	1			
Division/group supervisors	2*			
High-rise evacuation	10*			
Stairwell support	10*			
<b>Total Required</b>	<b>51</b>	<b>17</b>	<b>13</b>	<b>4 to 6</b>

\* At maximum and high-risk fires, additional personnel may be needed for these tasks.

\*\* Backup line may not be required for certain incidents.

\*\*\*Can often be handled by the first due officer.

Delivering sufficient numbers of personnel to the scene to accomplish all the various tasks that are required to effectively control an emergency is essential. The most labor-intensive incidents are structure fires. As is shown by the preceding figure, national criteria suggests at least 13 personnel be on scene of a fire in a single family home for safe and effective operations. More personnel are needed as the size of the structure increases, the life risk increases, or when special hazards exist.

At minimum staffing, the three departments serving the Town have approximately two to eight personnel each available to respond to structure fires during the day. This number does not

<sup>32</sup> All tasks may be functional during the early moments of firefighting, but sometimes certain duties take place in sequence depending on the situation, thus reducing the total number of people needed.

significantly change on nights and weekends, as it does in many other communities. It should be noted here that this information was obtained through oral interviews with departmental staff. Under normal circumstances, NFIRS<sup>33</sup> data would have been analyzed to determine actual response numbers but that information was not available in this case. Each department realizes that use of mutual and auto-aid is imperative to augment this force. For this reason, the departments actively participate in automatic response on structure fires, regardless of location in the Town. This methodology is commendable and should continue.

### **Assignment of Responsibilities**

Normal job functions within the three departments are determined by assignment through the fire chief and, typically, are delegated based on personal interest and/or area of expertise. Other duties may be assigned to individuals or to groups of individuals (for example: fire station or apparatus) depending on the situation and circumstance.

The fire departments do not maintain any standing committees on which volunteer administrative, support, and/or operations personnel may serve. The departments may wish to consider standing committees for such areas as training, finance, or other support functions to provide opportunities for member involvement and to ensure that rank and file input is considered in planning processes. An apparatus, facilities, and equipment committee becomes active only when projects of that nature are pending, thereby avoiding squandered time and effort on the part of the volunteers.

### **Recommendation:**

- Ensure that all response personnel are trained to Hazardous Materials Operations level as required by OSHA 1910.120.

As will be illustrated later in the service delivery section of this report, events such as the Patriot Day storm of 2006, create circumstances that strain the personnel of all three departments by forcing them to perform in roles other than those considered to be *mission critical*. On site interviews with departmental staff indicated that fire department personnel are routinely called on to clear trees from roadways, pump water from basements, and perform other duties that detract from the department's ability to focus on emergency response.

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<sup>33</sup> NFIRS: National Fire Incident Reporting System.

It is understandable that the fire departments are called on for these types of events since citizens have always viewed them as a service to the community. Although admirable, an over use of firefighters to fulfill duties other than those pertaining to the primary mission, may tend to detract from the attractiveness of volunteerism. Additionally, during disaster events, emergency services personnel and equipment have a much greater likelihood of being utilized for emergencies, and using them for other duties may render them unavailable or reduce manpower to levels below what is necessary to mitigate some incidents.

In lieu of using dedicated emergency personnel for non-emergency purposes, some communities have developed Community Emergency Response Teams (CERTs) in cooperation with local, state, and federal emergency management agencies. These teams serve as a supplement to local emergency systems and receive formal training through the Federal Emergency Management Agency (FEMA). These teams are comprised of citizens willing to serve under disaster situation, but not always available to volunteer on a regular basis. They can assist emergency management and other emergency services personnel, as well as supplement public works and forestry personnel, so that emergency resources remain available for emergency response.

CERT training for community groups is usually delivered in 2.5-hour sessions, one evening a week over a seven-week period. The training consists of the following:

- Session I, DISASTER PREPAREDNESS: Addresses hazards to which people are vulnerable in their community. Materials cover actions that participants and their families take before, during, and after a disaster. As the session progresses, the instructor begins to explore an expanded response role for civilians in that they should begin to consider themselves disaster workers. Since they will want to help their family members and neighbors, this training can help them operate in a safe and appropriate manner. The CERT concept and organization are discussed as well as applicable laws governing volunteers in that jurisdiction.
- Session II, DISASTER FIRE SUPPRESSION: Briefly covers fire chemistry, hazardous materials, fire hazards, and fire suppression strategies. However, the thrust of this session is the safe use of fire extinguishers, sizing up the situation, controlling utilities, and extinguishing a small fire.

- Session III, DISASTER MEDICAL OPERATIONS PART I: Participants practice diagnosing and treating airway obstruction, bleeding, and shock by using simple triage and rapid treatment techniques.
- Session IV, DISASTER MEDICAL OPERATIONS, PART II: Covers evaluating patients by doing a head to toe assessment, establishing a medical treatment area, performing basic first aid, and practicing in a safe and sanitary manner.
- Session V, LIGHT SEARCH AND RESCUE OPERATIONS: Participants learn about search and rescue planning, size-up, search techniques, rescue techniques, and most important, rescuer safety.
- Session VI, DISASTER PSYCHOLOGY AND TEAM ORGANIZATION: Covers signs and symptoms that might be experienced by the disaster victim and worker. It addresses CERT organization and management principles and the need for documentation.
- Session VII, COURSE REVIEW AND DISASTER SIMULATION: Participants review their answers from a take home examination. Finally, they practice the skills that they have learned during the previous six sessions in disaster activity.<sup>34</sup>

CERT is about readiness, people helping people, rescuer safety, and doing the greatest good for the greatest number. CERT is a positive and realistic approach to emergency and disaster situations where citizens will be initially on their own and their actions can make a difference. Through training, citizens can manage utilities and put out small fires; treat the three killers by opening airways, controlling bleeding, and treating for shock; provide basic medical aid; search for and rescue victims safely; and organize themselves and spontaneous volunteers to be effective.

**Recommendation:**

- Form a Community Emergency Response Team to supplement the local fire departments during times of disaster.

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<sup>34</sup> Department of Homeland Security, Federal Emergency Management Agency, Citizen Corps. [www.citizencorp.gov/cert](http://www.citizencorp.gov/cert).

## Personnel Management

An organization's people are its most valuable resource. Careful attention must be paid to managing that resource to achieve maximum productivity for the organization and maximum satisfaction for the individual. A safe working environment, fair treatment, and recognition for a job well done are key components to job satisfaction and retention of members.

It is important that members of an organization know to whom they should go when they have a problem, question, or issue related to their relationship with the department. In large companies, this function is typically handled by a human resource (HR) department. Staff within such a department handles questions, issues, and tasks related to appointment, benefits, performance, disciplines, promotion, or termination of employees.

In the not so distant past, by tradition, the fire chief was the final authority for all inquiries associated within the fire department. Even for a paramilitary organization like the fire service, the time of complete reliance on one individual to be the expert on everything is, thankfully, an idea of the past. Fire service administrators now, and rightfully so, should rely on professionals dedicated to a specific discipline. This includes finance and accounting, plans examination, public educators, and human resources.

### **Organizational Structure**

A well-designed organizational structure should reflect the efficient assignment of responsibility and authority, allowing the organization to accomplish effectiveness by maximizing distribution of workload. The lines on an organizational chart simply clarify accountability, coordination, and supervision. Many examples of fire department organizational structures for various sizes of departments can be found in texts such as the National Fire Protection Association *Fire Protection Handbook*.

Span of control, also known as span of management, is a human resources management term that refers to the number of subordinates a supervisor can effectively manage. Developed in the United Kingdom in 1922 by Sir Ian Hamilton, the concept of span of control evolved from the assumption that managers have finite amounts of time, energy, and attention to devote to their jobs. In his research of British military leaders, Hamilton found that leaders could not effectively control more than three to six people directly.

This generally accepted *rule of thumb* for span of control is still considered relevant today and applies not only to the military, but correspondingly to the fire service. It is important to note that all managers experience a decrease in effectiveness as their span of control exceeds the optimal level. In other words, the limitations implied by span of control are not short-comings of certain individual managers, but rather of managers in general. In addition, it is important to understand that span of control refers only to direct reports, rather than to an entire corporate hierarchy (all personnel in the fire department).

"Extending span of control beyond the recommended limits engenders poor morale, hinders effective decision making, and may cause loss of the agility and flexibility that give many entrepreneurial firms their edge."<sup>35</sup>

Reasonable disciplinary authority should reside with supervisors who should be thoroughly trained in such procedures. While more focus on disciplinary process can be found elsewhere in this report, the relationship of appropriate authority to the organizational structure is reviewed here.

Thorough job descriptions should provide the details of each position and ensure that each individual's specific role is clear and centered on the overall mission of the organization.

### ***Town of Harpswell***

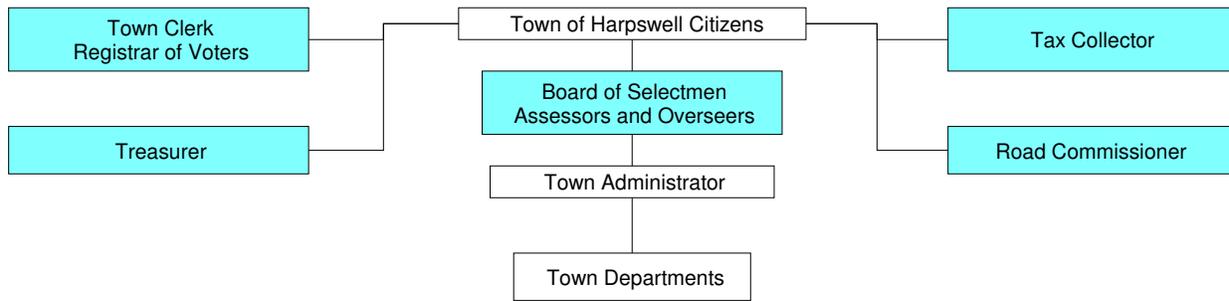
Although the Town of Harpswell does not currently manage or operate fire service activities, one focus of this study is to determine if there should be a change in the manner of organization oversight of fire service throughout the Town. With this in mind, ESCi evaluated the Town's organizational structure as a separate entity from the three volunteer departments servicing the municipality.

The chain of command is clearly defined for the Town, and the chart below illustrates those lines of supervision.

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<sup>35</sup> Hendricks, Mark. *Span Control* Entrepreneur, January 2001.

Figure 68: Town of Harpswell Organizational Chart<sup>36</sup>



Should the Town choose to pursue more organizational oversight to the fire departments, those positions would report to the Town administrator as do all other department heads.

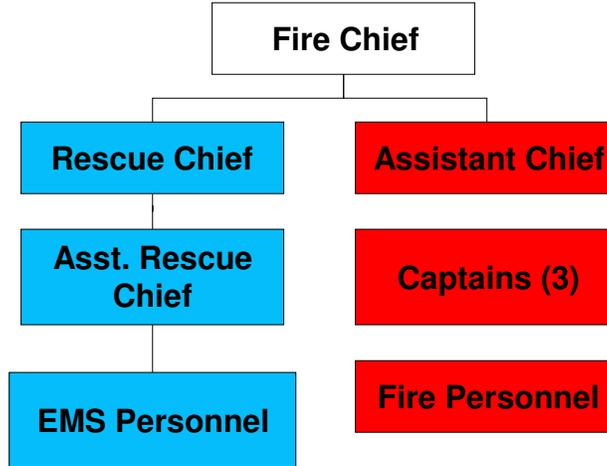
### ***Cundy’s Harbor Volunteer Fire Department***

A review of this department’s organizational chart reveals that they are organized in a typical top-down hierarchy. The organizational structure of the department demonstrates a clear unity of command, in which each individual member reports to only one supervisor (within the context of any given position) and is aware to whom he or she is responsible for supervision and accountability. The organizational structure is charted with clear, designated operating divisions, where applicable. Those individuals supervising or operating within a specific division are positively clear as to the role of the division and its goals and objectives.

The following figure indicates a chain of command for CHVFD that is relatively consistent with the distribution of responsibilities and authority beginning with the fire chief.

<sup>36</sup> Those positions highlighted in blue are elected officials. All others are appointed.

Figure 69: CHVFD Organizational Chart



The fire chief appears to directly supervise four other individuals, including the assistant chief and three captains. The rescue chief supervises an assistant chief. Their span of control falls within the range typically considered normal and acceptable. The fire chief has been provided with the authority to suspend a member from active duty.

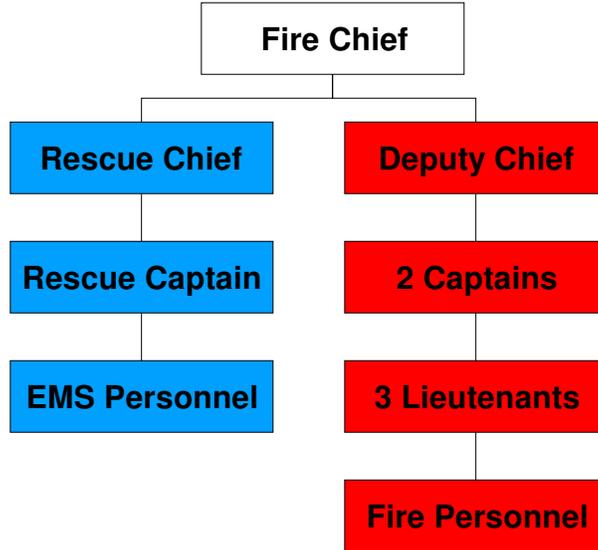
The department reports that current position classifications or descriptions may need to be updated to ensure that they are an accurate reflection of the typical responsibilities and activities of all department positions. These documents should be revised to adequately describe the primary functions and activities, critical tasks, and levels of supervision and accountability, as well as reasonable qualifications of each class or position within the organization.

### ***Harpswell Neck Fire and Rescue***

A review of this department’s organizational chart reveals that they are organized in a typical top-down hierarchy. The department’s organizational structure demonstrates a clear unity of command. The organizational structure is charted with clear, designated operating divisions where appropriate. Those individuals supervising or operating within a specific division are positively clear as to the role of the division and its goals and objectives.

The following figure indicates a chain of command for HNFR that is relatively vertical, with distribution of responsibilities and authority beginning with the fire chief.

Figure 70: HNFR Organizational Chart



The alignment is that of what one would expect within a single station organization with supervisory positions having one, or two, and a maximum of three direct reports. ESCi would consider this to be on the lighter side of span-of-control. This is reflective of the smaller size of the organization and that personnel have more than one area of responsibility.

The fire chief appears to directly supervise two other individuals, including the rescue chief and the deputy fire chief. The chief's span of control falls within the range typically considered normal and acceptable. The fire chief has been provided with the authority for discipline up to suspension from duty pending a hearing.

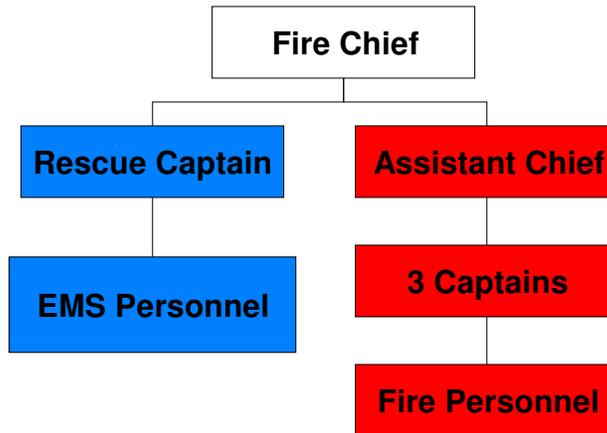
The department policies contain inadequate position classifications or descriptions. In fact, little information is provided on the process of obtaining or maintaining membership in the organization. These documents should be revised to adequately describe the primary functions and activities, critical tasks, and levels of supervision and accountability, as well as reasonable qualifications of each class or position within the organization.

***Orr's and Bailey Island Fire and Rescue***

A review of this department's organizational chart reveals that they are organized in a typical top-down hierarchy. The department's organizational structure demonstrates a clear unity of command. The organizational structure is charted with divisions where appropriate. Those

individuals supervising or operating within a specific division are positively clear as to the role of the division and its goals and objectives.

Figure 71: OBIFD Organizational Chart



The fire chief appears to directly supervise five other individuals, including the assistant chief, rescue captain, and three fire captains. The chief's span of control falls within the range typically considered normal and acceptable. The fire chief has been provided with the disciplinary authority for suspension from active duty pending a hearing.

The department maintains a basic set of job classifications that reflect the typical responsibilities and activities of the positions. The documents adequately describe the primary functions and activities, but do not thoroughly describe critical tasks, supervision, and accountability levels, as well as reasonable qualifications.

### **Foundational Policy**

Organizations that operate efficiently are typically governed by clear policies that lay the foundation for effective organizational culture. These policies set the boundaries for both expected and acceptable behavior, while not discouraging creativity and self-motivation.

A comprehensive set of departmental operating rules and guidelines should contain at least two primary sections. The following format is suggested.

1. Administrative Rules – This section would contain all of the rules that personnel in the organization are required to comply with at all times. Administrative rules, by definition, require certain actions or behaviors in all situations. The department board should adopt or approve the administrative rules since the fire chief is also subject to them. However, the board should delegate authority to the chief for their enforcement on department personnel. The administrative rules should govern all members of the department - paid, volunteer, and civilian. Where rules and policies, by their nature, require different application or provisions for different classifications of members, these differences should be clearly indicated and explained in writing. Specifically, administrative rules should contain sections which address:

- Public records access and retention
- Contracting and purchasing authority
- Safety and loss prevention
- Respiratory protection program
- Hazard communication program
- Harassment and discrimination
- Personnel appointment and promotion
- Disciplinary and grievance procedures
- Uniforms and personal appearance
- Other personnel management issues

2. Standard Operating Guidelines (SOGs) – This section should contain *street-level* operational standards of practice for department personnel. SOGs are different from administrative rules in that variances are allowed in unique or unusual circumstances where strict application of the SOG would be less effective. The document should provide for a program of regular, systematic updating to assure it remains current, practical, and relevant. SOGs should be developed, approved, and enforced under the fire chief’s direction.

### ***Cundy’s Harbor Volunteer Fire Department***

CHVFD maintains two primary policy manuals: By-Laws and Standard Operating Guidelines. The By-Laws were available for review. While this document lays out the corporation’s basic organization, it provides remarkably little additional guidance on administrative matters and, generally, no personnel policies of any kind.

There is no indication of any formal process for membership provided in the By-Laws, though the document does indicate that any resident or property owner who “ makes a financial

contribution to the corporation shall be deemed members of the corporation for the fiscal year in which such contribution is made and shall have the right to vote at any corporation meeting in such fiscal year, annual or otherwise.”<sup>37</sup> A subsequent article of the By-Laws titled *Firefighting Personnel* has been deleted.

Presumably, there is a different process for membership in the corporation and membership as a full-fledged firefighter or ambulance responder. ESCi did find one paragraph in the SOG indicating that “ to be a member, you must attend the monthly training meeting, turn out for calls, and show general interest and support of the fire department.”<sup>38</sup> No additional information regarding membership application, screening, or appointment was found in either document.

Given the extremely basic nature of the By-Laws, the department needs to develop a much more comprehensive set of administrative policies governing personnel issues, membership requirements, discipline, and liability risk. The document should also contain thorough position descriptions. During the review of the draft of this report, Cundy’s Harbor did indicate that they had a process in place for qualifying responding members. However, any such process should be fully documented and formally adopted in the By-Laws or other department policy documents.

The SOGs were given a basic review for quality and content. The fire and rescue SOG manuals were not particularly well organized, and consisted of a collection of several documents that were authored at different times and in different styles. There was a lack of consistency between fire and rescue procedures in style and appearance.

The policy documentation includes a sexual harassment policy, infection control policy, basic response procedures, quality assurance, hazard communication, and a hazardous materials response policy. It would be beneficial for the procedures to be expanded to provide members with a greater range of guidance on fireground operations such as fire streams, pump operations, ladder placement, ventilation, search procedures, and evacuations.

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<sup>37</sup> Cundy’s Harbor VFD, Inc., By-Laws, dated 1-17-07.

<sup>38</sup> Cundy’s Harbor Fire Department Standard Operating Guidelines dated 2002.

***Harpswell Neck Fire and Rescue***

HNFR maintains two primary policy manuals: By-Laws and the Standard Operating Guidelines. The manuals were given a basic review for quality and content. The manuals were fairly well organized, and it appears that a great deal of time went into writing the various policies and procedures in a professional and clear manner. The documentation has some limited entries regarding personnel behavior and department discipline. However, specific policies regarding such issues as sexual harassment, non-discrimination and disciplinary processes should be expanded to provide better protection for the department against the possibility of civil action by a disgruntled member.

The SOGs are well organized, easy to understand and apply, and reflect the current industry standards and best practices. The procedures are reported to be reasonably up-to-date, but with no prescribed system in place to review and update the procedures on a periodic basis. It would be beneficial for the procedures to be expanded to provide members with a greater range of guidance on fireground operations such as fire streams, pump operations, ladder placement, ventilation, search procedures, and evacuations.

***Orr's and Bailey Islands Volunteer Fire Department***

OBIFD maintains four primary policy manuals: By-Laws, Fire Standard Operating Guidelines, Rescue Standard Operating Guidelines, and Respiratory Protection Manual. The manuals were given a basic review for quality and content. The manuals were fairly well organized. The documentation includes some of the appropriate policies focused on reducing the risk of civil liability.

The SOGs are well organized, easy to understand and apply, and reflect the current industry standards and best practices. The procedures are reported to be reasonably up-to-date, but with no prescribed system in place to review and update the procedures on a periodic basis. The procedures contain some sections on emergency scene operations and can provide field personnel with guidance on many fireground operations.

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Following the recommended format discussed earlier, the SOG manuals of the three departments should be expanded to include a greater collection of guidelines for actual incident actions including special hazard incidents such as technical rescue, hazardous materials

releases, etc. Several model documents are available through industry trade organizations. The most advantageous approach would be the development of joint SOGs for all three departments, with only minor local modification necessary to address individual department needs. Various sample topics are provided in the following tables. Many of these may have limited application to the Harpswell departments, but the list is offered as a means of initial guidance in the SOG development process.

Figure 72: Examples of SOG Topics for Field Operations

<b>Alarms and Response Procedures</b>	<b>Medical Emergencies</b>
Alarm Response Procedures	Responses
Alarm Response Areas	Operations with Ambulance Personnel
Automatic Aid	Emergency Medical Technician - Protocols
Mutual Aid	Major Medical Incidents
<b>Fire Company Operations</b>	Triage
First to Arrive Duties	Hazardous Materials
Returning Companies to Service	Suspected Drug Overdose
Use of Civilians	Animal Bites
Fire Scene Investigations	Vial of Life and Medic Alert Tags
Personal Alert Safety Devices	Attempted Suicide
On-Scene Equipment Inventory	Suspected Homicide
Personnel Accountability System	DOA (Dead on Arrival)
2 IN 2OUT	Suspected Child Abuse
Initial Fireground Operations	Suspected Sexual Assault
Highway Incident Safety	Hospital Disaster Notification
<b>Command Operations</b>	EMS Reports
General Strategic Guidelines	EMS Radio Procedures
Incident Management System	BLS Rules and Regulations
Command Post Procedures	<b>Electrical Emergencies</b>
Welfare Checks	Electrical Emergency Operations
Helicopter Operations	<b>Rescue Operations</b>
Area Evacuation	Vehicle Rescue and Extrication
Building Evacuation	Vertical Line (Rope) Operations
<b>Firefighting</b>	Rescue from Machinery
Structure Fires (General)	Cave-in and Manhole Rescues
Operations in Sprinklered Buildings	Building Collapse
On-Site Auxiliary Fire Equipment	Rescue at Structure Fires
Wildland Fires	<b>Transportation Emergencies</b>
Vehicle Fires	Aircraft Emergencies
Metal Fires	<b>Hazardous Materials Incidents</b>
Fire Stream Management	Hazardous Materials (General)
Fire Watch Detail	Flammable Fuel Spill (Liquid or Gas)
Fires in US Mailboxes	LPG Emergencies
Procedures	Explosives and Bombs
Carbon Monoxide Hazards	Pesticide Procedures
Thermal Image Camera	Radioactive Materials
<b>Major Emergency Operations</b>	Natural Gas Filled Structures - No Fire
Town Emergency Operations Plan	Natural Gas Fed Fire - Inside Structure
<b>Public Assistance Operations</b>	Broken Natural Gas Main - Fire
Public Assistance Alarms	Broken Natural Gas Main - No Fire

**Figure 73: Examples of SOG Topics for Non-Emergency Operations**

<b>Station Operations</b>	<b>Equipment Operations</b>
Station Operations - General	Equipment Repairs
Station Maintenance	Equipment Out of Service
Purchasing Procedures	Color Coding Equipment
Equipment Loan Out	Hose Maintenance
Emergency Power Systems	Preventive Maintenance - SCBA's
Miscellaneous Station Duties	Respiratory Breathing Air Systems
Telephone Use	Ladder Maintenance
<b>Apparatus Operations</b>	Nozzle Maintenance
Apparatus Maintenance	Fire Extinguishers
Vehicle Out of Service Procedure	Hand Tool Maintenance
Testing Apparatus Pumps	Power Tool Maintenance
Driving Emergency Vehicles	<b>Public Education</b>
Warning Devices	Public Education Scheduling Policy
Apparatus Operational Limits	Public Relations
Fueling Procedure	Station Tours
Apparatus Snow Chains	Fire Extinguisher Demonstrations
Driver Operator - Pump Certification	Engine Demonstrations

**Compensation and Benefits**

There are neither full-time paid personnel staffed by any of the three fire departments nor any full-time paid fire personnel for the Town. Therefore, compensation and benefits are limited to stipends or response pay to individuals based on a point system devised by the individual departments.

***Cundy’s Harbor Volunteer Fire Department***

CNVFD uses volunteers exclusively to carry out its functions. All administration, support, and response positions are filled by volunteers. CHVFD has a depth of volunteer personnel from divergent backgrounds, employed in a variety of professional and blue collar occupations. This blending of citizens appears to add strength to the organization.

CHVFD provides no means of compensation to its members. Unlike HNFR and OBIFD, CHVFD does not utilize a point system, nor do they compensate their officers.

***Harpswell Neck Fire and Rescue***

HNFR utilizes a stipend program that assigns point values to responses and training sessions for each individual member. A day-time response (6:00 a.m. to 6:00 p.m.) is awarded two

points. A night-time response (6:00 p.m. to 6:00 a.m.) is awarded one point. Attendance at training and meetings sessions is awarded one point. At the end of the fiscal year, the total number of points accumulated throughout the department, with the exception of the fire chief, the rescue chief, asst. fire chief, and asst. rescue chief are added together. This total is used as a divisor of the budgeted \$6,500.00 for stipends to determine a per point dollar amount. That dollar amount is multiplied by each member's point total.

The fire chief, asst. fire chief, rescue chief, and asst. rescue chief each receive an annual \$500.00 stipend in lieu of point total awards. The total amount budgeted for stipends is \$8,500.00 annually.

***Orr's and Bailey Island Fire Department***

OBIFD uses volunteers exclusively to carry out its functions. All administration, support, and response positions are filled by volunteers. OBIFD has a depth of volunteer personnel from divergent backgrounds, employed in a variety of professional and blue collar occupations. This blending of citizens appears to add strength to the organization.

OBIFD utilizes a point stipend system similar to that of HNFR, and the total dollar amount for stipends is currently \$13,000.00. Additionally, points are calculated differently as indicated in the figure below.

**Figure 74: OBIFD Point Stipend Schedule**

Description	Point Value
Fire Call over one hour	5
Fire Call under one hour	3
EMS Call on scene	3
EMS Call with transport	5
Fire Standby at Station	1
Rescue Standby at Station	1
Inventory Checks Rescue	3
Maintenance Checks, Truck and Airpacks	3
Training (In house)	4
Training (Outside up to four days)	2/day
Training (Outside Long-term)	1/day
Work Detail	2
Officers Meeting	3

In addition to the above indicated point schedule, chief officers receive an annual stipend in the amount of \$1,000.00 for fire chief and rescue captain, and \$300.00 for asst. fire chief and line captains.

**Recommendation:**

- Although each department has proud traditions related to their various benefit and compensation programs, some standardization between the three departments may be advisable so that each geographical area offers similar opportunities for volunteer recruitment and retention incentives. The desired outcome is to ensure that any lack of compensation or benefits in one department, when compared to another, does not become a disincentive for members or potential members.

**Disciplinary Process**

***Cundy's Harbor Volunteer Fire Department***

CHVFD does not have an established disciplinary policy.

***Harpswell Neck Fire and Rescue***

HNFR has an established disciplinary policy. The disciplinary process for personnel is progressive and an appeal process is provided. Personnel receive education on the disciplinary process during initial orientation to the department. Corrective action practices are very straight forward and conform to accepted practices and the laws of the State of Maine.

***Orr's and Bailey Islands Fire Department***

OBIFD has an established disciplinary policy. Discipline is progressive in nature and an appeal process is provided. Personnel receive education on the disciplinary process during initial orientation to the department.

**Recommendations:**

- Cundy's Harbor Volunteer Fire Department should establish a written disciplinary policy.
- Develop a standard disciplinary process utilized and followed by all three departments serving the Town.

### **Counseling Services**

Emergency services bring otherwise ordinary people into life and death situations that sometimes end very tragically. Even though fire department personnel are trained responders, they do not have an impregnable shield that prevents them from being affected by traumatic events. Critical incident stress is a very real condition that affects all emergency service workers to some degree or another. It is how emergency workers deal with that stress that makes the difference. The trigger for significant psychological trauma may be a single event or a series of events compounding on each other.

Fire and EMS departments have recognized the need to provide a support system for their personnel who are exposed to traumatic incidents. Critical incident stress interventions are a short-term process only. Though normally sufficient to help emergency personnel cope with the event, on occasion longer term support is needed. Failure to provide that support can ultimately lead to the loss of a valued department member.

Although no one department is capable of delivering the necessary counseling services on its own, CISD services are provided to these departments through Southern Maine EMS upon request.

An Employee Assistance Program (EAP) is sometimes also made available to emergency personnel as a long-term stress intervention tool. EAPs operate separate from sponsored medical plans and provide additional support for other life problems that may affect a member's motivation and work quality such as substance abuse, marital difficulties, financial complications, and the like. The Town does not currently offer EAP services to its internal staff. If, at some point, this service is added to the benefits provided to its employees, the Town may wish to consider also providing EAP services to personnel within the volunteer fire departments.

#### **Recommendation:**

- If the Town, at some point, determines the need to implement an EAP, such services should be offered to the volunteer fire departments as well.

### **Application and Recruitment**

Recruitment of personnel is a critically important function for emergency service agencies. The community places a tremendous amount of trust in fire department personnel. The process used to select personnel should be quite comprehensive.

The American's with Disabilities Act (ADA) prohibits discrimination against individuals with physical disabilities, but permits employers to establish the physical standards that are required to perform the primary functions of any job safely and effectively. History has shown that the most effective method of avoiding a litigation suit involving ADA is through reasonable and consistent application of job-relevant pre-employment physical ability testing.

#### ***Cundy's Harbor Volunteer Fire Department***

The recruitment of new fire department volunteers is conducted through an informal process of referral and passive advertising through community activities. No outside agencies are involved in the process. Applicants are subject to reference and background checks, but not qualification or aptitude testing. Oral interviews are included as a component of the process.

No baseline physical examination is conducted on personnel either initially or periodically as recommended by *NFPA 1582*.<sup>39</sup>

#### ***Harpswell Neck Fire and Rescue***

New volunteer recruitment for the fire department is conducted through an informal process of referral and passive advertising during community activities. No outside agencies are involved in the recruitment process. Applicants are subject to qualification, reference, and background checks and oral interviews are included as a component of the process.

HNFR reportedly requires both baseline and annual physicals through Occupational Testing in West Bath, including respiratory evaluation as recommended by *NFPA 1582*.

#### ***Orr's and Bailey Islands Fire Department***

The recruitment of new fire department volunteers is conducted through an informal process of referral and passive advertising through community activities. No outside agencies are involved in the process. Applicants are subject to reference and background checks, but not qualification or aptitude testing. Oral interviews are included as part of the process.

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<sup>39</sup> *NFPA 1582: Comprehensive Occupational Medical Program for Fire Departments*, 2007.

A baseline physical examination is conducted on all personnel, and personnel with suppression responsibilities receive annual physicals including respiratory evaluation.

**Recommendations:**

- All departments should adopt *NFPA 1582* and implement a system of initial physical testing prior to active suppression activities, as well as periodic physical and respiratory evaluations.
- Establish a volunteer retention, recruitment program region-wide using, for example, concepts found in the appendix on *Staffing Needs and Volunteer Sustainability*.
- Standardize volunteer qualifications, requirements, and application process for participation in service delivery for all Harpswell fire departments.

**Competency Testing**

Once on staff, personnel should be evaluated periodically to ensure their continued ability to perform job duties safely and efficiently. Technical and manipulative skills should be evaluated on a regular basis. This provides documentation about a person’s ability to perform their responsibilities and provides valuable input into the training and education development process. The lack of such a program may lead to decreased emergency scene performance as member’s age and/or become less active.

All three departments currently rely on observation of member performance during training exercises to evaluate the physical ability and competency of members. While this is a traditional method for evaluating performance in volunteer departments, and certainly serves to provide at least some level of evaluation, consideration should be given to establishing a more comprehensive evaluation program. This could consist of an annual physical abilities evaluation and basic skill competence demonstrations. Regular evaluation and feedback for personnel is critical to behavior modification and improvement.

None of the departments have a formal performance evaluation system currently in place for their staff.

Despite the challenge of implementing such a program in a volunteer department, it is important to maintain such programs whenever possible. It has long been proven that employees and members sincerely wish to perform well and to be a contributing part of any organization. This

desire to succeed is best cultivated through effective feedback that allows a member to know what he/she is doing well or what needs improvement. The honest and effective presentation of this feedback encourages the member to reinforce those talents and abilities they already excel in and to work harder to improve the areas where they fail to perform as desired.

**Recommendations:**

- All Harpswell fire departments should consider establishing a formal annual physical abilities evaluation and skill competency demonstration for emergency response personnel.
- The fire departments should provide all personnel with some form of simple, basic performance evaluations at least annually.

**Health and Safety**

Firefighting is a very stressful job that requires physically and mentally fit personnel to perform it safely, effectively, and efficiently. Approximately 50 percent of firefighter fatalities come from heart attacks. Of those fatalities, 50 percent had existing heart problems. It is clearly in the interest of all fire departments and individual firefighters to ensure programs are in place to periodically review and support high levels of medical and physical fitness.

Comprehensive physical capacity testing should be conducted at least annually. The evaluation can mirror an entry-level physical capacity test but should, within limits, give some consideration of an individual's age.

Physical capacity testing cannot detect all potential limiting conditions of an individual's health and fitness level. Periodic medical examinations are also necessary. National standards for firefighters recommend a regular medical examination. The evaluation should include all the criteria included in the entry-level examination as well as periodic stress EKGs and blood toxicology screening. Communicable disease vaccinations can also be updated as needed during this process.

*NFPA 1500* recommends a fire department have an active safety committee that meets on a regular basis.<sup>40</sup> Unfortunately, none of the fire departments servicing the Town have a formal safety committee and no joint committee was indicated to be in operation.

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<sup>40</sup> *NFPA 1500: Standard on Fire Department Safety and Health Program, 2007.*

**Recommendation:**

- A joint safety committee should be implemented with representation from each of the three departments.

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## Training Programs

One of the most important keys to a successful fire service is the level and type of training. Anthony Granito, author of *Fire Service Instructor's Guide*, makes the following observation:

“A good training program is undoubtedly the single most important factor in producing and maintaining a high level of proficiency in any fire department. It not only produces high efficiency initially, but also affects future efficiency when we consider that the rawest recruit now being trained may be chief of department or at least a senior officer in 20 or 30 years.”

Learning by experience alone is a slow process that can never lead to broad subject knowledge. While individual experiences may give an individual an adequate ability to perform, it certainly can never yield insight into the wide range of possibilities likely to be encountered during an emergency incident. The function of a training program is not merely imparting knowledge and technical skills to an individual. Training must go beyond that.

In order for a training program to be effective, it must develop the self-confidence to perform correctly under stressful and hostile conditions. A training program must be systematic, and must provide feedback to the trainee. The goals of training should always focus on performance, never merely acquiring a certain number of hours.

Key fire department training program elements include:

Training division administration	Training division personnel
Training schedules	Training facilities
Training program goals & objectives	Motivation for training
Methodology utilized for training	Company operations & performance
Types of reinforcement used	Personnel targeted for training
Priority towards training	Peer group commitment to training

In order to ensure quality training is provided, it should be based on established standards of good practice. There are a variety of sources for training standards. Every department should develop or adopt standards and competencies.

Fire training is usually based around the National Fire Protection Association, Delmar Fire Fighter, and IFSTA Firefighter I and II standards and curriculum. Emergency medical service training is based on competencies established by the state of Maine in this case, as well as direction from the federal Department of Transportation, National Highway Traffic Safety Administration EMS Division.

There are legal requirements, benefits, and cautions associated with department training programs. At the federal level, the Superfund Amendment and Reauthorization Act (SARA) required that emergency personnel receive hazardous materials training. OSHA standards oblige employers to protect employees from recognized hazards by, among other things, educating them about bloodborne pathogens, hazardous materials, and may other subjects. Training must be provided on a majority of the mandatory subjects such as:

Emergency Medical Technician	First Aid/CPR
Hazardous Materials	Bloodborne Pathogens
Respiratory Protection	Wildland
Two In - Two Out	Confined Space Awareness
Hazard Communication	Airborne Pathogens

Additionally, federal law requires the following:

- Train all personnel to the minimum level of competency required by applicable regulations.
- Fire departments must deliver and certify adequate and timely training based on applicable standards.
- Departments can be cited for lack of training, documentation, or compliance.
- If your department adopts a standard, it can be enforced.

### ***Cundy's Harbor Volunteer Fire Department***

Training is provided in all of the mandatory subjects as well as a number of additional subjects. CHVFD has developed an in-house training program and company officers provide most in-house training. Based on the documents provided, it appears that CHVFD is meeting the ISO requirement of 20 hours of training per month for firefighters.

Training is provided in incident command system (ICS) and EMS annually, and specialty rescue training is provided to a limited number of personnel. Disaster drills are conducted on a limited

basis and only at an interagency level. Safety officers are established on all hazardous type drills and safety is always maintained. Post incident critiques are conducted on all major incidents. The organization's priority for training is moderate.

Hazardous materials training is delivered at awareness level and all responses above this level are handled by the Brunswick Hazardous Materials Response Team.

***Harpswell Neck Fire and Rescue***

Training is provided in all mandatory subjects as well as a number of additional subjects. HNFR has developed an in-house training program which would be an extension of the formal training program. Company officers provide any in-house (i.e.: company drills) training. Based on records provided, it appears that HNFR is meeting the ISO requirement of 20 hours of training per month for firefighters.

Training is provided in incident command system annually and specialty rescue training is provided on an as needed basis. The organization's training priority is moderate, but adequate based on the amount of training through the fire and EMS divisions.

Hazardous materials training is delivered at awareness level and all responses above this level are handled by the Brunswick Hazardous Materials Response Team.

In order to ensure quality training is provided, it should be based on established standards of good practice. There are a variety of sources for training standards. HNFR has not developed standards and competencies.

***Orr's and Bailey Islands Fire Department***

Training is provided in all of the mandatory subjects as well as a number of additional subjects. OBIFD has developed an in-house training program which has been adopted as the formal training program. Company officers provide any in-house (i.e.: company drills) training. Based on the documents provided, it appears that OBIFD is meeting the ISO requirement of 20 hours of training per month for firefighters.

Training is provided in ICS and EMS annually to keep personnel certified. Specialty rescue training is provided to a moderate number of personnel based on their specific response

assignments. Disaster drills are conducted on a limited basis and only at an interagency level. Safety officers are established on all hazardous type drills and safety is always maintained. Post incident critiques are conducted on all major incidents. The priority for training by the organization is moderate.

Hazardous materials training is delivered at awareness level and all responses above this level are handled by the Brunswick Hazardous Materials Response Team.

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It should be noted that, according to the information that ESCi received and analyzed, all three departments serving Harpswell appear to be meeting state minimum fire training requirements as indicated in the Maine Fire Training and Education Matrix.

In review of the compliance with OSHA CFR Section 1910.120, a significant finding was the lack of personnel trained to the *operations level* specified by the OSHA rules. While all specialists and technicians involved in the special hazardous materials response programs in the Brunswick Hazardous Materials Response Team are properly certified at their respective levels, the volunteer firefighters in the three Harpswell departments receive training only to the *awareness level*.

Of primary concern here is that each department should have firm procedures in place to limit any personnel from performing tasks and functions that would be considered above their level of training and certification at incidents involving hazardous materials release. Personnel not trained beyond the awareness level should not be permitted to respond to hazardous materials incident dispatches, but rather should be directed to remain in an off-site support mode.

The awareness level of training is intended to enable an individual to "...discover a hazardous substance release and... initiate an emergency response sequence by notifying the proper authorities", but nothing else.<sup>41</sup> Obviously, once an incident has been reported, such as a fuel leak from a vehicle called in to 9-1-1, the incident has already been recognized and moved beyond the awareness level. The act of dispatching a fire engine presumes action on the part of the responding crew involving size-up, containment, decontamination, or clean-up. Any of these

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<sup>41</sup> OSHA CFR 1910.120(q)(6)(i).

tasks would exceed the training level certified under awareness and are actions specifically described in the *First Responder Operations Level*.<sup>42</sup> Written procedures should prohibit response by personnel certified by their department at less than the operations level to any incident with a known, suspected, or likely release of a hazardous substance, including fuels and gases at motor vehicle accidents.

**Recommendations:**

- Consider providing various training opportunities beyond the basic skill sets that could include officer development, specialized skill training, fire investigation, public education, etc., based on the current needs of the community. Such opportunities often provide motivation for newer members seeking to expand their skill set.
- Implement the use of proficiencies and competency standards, and test firefighters and EMS personnel annually to that established standard.
- All departments should train firefighters in hazardous materials to the operations level as outlined by OSHA 1910.120.

**Records and Reports**

Every fire organization, no matter how large or small, requires a system for recording information on training. Training records should provide basic information on drills, formal training, education, and special courses completed by all personnel. Good documentation through training records helps in making many management decisions.

The American Insurance Association makes the following recommendations on training records:

“Tests, examinations, and grading contribute very little toward department or personnel evaluations unless the results of such tests are recorded and filed for future reference and use. Training records should reveal the status of training and accomplishments of each individual, company, platoon, or department. The records should be complete enough to tell a true story, but need not be complicated.”

ESCi emphasizes that fire departments should devise a record system that meets the needs of the department. Training records should consist of:

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<sup>42</sup> OSHA CFR 1910.120(q)(6)(ii).

- Daily training records
- Company training records
- Individual training records
- An inventory of equipment assigned to the training department
- A complete reference library

***Cundy's Harbor Volunteer Fire Department***

Training records are maintained for all personnel in the employee jacket / folder including certificates, continuing education, copies of driver's license, and current certifications. Training records are not computerized and all recordkeeping is completed on paper. The training officer does not have access to secretarial support for data entry of any kind. Developed lesson plans are used and on file.

***Harpswell Neck Fire and Rescue***

Training records are maintained for all personnel in the employee jacket / folder including certificates, continuing education, copies of driver's license, and current certifications. The training officer does not have access to secretarial support for data entry of any kind. Developed lesson plans are used and on file.

***Orr's and Bailey Islands Fire Department***

Training records are maintained for all personnel in the employee jacket / folder including certificates, continuing education, copies of driver's license, and current certifications. Training records are not computerized and recordkeeping is completed on paper. The training officer does not have access to secretarial support for data entry. Developed lesson plans are used and on file.

**Recommendation:**

- Continue to enhance cooperative training efforts so that all three departments can utilize and share lesson plans and training schedules across jurisdictions.

## Fiscal Analysis

Financial analysis is an important part of the evaluation of any fire department operation. To this end, ESCi has reviewed the financial program for the Town and the three fire departments serving the jurisdiction. Included in the analysis is the current method the Town and departments use to cost-share fire protection operations and a review of the current budgetary considerations for all the interested agencies.

The Governmental Accounting Standards Board (GASB) is a non-profit organization intended to produce standards that governmental entities should follow to standardize methods of accounting of public funds. Although the volunteer fire departments in Harpswell do not qualify as governmental entities as defined by GASB, the Office of Management and Budget does require federal, state, local, and non-profit agencies to submit to an external audit if more than \$500,000 of federally awarded funds are expended in a fiscal year.<sup>43</sup> Those agencies listed that expend less than \$500,000 of federally awarded funds in a fiscal year are exempt from this requirement, but must maintain records of all funds expended and make these records available to federal agency auditors if requested. In all cases, however, general accounting practices should follow the standards set forth in GASB Statement No. 34, *Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments*.

### Municipal Fiscal Discussion

#### ***Town of Harpswell***

Based on the 2007 Municipal Tax Rate Calculation Form provided by the Town, the total taxable real estate valuation within the municipal limits is \$1,668,145,500.00. In addition, personal property valuation is listed at \$3,500,600.00 for the same period. This results in a total valuation of \$1,671,646,100.00. Additional Homestead Exemptions valuation brings the total valuation to \$1,681,740,900.00. The Town operates on a calendar year budget cycle and utilizes an accrual basis of accounting. Annual external audits are performed and the reports are made available for public inspection.

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<sup>43</sup> Office of Management and Budget (OMB) Circular A-133.

The effective ad valorem tax rate approved at the most recent Town meeting has been set at 0.00607 dollars per \$1,000.00 valuation. Based on information provided, the total revenue for the Town is estimated at \$10,107,302.00 for the upcoming FY 2007.

Although a complete budget summary was provided, this study focuses on emergency services, specifically, fire services provided to the Town. Based on the budget summary provided to ESCi, the total budgeted for FY 2007 dedicated to fire service is \$152,000.00, plus an additional \$16,000.00 for the advanced life support (ALS) EMS contract with Mid Coast Hospital EMS, \$26,248.00 for Cumberland County Communications to provide 9-1-1 service to the Town, and \$2,750 for emergency management services not provided by Cumberland County.

Of the total estimated budget for FY 2007 of \$3,991,511.00, the non-capital expenditures for fire and emergency services represents five percent of the total budget. The figure below illustrates how the funds are distributed among the various departments.

**Figure 75: Emergency Services Funding Distribution**

<b>Department</b>	<b>Funding</b>
Harpswell Neck Fire and Rescue	\$50,000
Orr's and Bailey Islands Fire Department	\$50,000
Cundy's Harbor Volunteer Fire Department	\$50,000
Mid Coast EMS	\$16,000
Dry Hydrant Development	\$12,000
Cumberland County Communications	\$26,248
Emergency Management	\$2,750
<b>Total</b>	<b>\$206,998</b>

In addition to the operational funding indicated above, the Town also assists the local fire departments with capital equipment purchases. The following figure indicates how those capital funds were distributed during FY 2007.

**Figure 76: Capital Equipment Funding Distribution<sup>44</sup>**

<b>Department</b>	<b>Funding</b>
Harpswell Neck Fire and Rescue	\$25,000
Orr’s and Bailey Islands Fire Department	\$25,000
Cundy’s Harbor Volunteer Fire Department	\$25,000
New Brush Truck for OBIFD	\$135,000
<b>Total</b>	<b>\$210,000</b>

Aside from ad valorem taxes collected, the Town has no mechanism in place to recoup emergency services related expenditures. Further, there is no separate fire tax levy and all emergency services funding is blended with ad valorem taxes. In addition to the operational and capital expenditures noted above, the Town provides Workers’ Compensation insurance to all three fire departments, as well as providing those members with Accidental Death and Disability Insurance through the Maine Municipal Association. The figure below identifies those additional costs to the Town.

**Figure 77: Additional Town Funding of Fire Services**

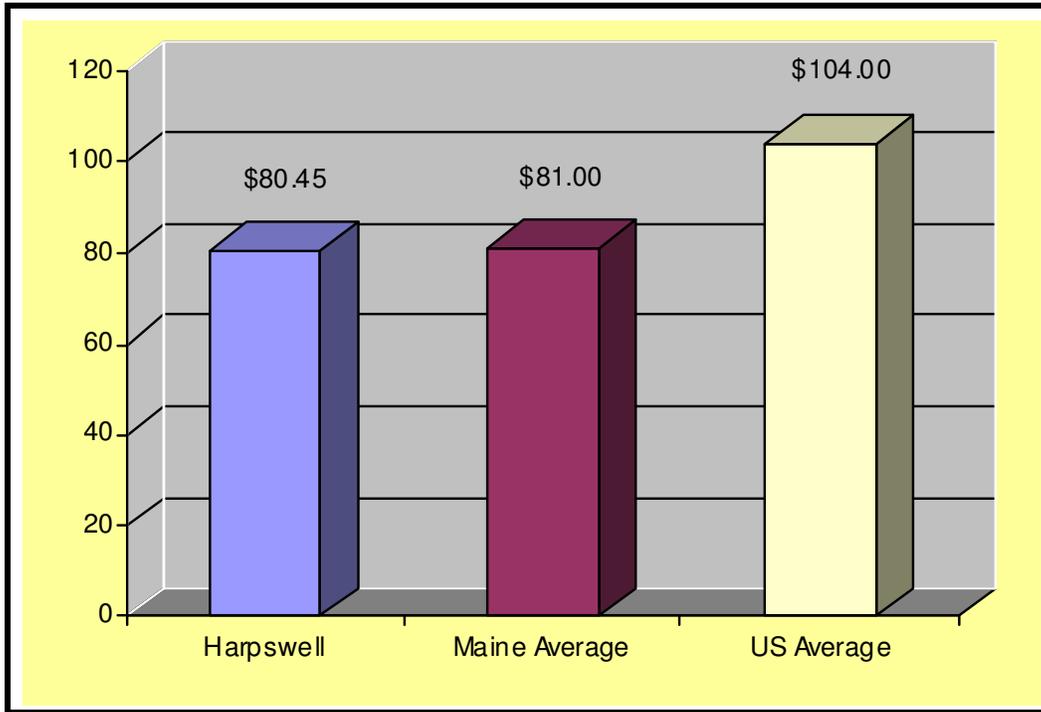
<b>Expense</b>	<b>Funding</b>
Workers’ Compensation	Unknown
Accidental Death and Disability Insurance	\$4,460
<b>Total</b>	<b>&gt;\$4,460</b>

Based on this information, the total expenditure by the Town for the provision of emergency services totals \$421,458.00 for FY 2007, for a total per capita expense of \$80.45. The figure below represents this amount in comparison to the average per capita expense in both the State of Maine and the nation as a whole.

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<sup>44</sup> Harpswell Neck Fire and Rescue was loaned \$75,000.00 to purchase a new engine. That loan will be paid back to the Town through the next three years of HNFR capital share.

Figure 78: Per Capita Spending Comparison



**Fire Departments’ Fiscal Discussion**

***Cundy’s Harbor Volunteer Fire Department***

CHVFD is recognized by the State of Maine as a 501(c)3 not for profit volunteer organization. They operate on a cash basis of accounting and provided detailed financial statements for this study as well as an external accounting review statement from an outside Certified Public Accountant (CPA).

The department receives revenue from several sources, with the largest contributor being the Town. In addition to funding received from Harpswell, CHVFD holds annual fundraisers to supplement the Town’s operational and capital funding. The figure below indicates the estimated revenues for the current fiscal year and how they are distributed.

**Figure 79: Estimated Annual Revenue**

Revenue Source	Amount
Town – Operating	\$50,000
Town – Capital	\$25,000
Donations and Fundraising	\$24,000
EMS Billings	\$0
Interest and Other	\$6,900
<b>Total</b>	<b>\$105,900</b>

Expenses for CHVFD are varied but, for ease of comparison, have been divided into General and Administrative Expenses, Fire and Rescue Operations and Capital. The figure below illustrates how funds are distributed among those three areas.

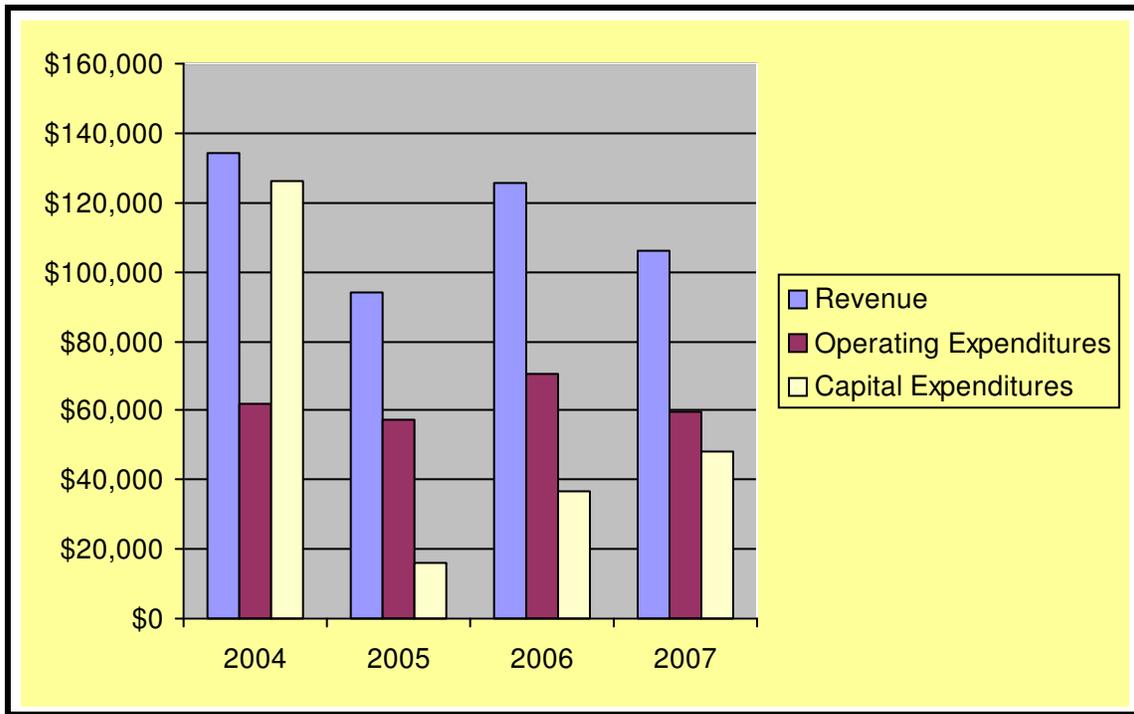
**Figure 80: Estimated Budgetary Expenditures**

Expenditure	Amount
General and Administrative Expenses	\$28,850
Fire and Rescue Operations	\$30,750
<b>Subtotal</b>	<b>\$59,600.00</b>
Capital	\$56,824
<b>Total</b>	<b>\$176,024</b>

\*Average of 2004, 2005, 2006, 2007 capital expenditures.

The figure below shows the trends of both revenue and expenditures for CHVFD over the last four years.

Figure 81: Trended Revenue to Actual Expenditures Comparison<sup>45</sup>



While operating expenses are relatively stable, capital expenditures vary significantly from year to year. Surplus funds accumulated in years with low capital expenditure are used in years with high expenditures. With this annual surplus, CHVFD has been able to build a sizeable fund balance should any unforeseen major expenditures arise. No indication was given that an external audit is routinely performed on the financial transactions and records of the department; however the department treasurer reviews and develops financial statements annually.

### ***Harpswell Neck Fire and Rescue***

HNFR is recognized by the State of Maine as a 501(c)3 not for profit volunteer organization. They operate on a cash basis of accounting and provided detailed financial statements for this study.

The department receives revenue from several sources with the largest contributor being the Town. In addition to funding received from the Town, HNFR also charges for ambulance transports and holds annual fundraisers to supplement the Town's operational funding. The

<sup>45</sup> Fiscal year 2007 is included, but not yet fully collected or expended at the time of this report. Capital expenditures were not provided other than those combined within the aforementioned line items within operations.

figure below indicates the estimated revenues for the current fiscal year and how they are distributed.

**Figure 82: Estimated Annual Revenue**

<b>Revenue Source</b>	<b>Amount</b>
Town – Operating	\$50,000
Town – Capital	\$25,000
Donations and Fundraising	\$30,000
EMS Billings	\$26,750
Interest and Other	\$2,650
<b>Total</b>	<b>\$134,400</b>

Expenses for HNFR are varied but, for ease of comparison, have been divided into General and Administrative Expenses, Fire and Rescue Operations and Capital. The figure below illustrates how funds are distributed among those three areas.

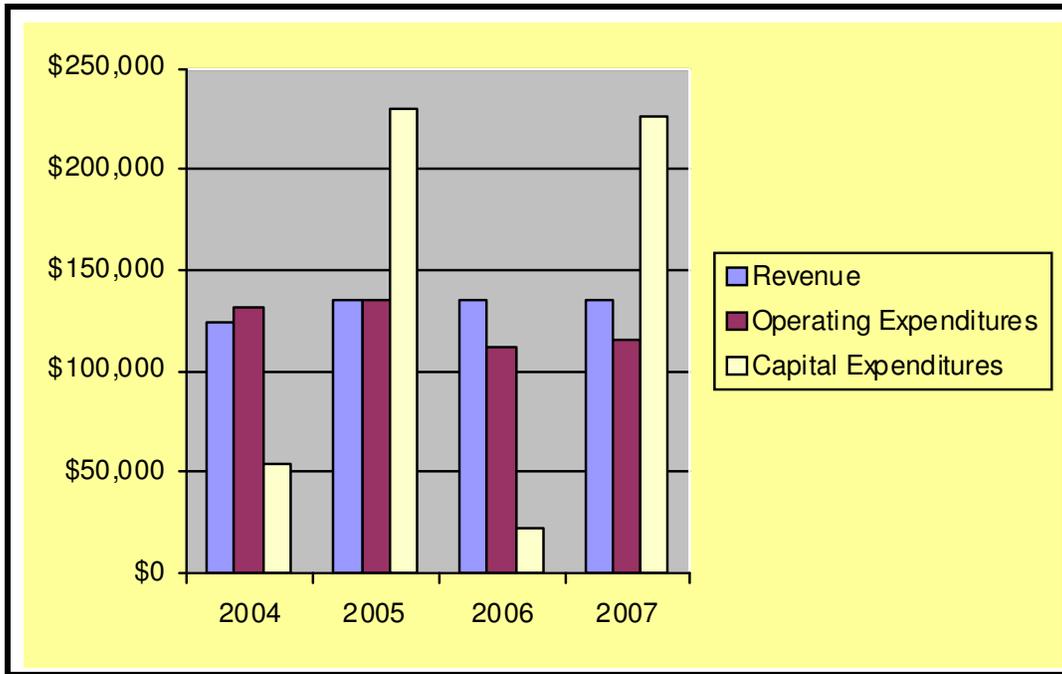
**Figure 83: Estimated Budgetary Expenditures**

<b>Expenditure</b>	<b>Amount</b>
General and Administrative Expenses	\$60,750
Fire and Rescue Operations	\$54,900
<b>Subtotal</b>	<b>\$115,650.00</b>
Capital*	\$133,250
<b>Total</b>	<b>\$248,900</b>

\*Average of 2004, 2005, 2006, 2007 capital expenditures.

The figure below shows the trends of both revenue and expenditures for HNFR over the last four years.

Figure 84: Trended Revenue to Budget Comparison<sup>46</sup>



As indicated, operating expenses are relatively stable and capital expenditures vary significantly from year to year. Surplus funds accumulated in years with low capital expenditure are used in years with high expenditures. With this annual surplus, HNFR has been able to build a sizeable fund balance should any unforeseen major expenditures arise. The only debt that the department maintains is the loan from the Town for the purchase of a pumper/engine.

No indication was given that an external audit is routinely performed on the financial transactions and records of the department; however a CPA annually reviews and develops financial statements for the department.

### ***Orr's and Bailey Islands Fire Department***

OBIFD is recognized by the State of Maine as a 501(c)3 not for profit volunteer organization. They operate on a cash basis of accounting and provided simple financial records for this study.

The department receives revenue from several sources, with the largest contributor being the Town. In addition to funding received from the Town, OBIFD also holds annual fundraisers to

<sup>46</sup> After 2003, capital expenditures were removed from the regular budget. Capital expense reports were not provided for this study. This chart also does not show the federal grant received in 2006 for \$252,010.

supplement the Town’s operational funding. The figure below indicates the estimated revenues for the upcoming fiscal year and how they are distributed.

**Figure 85: Estimated Annual Revenue**

<b>Revenue Source</b>	<b>Amount</b>
Town – Operating	\$50,000
Town – Capital	\$25,000
Donations and Fundraising	\$85,000
EMS Billings	\$0
Interest and Other	\$8,000
<b>Total</b>	<b>\$168,000</b>

Expenses for OBIFD are varied but, for ease of comparison, have been divided into General and Administrative Expenses, Fire and Rescue Operations and Capital. The figure below illustrates how funds are distributed among those three areas.

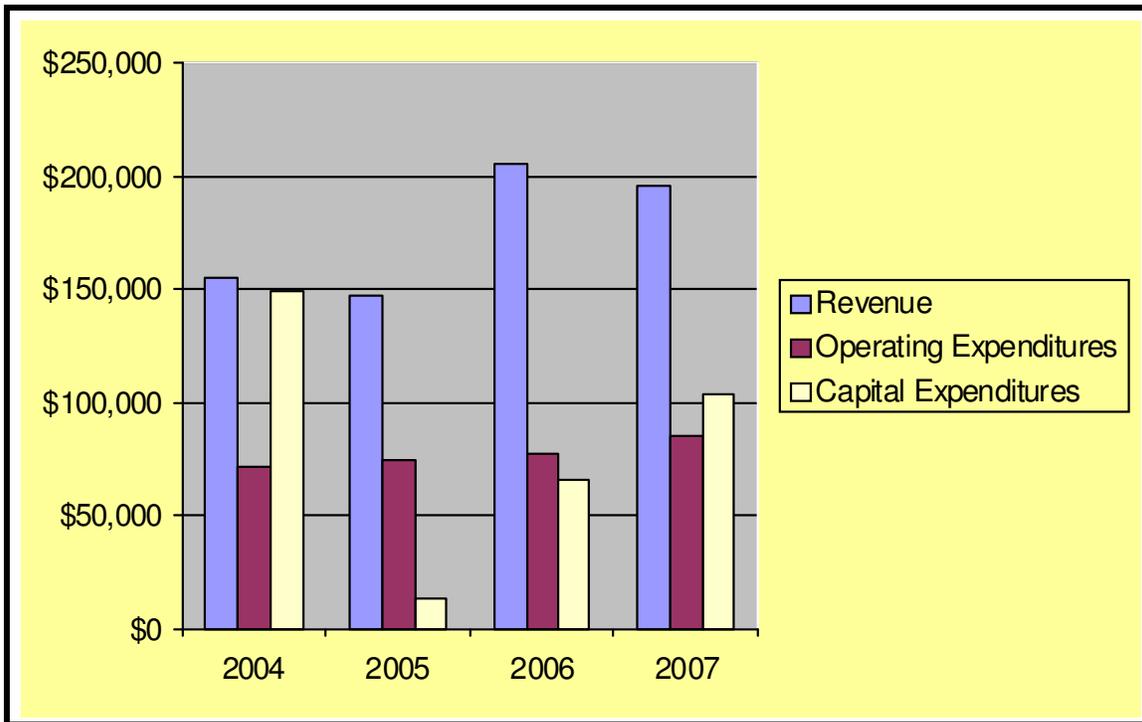
**Figure 86: Estimated Budgetary Expenditures**

<b>Expenditure</b>	<b>Amount</b>
General and Administrative Expenses	\$51,260
Fire and Rescue Operations	\$54,502
<b>Subtotal</b>	<b>\$105,762.00</b>
Capital*	\$82,804
<b>Total</b>	<b>\$188,566</b>

\*Average of 2004, 2005, 2006, 2007 capital expenditures.

The figure below shows the trends of both revenue and expenditures for OBIFD over the last four years.

Figure 87: Trended Revenue to Budget Comparison



As with the other departments, operating expenses are relatively stable and capital expenditures vary significantly from year to year. Surplus funds accumulated in years with low capital expenditure are used in years with high expenditures. With this annual surplus, OBIFD has been able to build a sizeable fund balance should any unforeseen major expenditures arise. The department's only debt is \$75,351 (as of this report) for new Engine 3.

No indication was given that an external audit is routinely performed on the department's financial transactions and records, although an informal audit was conducted in May of 2005, which found no GASB reportable conditions.

**Recommendation:**

- To ensure financial integrity and maintain public confidence, each department should periodically submit to a complete external audit, performed in accordance with GASB standards for those agencies receiving federal awards funding.

## APPENDIX A: Table of Recommendations

The recommendations found in the report have been compiled into a prioritized list for easy reference. The prioritization system is as follows:

1. **Immediate Internal Life Safety**

The objective deals with an improvement or initiative that solves an issue affecting the safety of firefighters and/or other department personnel. These are not matters that simply make it easier to do a particular function, but in fact make a currently unsafe situation, safe. For example, using self contained breathing apparatus (SCBAs) that have not passed service tests.

2. **Legal or Financial Exposure**

The objective resolves a situation that is creating, or is likely to create, the opportunity for legal action against the department or its members. It may also be a situation that could subject the department to a significant expense, such as resolving a leaking underground storage tank.

3. **Corrects a Service Delivery or Management Issue**

This objective addresses a service delivery situation that, while it doesn't create an immediate safety risk to personnel or the public, does affect the department's ability to deliver service or maintain service in accordance with its standards of performance. For example, adding a response unit to compensate for a growing response workload, or delivering training needed to allow personnel to deal effectively with emergency responses already being encountered.

4. **Enhances the Delivery of Service or Department Management**

This objective improves the delivery of a particular service. For example, relocating a fire station to improve response times to a particular part of town, or adding a specialized piece of equipment that will improve the delivery of a service.

5. **A Good Thing To Do**

The objective doesn't fit within any of the above priorities, but is still worth doing.

**PRIORITY ONE - Immediate Internal Life Safety**

No recommendations of this type were found during the study

**PRIORITY TWO - Legal or Financial Exposure**

- ESCi recommends that service contracts between the Town and the volunteer fire departments be prepared. ESCi believes the contract should include, at a minimum, a set of performance standards and an obligation to operate within all laws and regulations.....13
- The Town should purchase equipment through a competitive bid process. ....95
- Cundy’s Harbor Volunteer Fire Department should establish a written disciplinary policy. ....124
- All departments should adopt *NFPA 1582* and implement a system of initial physical testing prior to active suppression activities, as well as periodic physical and respiratory evaluations. ....127
- All departments should train firefighters in hazardous materials to the operations level as outlined by OSHA 1910.120. ....135
- To ensure financial integrity and maintain public confidence, each department should periodically submit to a complete external audit, performed in accordance with GASB standards for those agencies receiving federal awards funding.....146

**PRIORITY THREE - Corrects a Service Delivery or Management Issue**

- Develop a program to replace vehicles through the recommended capital improvement plan funded by the Town. ....88
- The Town should enter into an agreement with the fire departments to purchase capital vehicles that meet the Town’s needs.....95
- The Town should develop consistency among the departments in regards to the types of vehicles purchased and the equipment to be included in the vehicle purchase, considering individual department needs.....95
- Form a Community Emergency Response Team to supplement the local fire departments during times of disaster.....110

**PRIORITY FOUR - Enhances the Delivery of Service or Department Management**

- The fire departments should complete accurate calculations of their normal tanker shuttle capability, using tested load and offload times and true capacity (based on weight testing). Maps can be generated using established water points in the Town, color-coded to demonstrate GPM flow capability. ....69
- The Town of Harpswell should continually recognize the criticality of GPM flow and the proximity of water points as it considers new development or redevelopment areas. The Town is in the best position to require installation of adequate and plentiful water points through land use regulations and permit processes.....69
- Develop specifications for new apparatus based on specific Town needs and condition of community streets and access ways.....88
- Based on the travel time of Brunswick Fire Department, the Town should consider entering into an inter-local government agreement for Brunswick to provide *first-due* service to the extreme northern sections of the Town.....99
- Establish a volunteer retention, recruitment program region-wide using, for example, concepts found in the appendix on *Staffing Needs and Volunteer Sustainability*. .....127

**PRIORITY FIVE - Represents Industry Best Practice (A Good Thing To Do)**

- Begin purchasing apparatus through a collaborative effort and competitive bid process. ....88
- The Town should maintain ownership of all vehicles purchased with public funds.....95
- The Town should appoint a capital replacement committee consisting of fire department representatives, as well as elected officials for balance.....95
- The vehicle committee should determine specifications for all vehicle purchases.....95
- Approval of specifications should rest with the Town Selectmen. ....95
- Although each department has proud traditions related to their various benefit and compensation programs, some standardization between the three departments may be advisable so that each geographical area offers similar opportunities for volunteer recruitment and retention incentives. The desired outcome is to ensure that any lack of compensation or benefits in one department, when compared to another, does not become a disincentive for members or potential members. ....124
- Develop a standard disciplinary process utilized and followed by all three departments serving the Town. ....124

- If the Town, at some point, determines the need to implement an EAP, such services should be offered to the volunteer fire departments as well. .... 125
- Standardize volunteer qualifications, requirements, and application process for participation in service delivery for all Harpswell fire departments. .... 127
- All Harpswell fire departments should consider establishing a formal annual physical abilities evaluation and skill competency demonstration for emergency response personnel. .... 128
- The fire departments should provide all personnel with some form of simple, basic performance evaluations at least annually..... 128
- A joint safety committee should be implemented with representation from each of the three departments. .... 129
- Consider providing various training opportunities beyond the basic skill sets that could include officer development, specialized skill training, fire investigation, public education, etc., based on the current needs of the community. Such opportunities often provide motivation for newer members seeking to expand their skill set..... 135
- Implement the use of proficiencies and competency standards, and test firefighters and EMS personnel annually to that established standard. .... 135
- Continue to enhance cooperative training efforts so that all three departments can utilize and share lesson plans and training schedules across jurisdictions..... 136

## APPENDIX B: Original Request for Proposal (RFP)

### Request for Proposals Town of Harpswell, Maine – Fire & Rescue Services Study Capital, Operations, and Strategic Planning June 14, 2007

The Town of Harpswell invites qualified individuals and companies to submit proposals for professional services to conduct a comprehensive analysis and study of the three organizations that provide emergency services for Harpswell with emphasis on long-term vehicle needs and strategies for the continued effective delivery of emergency services.

Proposals must be submitted to Kristi Eiane, Town Administrator, no later than **4:30 PM, July 12, 2007 EST**. Proposals must be sealed and labeled “RFP – Fire & Rescue Services Study, Attention: Town Administrator.”

#### Introduction

The Town of Harpswell operates under a Board of Selectmen–Town Administrator–Town Meeting form of government. Fire and Emergency Medical Services are provided by three independent fire and rescue organizations. The Town welcomes the conduct of a comprehensive analysis of these services including but not limited to long-term vehicle needs, operations, demand and risk types, geographic location and effectiveness, management, volunteer sustainability, and strategic planning.

This analysis requires the participation of representatives of each service provider and of other interested parties including Elected Officials, Town Administrator, Town Treasurer, and an Emergency Services Study Committee. The study shall seek to obtain information that could assist the Town and its three fire and rescue organizations in identifying potential economies of scale and in considering possible consolidations and regional resources with respect to vehicle needs and operational expenses. The Town is sensitive to the autonomy of its all-volunteer emergency service providers, but at the same time is concerned about the sustainability of these volunteer efforts and would like to identify steps that would further extend such efforts.

The Town is interested in obtaining the services of a qualified individual or company to provide these services, however, the Town reserves the right to reject any and all responses or to retain services from other individuals or companies for related projects/services at any time.

#### Community and Department Profiles

Harpswell, Maine, located on the coast, is adjacent to Brunswick, Maine. It is primarily a residential community with a year-round population of approximately 5,300, and a substantial seasonal population that increases the total population to 8,000 – 10,000. The Town covers approximately 24 square miles and has approximately 216 miles of coastline with several outlying islands accessible only by water. There are a number of small businesses in the Town, many marine or commercial fishing related. Housing stock ranges from small seasonal camps and older historic buildings to substantial new structures, many used primarily as seasonal dwellings. The population of the Town has been steadily aging.

As shown on the attached map, Harpswell consists of one long peninsula, Harpswell Neck, three connected islands, Great Island, Orr's Island, and Bailey Island, and several outlying islands, accessible only by water. Because of this unique geography, Harpswell is served by three separate, independent volunteer fire and rescue departments. Harpswell Neck Fire Department (HNFD) serves Harpswell Neck. Orr's & Bailey Islands Fire Department (OBIFD) serves Orr's & Bailey Islands and the western portion of Great Island. Cundy's Harbor Volunteer Fire Department (CHVFD) serves the remainder of Great Island.

All three departments are non-profit corporations with their own board of directors, fire chief, rescue captain, and roster of 25 to 30 volunteers at each department. HNFD and CHVFD have a single fire station each while OBIFD maintains two stations, a requirement of the 1987 merger agreement between the previously separate Orr's Island and Bailey Island departments. The departments routinely carry out joint training exercises and have informal and formal mutual aid agreements with each other, departments in nearby towns, and the Brunswick Naval Air Station.

The Town has no public water supply. All departments rely on tanker transport from dry hydrants and water storage tanks. A current vehicle inventory is shown in the table below:

<u>HNFD</u>	<u>OBIFD</u>	<u>CHVFD</u>
Ambulance	Ambulance	Ambulance
Pumper (2)	Pumper (2)	Pumper
Pumper/Tanker	Tanker	Tanker
Tanker	Utility/Rescue	Utility/Rescue
	Brush Truck	

The Town of Harpswell has historically provided annual funding to each department for a portion of their operating and capital expenses. The remainder of each department's budget comes from donations, fundraising events, and grants.

### Services

The intent of this project is to develop an objective set of comprehensive recommendations that, if adopted, would fulfill the long-term emergency vehicle needs of and promote the effective and efficient delivery of emergency services in the Town.

The scope of this project shall include at a minimum the following:

- A. Extensive review of vehicle needs for fire and rescue at each of the departments' locations and a recommended replacement schedule that considers possible economies of scale and consolidations. The departments have collectively submitted a 20-year capital vehicle replacement plan which should be reviewed and evaluated by an independent, objective professional entity.
- B. Analysis of individual department operations including apparatus, station effectiveness, and short and long-term staffing and training needs.

- C. Evaluation of current and proposed capabilities against ISO, NFPA and other relevant standards.
- D. At least one facilitated discussion with representatives of all three departments, Town staff, elected officials and interested citizens to elaborate on the issues raised through the survey process as well as to target future goals/strategies and recommendations for consideration. The facilitated discussion shall emphasize the importance of participation from various entities.
- E. Periodic meetings with the Emergency Services Study Committee to review data, findings and eventual recommendations.

Comprehensive plan, census, and emergency incident data will be available to the selected firm along with access to Town staff and elected officials, and volunteers at the three departments. Participation by citizens, former elected officials, and other interested parties such as county and school district officials, and local business interests is also encouraged.

**Deliverables**

The selected firm shall be responsible for providing an extensive written report to the Town that includes the data and methodology that form the basis of its professional recommendations. The report shall address recommendations for collaboration by the three departments as well as between the three departments and the Town in moving forward on issues of both short- and long-term consequence. The final report shall include detailed responses to all of the items listed in the Service Section of this RFP along with recommendations on desired service level goals, evaluation of the condition and remaining useful life of existing vehicles, a proposed vehicle replacement program, manpower planning strategies, opportunities for consolidation, suggestions for regional considerations, and options for deployment of vehicles and manpower.

There shall be a final public presentation to the Town, department officials, the Emergency Services Study Committee and other interested parties.

The Town anticipates that the study will take approximately three to five months from the expected award date in late July. Final report and recommendations must be received by the Town no later than December 21, 2007.

**Minimum RFQ Submittal Requirements**

Eight copies of the complete proposal are required.

1. Name, address, and brief description of the business entity. This may include a brochure about the firm.
2. Qualifications to undertake this project. If the firm intends to use other firms for specialized services, the qualifications must include information on the other firms to be used.

3. A listing of projects done by the firm that demonstrates the firm's capabilities.
4. A list of clients that the firm has recently worked with in a similar capacity, including governmental, quasi-governmental, and commercial entities. The list should include the name, address, and telephone number for each client.
5. Profiles of key personnel to be involved in the design, execution, and delivery of this project.
6. A statement of current workload and demonstration that the firm is capable of taking on additional work.
7. A proposed work plan with detailed timetable.
8. A comprehensive schedule of fees and expenses and an estimate for the total hours, fees, and cost to the Town with a not-to-exceed amount.
9. Any additional information believed to be useful in the evaluation of the firm's qualifications.

**Selection Process**

Town staff and representatives of the Fire and Rescue Chiefs Workgroup shall (1) screen responding firms to determine interview selections, (2) conduct interviews, and (3) make an advisory recommendation to the Board of Selectmen. Interview selections and recommendation shall be based on qualifications, responsiveness to the RFP, proposed work scope, timeframe for completion, and pricing. Final authorization to select and contract rests with the Board of Selectmen.

**Tentative Selection Process Schedule**

- Proposals Due: July 12, 2007
- Interviews: July 16 – 20, 2007
- Firm Selected: July 26, 2007

## APPENDIX C: Fire Station Surveys

Station Name/Number: Cundy's Harbor Fire Station

Address: 837 Cundy's Harbor Road

Building Size 6200 Sq Ft Year Built 1955 No. of Stories 2

Number of Drive-Thru Bays 0 Number of Back-In Bays 4

Comments on overall appearance of building and setting:

Modest community building in quiet residential neighborhood.

### **Construction Issues:**

Construction Type Masonry block/wood frame

Roof Type pitched, shingle Roof Condition good

Unusual Construction Features apparatus bays beneath large community meeting hall

Heating System and Fuel Type: forced air/oil

Air Conditioning: Percent of building? 0% Type:  Window  Central

Maintenance and Disrepair Issues:

None noted

### **Design Issues:**

Size of facility adequate for current use?  Y  N

Apparatus exit to traffic flow safe and effective?  Y  N

If no, describe issue: challenges to sight distance toward north

Blends well with surrounding area?  Y  N

Structure adaptable to future needs of community?  Y  N

Adequate parking for staff and visitors?  Y  N

Design Comments:

Building has undergone several expansions or changes. Community hall is maintained upstairs an available for public rental for events. Downstairs area is very basic fire station with limited staff areas.

Station Name/Number: **Cundy's Harbor Fire Station**

**Code Issues:**

ADA Compliant:  Y  N ADA Issues: upstairs hall is ADA compliant,  
downstairs fire station is not likely compliant.

Building Code Issues Noted:

Exposed electrical wiring/junction in rear of bays

**Safety Issues:**

Automatic door stops operating properly?  Y  N

Automatic Sprinklers  Y  N 100% of building  Wet  Dry

Sprinkler Inspection / Maintenance Contract  Y  N

Alarms:

Sprinkler Water Flow?  Y  N

Smoke Detection Local?  Y  N

Heat Detection Local?  Y  N

Smoke/Heat Monitored?  Y  N

Security Monitored?  Y  N

Adequate building fire extinguishers not on apparatus?  Y  N

Cooking equipment central point shut down in place?  Y  N

Commercial cooking equipment present?  Y  N

If yes, proper hood, duct, and grease filters in place?  Y  N

Fixed Fire Extinguishing Systems Present  Y  N Last Inspection current

Flammable and combustible liquids in approved storage  Y  N

If no, list improper location of flammable/combustibles \_\_\_\_\_

Pressure cylinders properly stored?  Y  N

If no, list improper location of pressure cylinders \_\_\_\_\_

SCBA Compressor?  Y  N Air Samples Certified?  Y  N

Back-up Generator?  Y  N Automatic Transfer?  Y  N

Generator fuel type and source? \_\_\_\_\_

Station Name/Number: Cundy's Harbor Fire Station

**Environment Issues:**

Apparatus exhaust removal system?  Y  N

Type: Passive Forced Air Flow  Direct Connect

Evidence of regular use?  Y  N

Underground Storage Tanks?  Y  N Meet UST Standards?  Y  N

Method used to detect tank leakage? \_\_\_\_\_

Apparatus floor drain oil separation in use?  Y  N

Other Environmental Issues:

None noted

**Staff Facilities Issues:**

Adequate space for working in, on and around apparatus?  Y  N

Adequate space for working on small equipment, hose, tools, etc.?  Y  N

Adequate space for safe and rapid response turnout?  Y  N

Adequate space for cooking and eating?  Y  N

Adequate space for training and company drills?  Y  N

Adequate space for personal hygiene?  Y  N

Adequate space for sleeping?  Y  N

Compromises necessary for two-gender staffing?  Y  N

List any staff facility issues or compromises made by crew to compensate for facility inadequacies:

No showers in facility. No sleeping quarters, but could accommodate sleeping in disaster. Would need additional space renovation for on-duty staffing.

**Efficiency Issues:**

Describe any efficiency issues worth noting:

Lack of interior stairwell between downstairs fire station and upstairs classroom/meeting room and kitchen

<b>Station Name/Number: <u>Cundy's Harbor Fire Station</u></b>		
<b>Station Amenities</b>	<b>Number</b>	<b>Comments</b>
Dept. Administrative Offices	0	
Station Watch Room/ Offices	1	
Communications / Dispatch	0	
Conference / Classroom	1	large social hall used for classroom
Training Library	0	
Day Room / Lounge Area	0	
Kitchen	1	in social hall
Male Dormitory Sleep #	0	
Female Dormitory Sleep #	0	
Co-ed Dormitory Sleep #	0	
Male Restroom/Shower/Locker	1	no shower
Female Restroom/Shower/Locker	1	no shower
Co-ed Restroom/Shower/Locker	1	
Exercise / Work Out Area	0	
Back-In Bays	4	extra-length bays
Drive-Through Bays	0	
SCBA Fill Station	0	
Laundry – Gear Extractor	0	
Laundry – Residential Type	0	
Turn Out Gear Room	0	
Storage Area	3	

Station Name/Number: Harpswell Neck VFD

Address: 1426 Harpswell Neck Road

Building Size 6132 Sq Ft Year Built 1950 No. of Stories 2

Number of Drive-Thru Bays 0 Number of Back-In Bays 4

Comments on overall appearance of building and setting:

Older building, revised several times with additions

**Construction Issues:**

Construction Type wood frame, steel frame

Roof Type pitched/flat rubberized Roof Condition Good

Unusual Construction Features two major additions

Heating System and Fuel Type: forced air, oil

Air Conditioning: Percent of building? 0% Type:  Window  Central

Maintenance and Disrepair Issues:

Some renovation of kitchen and turnout gear room currently underway

**Design Issues:**

Size of facility adequate for current use?  Y  N

Apparatus exit to traffic flow safe and effective?  Y  N

If no, describe issue: limited site distances, particularly to right

Blends well with surrounding area?  Y  N

Structure adaptable to future needs of community?  Y  N

Adequate parking for staff and visitors?  Y  N

Design Comments:

Lack of paved parking. Building was not initially designed for current capacity and use, but has been reasonably expanded in phases. Not designed for on-duty staffing or 24 hour occupancy.

Station Name/Number: Harpswell Neck VFD

**Code Issues:**

ADA Compliant:  Y  N ADA Issues: door/bathroom hdwr, 2<sup>nd</sup> floor access

Building Code Issues Noted:

No rated separations between apparatus bays and staff areas/offices

**Safety Issues:**

Automatic door stops operating properly?  Y  N

Automatic Sprinklers  Y  N \_\_\_\_\_% of building  Wet  Dry

Sprinkler Inspection / Maintenance Contract  Y  N

**Alarms:**

Sprinkler Water Flow?  Y  N

Smoke Detection Local?  Y  N

Heat Detection Local?  Y  N

Smoke/Heat Monitored?  Y  N

Security Monitored?  Y  N

Adequate building fire extinguishers not on apparatus?  Y  N

Cooking equipment central point shut down in place?  Y  N

Commercial cooking equipment present?  Y  N

If yes, proper hood, duct, and grease filters in place?  Y  N

Fixed Fire Extinguishing Systems Present  Y  N Last Inspection \_\_\_\_\_

Flammable and combustible liquids in approved storage  Y  N

If no, list improper location of flammable/combustibles no combustible/flammable storage cabinet

Pressure cylinders properly stored?  Y  N

If no, list improper location of pressure cylinders \_\_\_\_\_

SCBA Compressor?  Y  N Air Samples Certified?  Y  N

Back-up Generator?  Y  N Automatic Transfer?  Y  N

Generator fuel type and source? propane, five storage cylinders

Station Name/Number: Harpswell Neck VFD

**Environment Issues:**

Apparatus exhaust removal system?  Y  N

Type: Passive Forced Air Flow  Direct Connect

Evidence of regular use?  Y  N

Underground Storage Tanks?  Y  N Meet UST Standards?  Y  N

Method used to detect tank leakage? \_\_\_\_\_

Apparatus floor drain oil separation in use?  Y  N

Other Environmental Issues:

None noted

**Staff Facilities Issues:**

Adequate space for working in, on and around apparatus?  Y  N

Adequate space for working on small equipment, hose, tools, etc.?  Y  N

Adequate space for safe and rapid response turnout?  Y  N

Adequate space for cooking and eating?  Y  N

Adequate space for training and company drills?  Y  N

Adequate space for personal hygiene?  Y  N

Adequate space for sleeping?  Y  N

Compromises necessary for two-gender staffing?  Y  N

List any staff facility issues or compromises made by crew to compensate for facility inadequacies:

Facility is adequate for volunteer or on-call response use. Facility is not designed for consistent on-duty staffing or 24-hour occupancy. Some areas of the apparatus bays are somewhat cluttered and cramped with limited movement around apparatus.

**Efficiency Issues:**

Describe any efficiency issues worth noting:

Rear storage area where antique truck is located is cluttered with significant storage of old, outdated or unuseable equipment. This area could be much better used and could, perhaps, accommodate storage of some items currently cluttering the apparatus bays.

**Station Name/Number: Harpswell Neck VFD**

<b>Station Amenities</b>	<b>Number</b>	<b>Comments</b>
Dept. Administrative Offices	0	
Station Watch Room/ Offices	1	
Communications / Dispatch	1	Back up only
Conference / Classroom	1	
Training Library		
Day Room / Lounge Area		
Kitchen	1	
Male Dormitory Sleep #	0	
Female Dormitory Sleep #	0	
Co-ed Dormitory Sleep #	0	
Male Restroom/Shower/Locker	0	
Female Restroom/Shower/Locker	0	
Co-ed Restroom/Shower/Locker	1	Shower in utility room across hall
Exercise / Work Out Area	0	
Back-In Bays	4	2 are double-length
Drive-Through Bays	0	
SCBA Fill Station	0	
Laundry – Gear Extractor	0	
Laundry – Residential Type	1	
Turn Out Gear Room	1	
Storage Area	3	

Station Name/Number: Orr's Island Station

Address: 1600 Harpswell Islands Road

Building Size 6240 Sq Ft Year Built 1987 No. of Stories 2

Number of Drive-Thru Bays 0 Number of Back-In Bays 3

Comments on overall appearance of building and setting:

Somewhat large parcel with three-building complex owned by fire department. Includes a renovated former schoolhouse now used as an event building for public access and rental. Other building is a large storage barn. Quiet, rural residential area.

**Construction Issues:**

Construction Type wood frame

Roof Type pitched, shingle Roof Condition good

Unusual Construction Features \_\_\_\_\_

Heating System and Fuel Type: forced air, oil

Air Conditioning: Percent of building? 0% Type:  Window  Central

Maintenance and Disrepair Issues:

None noted

**Design Issues:**

Size of facility adequate for current use?  Y  N

Apparatus exit to traffic flow safe and effective?  Y  N

If no, describe issue: limited site distances left and right

Blends well with surrounding area?  Y  N

Structure adaptable to future needs of community?  Y  N

Adequate parking for staff and visitors?  Y  N

Design Comments:

All buildings are modest and well-kept with a pleasant appearance.

Station Name/Number: Orr's Island Station

**Code Issues:**

ADA Compliant:  Y  N ADA Issues: second floor access, door hardware

Building Code Issues Noted:

No rated separation between apparatus bay and staff areas. Fueling facility inside structure.

**Safety Issues:**

Automatic door stops operating properly?  Y  N

Automatic Sprinklers  Y  N \_\_\_\_\_% of building  Wet  Dry

Sprinkler Inspection / Maintenance Contract  Y  N

**Alarms:**

Sprinkler Water Flow?  Y  N

Smoke Detection Local?  Y  N

Heat Detection Local?  Y  N

Smoke/Heat Monitored?  Y  N

Security Monitored?  Y  N

Adequate building fire extinguishers not on apparatus?  Y  N

Cooking equipment central point shut down in place?  Y  N

Commercial cooking equipment present?  Y  N

If yes, proper hood, duct, and grease filters in place?  Y  N

Fixed Fire Extinguishing Systems Present  Y  N Last Inspection \_\_\_\_\_

Flammable and combustible liquids in approved storage  Y  N

If no, list improper location of flammable/combustibles no flammable/combustible liquid storage cabinet

Pressure cylinders properly stored?  Y  N

If no, list improper location of pressure cylinders \_\_\_\_\_

SCBA Compressor?  Y  N Air Samples Certified?  Y  N

Back-up Generator?  Y  N Automatic Transfer?  Y  N

Generator fuel type and source? propane

Station Name/Number: Orr's Island Station

**Environment Issues:**

Apparatus exhaust removal system?  Y  N

Type: Passive Forced Air Flow  Direct Connect

Evidence of regular use?  Y  N

Underground Storage Tanks?  Y  N Meet UST Standards?  Y  N

Method used to detect tank leakage? \_\_\_\_\_

Apparatus floor drain oil separation in use?  Y  N

Other Environmental Issues:

None noted

**Staff Facilities Issues:**

Adequate space for working in, on and around apparatus?  Y  N

Adequate space for working on small equipment, hose, tools, etc.?  Y  N

Adequate space for safe and rapid response turnout?  Y  N

Adequate space for cooking and eating?  Y  N

Adequate space for training and company drills?  Y  N

Adequate space for personal hygiene?  Y  N

Adequate space for sleeping?  Y  N

Compromises necessary for two-gender staffing?  Y  N

List any staff facility issues or compromises made by crew to compensate for facility inadequacies:

Building designed for on-call staffing only. Would need modification for on-duty, 24-hour staffing, but probably adequate space if necessary. Single bathroom available for sharing by both genders.

**Efficiency Issues:**

Describe any efficiency issues worth noting:

Building and bays are crowded by significant amounts of old, outdated equipment or supplies, much of which was described as surplus. Elimination or sale of surplus material could free up significant amounts of space around the station and equipment.

**Station Name/Number: Orr's Island Station**

<b>Station Amenities</b>	<b>Number</b>	<b>Comments</b>
Dept. Administrative Offices	1	also serves as conference room
Station Watch Room/ Offices	1	
Communications / Dispatch	1	radio equipment room
Conference / Classroom	1	
Training Library	0	
Day Room / Lounge Area	0	
Kitchen	1	small kitchenette
Male Dormitory Sleep #	0	
Female Dormitory Sleep #	0	
Co-ed Dormitory Sleep #	0	
Male Restroom/Shower/Locker	0	
Female Restroom/Shower/Locker	0	
Co-ed Restroom/Shower/Locker	1	no shower
Exercise / Work Out Area		in classroom
Back-In Bays	3	2 are double-length
Drive-Through Bays	0	
SCBA Fill Station	1	
Laundry – Gear Extractor	0	
Laundry – Residential Type	0	
Turn Out Gear Room	0	
Storage Area	3	
Outbuilding storage	1	large two-story storage barn
Outbuilding rental hall	1	renovated schoolhouse with commercial kitchen,

Station Name/Number: **Bailey Island Station**

Address: **2094 Harpswell Islands Road**

Building Size 1200 Sq Ft Year Built 2001 No. of Stories 1

Number of Drive-Thru Bays 0 Number of Back-In Bays 2

Comments on overall appearance of building and setting:

Small, conservative building with professional, low-key appearance

**Construction Issues:**

Construction Type wood frame

Roof Type pitched, shingle Roof Condition good

Unusual Construction Features 38,000 gallon water cistern for area fire supply

Heating System and Fuel Type: forced air/gas

Air Conditioning: Percent of building? 0% Type:  Window  Central

Maintenance and Disrepair Issues:

Newer facility, good condition

**Design Issues:**

Size of facility adequate for current use?  Y  N

Apparatus exit to traffic flow safe and effective?  Y  N

If no, describe issue: \_\_\_\_\_

Blends well with surrounding area?  Y  N

Structure adaptable to future needs of community?  Y  N

Adequate parking for staff and visitors?  Y  N

Design Comments:

Simple design intended primarily for apparatus parking only. No running water in building, no bathrooms

Station Name/Number: **Bailey Island Station**

**Code Issues:**

ADA Compliant:  Y  N ADA Issues: door hardware

Building Code Issues Noted:

None noted.

**Safety Issues:**

Automatic door stops operating properly?  Y  N

Automatic Sprinklers  Y  N \_\_\_\_\_% of building  Wet  Dry

Sprinkler Inspection / Maintenance Contract  Y  N

**Alarms:**

Sprinkler Water Flow?  Y  N

Smoke Detection Local?  Y  N

Heat Detection Local?  Y  N

Smoke/Heat Monitored?  Y  N

Security Monitored?  Y  N

Adequate building fire extinguishers not on apparatus?  Y  N

Cooking equipment central point shut down in place?  Y  N

Commercial cooking equipment present?  Y  N

If yes, proper hood, duct, and grease filters in place?  Y  N

Fixed Fire Extinguishing Systems Present  Y  N Last Inspection \_\_\_\_\_

Flammable and combustible liquids in approved storage  Y  N

If no, list improper location of flammable/combustibles NA

Pressure cylinders properly stored?  Y  N

If no, list improper location of pressure cylinders \_\_\_\_\_

SCBA Compressor?  Y  N Air Samples Certified?  Y  N

Back-up Generator?  Y  N Automatic Transfer?  Y  N

Generator fuel type and source? \_\_\_\_\_

Station Name/Number: **Bailey Island Station**

**Environment Issues:**

Apparatus exhaust removal system?  Y  N

Type: Passive Forced Air Flow  Direct Connect

Evidence of regular use?  Y  N

Underground Storage Tanks?  Y  N Meet UST Standards?  Y  N

Method used to detect tank leakage? propane storage, pressure guage

Apparatus floor drain oil separation in use?  Y  N

Other Environmental Issues:

None noted

**Staff Facilities Issues:**

Adequate space for working in, on and around apparatus?  Y  N

Adequate space for working on small equipment, hose, tools, etc.?  Y  N

Adequate space for safe and rapid response turnout?  Y  N

Adequate space for cooking and eating?  Y  N

Adequate space for training and company drills?  Y  N

Adequate space for personal hygiene?  Y  N

Adequate space for sleeping?  Y  N

Compromises necessary for two-gender staffing?  Y  N

List any staff facility issues or compromises made by crew to compensate for facility inadequacies:

The facility is for apparatus parking only. No consideration for future use as staffed facility. No space on parcel for expansion.

**Efficiency Issues:**

Describe any efficiency issues worth noting:

Very limited use. Apparatus parking only.

**Station Name/Number: Bailey Island Station**

<b>Station Amenities</b>	<b>Number</b>	<b>Comments</b>
Dept. Administrative Offices	0	
Station Watch Room/ Offices	0	
Communications / Dispatch	0	
Conference / Classroom	0	
Training Library	0	
Day Room / Lounge Area	0	
Kitchen	0	
Male Dormitory Sleep #	0	
Female Dormitory Sleep #	0	
Co-ed Dormitory Sleep #	0	
Male Restroom/Shower/Locker	0	
Female Restroom/Shower/Locker	0	
Co-ed Restroom/Shower/Locker	0	
Exercise / Work Out Area	0	
Back-In Bays	2	double-length bays
Drive-Through Bays	0	
SCBA Fill Station	0	
Laundry – Gear Extractor	0	
Laundry – Residential Type	0	
Turn Out Gear Room	0	
Storage Area		rear of bays

## APPENDIX D: Staffing Needs and Volunteer Sustainability

The American's with Disabilities Act (ADA) prohibits discrimination against individuals with physical disabilities, but permits employers to establish the physical standards that are required to perform the primary functions of any job safely and effectively. History has shown that the most effective method of avoiding a litigation suit involving ADA is through reasonable and consistent application of job/task-relevant pre-acceptance, appointment, and/or employment physical ability testing.

The United States Fire Administration and the National Volunteer Fire Council have recently released a comprehensive guide to volunteer recruitment and retention; *Retention and Recruitment for the Volunteer Emergency Services: Challenges and Solutions*.

“Among the challenges identified and addressed in the new guide are time demands, training requirements, increasing call volume, changes in the *nature of the business*, changes in sociological conditions, leadership challenges, federal legislation, internal conflict, higher cost of housing, aging communities, and effects of the decline in volunteers.”<sup>47</sup>

The guide, among many things, addresses factors that are truly altruistic and are a large part of the cornerstone of the volunteer fire service. The fire service is a natural place for people to serve their local community.

“It would appear that these issues could be addressed and improved upon with strong leadership. The officer corps must realize the value of positive reinforcement for individual members and they must understand that constant criticism will tend to drive people from the organization. A healthy organization climate is one that constructively addresses issues that need correcting but also enthusiastically recognizes the positive contributions by individual members.”<sup>48</sup>

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<sup>47</sup> Retention and Recruitment for the Volunteer Emergency Services: Challenges and Solutions. 2007 (Second Edition), United States Fire Administration.

<sup>48</sup> Retention and Recruitment for the Volunteer Emergency Services: Challenges and Solutions. 2007 (Second Edition), United States Fire Administration.

Of note is a survey conducted and published in the report addressing “What makes members want to volunteer?” “What keeps volunteers serving?” and “What makes your members leave your organization?” A synopsis of these findings is outlined below:

What makes members want to volunteer?

- Response to emergencies – 83.6 percent
- Family traditions – 61.9 percent
- Part of a team – 55.4 percent
- Social opportunities – 48.9 percent
- Need for affiliation – 29.3 percent
- Helping neighbors – 81.5 percent
- Feel needed – 41.3 percent
- Career development – 42.3 percent
- Personal skill and knowledge development – 39.1 percent

What keeps volunteers serving?

- State and local tax credits – 77.1 percent
- Length of service award from fire company/municipality – 63.0 percent
- Tuition reduction – 59.7 percent
- Access to group health insurance programs – 45.6 percent
- Group rates for auto and home insurance – 39.1 percent
- Access to group dental insurance programs – 32.6 percent
- Regular purchases of apparatus – 53.2 percent
- Friends/families also members (fraternalizing) – 52.1 percent
- Frequent social activities – 41.3 percent
- Praise 44.5 percent
- Cash per call responded to – 41.3 percent

What makes your members leave your organization?

- No time to volunteer – 92.3 percent
- Conflicts in the organization – 47.8 percent
- Organizational leadership creates adversity – 46.7 percent
- Too much training – 45.6 percent

- Attitude of existing personnel to newcomers – 39.1 percent
- Criticism received from officers and older members – 38.0 percent

People are willing to volunteer in the fire and rescue service provided the following are true:

- The experience is rewarding and worth their time.
- The training requirements are not excessive.
- The time demands are not excessive.
- They feel valued.
- Conflict is minimized.

The roots of retention and recruitment challenges are briefly identified in the following chart:

**Figure 88: Roots of Recruitment and Retention Challenges**

<b>Sources of Challenges</b>	<b>Contributing Factors</b>
Time Demands	<ul style="list-style-type: none"> <li>• The two income family working multiple jobs</li> <li>• Increased training time demands</li> <li>• Higher emergency call volume</li> <li>• Additional time demands within the dept.</li> </ul>
Training Requirements	<ul style="list-style-type: none"> <li>• Higher training standards and federal requirements</li> <li>• Greater public expectation of FD's response capabilities</li> <li>• Additional training demands to provide broader range of services</li> <li>• Recertification demands</li> </ul>
Increasing call volume	<ul style="list-style-type: none"> <li>• FD's assuming wider roles</li> <li>• Increasing medical call volume</li> <li>• Increasing automatic fire alarms</li> <li>• Greater reliance by public on FD services</li> </ul>
Changes in the "nature of the business"	<ul style="list-style-type: none"> <li>• Abuse of emergency services by the public</li> <li>• Less of an emphasis on social aspects of volunteering</li> </ul>
Changes in sociological conditions	<ul style="list-style-type: none"> <li>• Transience</li> <li>• Loss of community feeling</li> <li>• Less community pride</li> <li>• Less of an interest or time for volunteering</li> <li>• Two-income family and time demands</li> <li>• "Me" generation</li> </ul>
Leadership problems	<ul style="list-style-type: none"> <li>• Poor leadership and lack of coordination</li> <li>• Authoritative management style</li> <li>• Failure to manage change</li> </ul>
Federal Legislation and regulation	<ul style="list-style-type: none"> <li>• FLSA interpretations</li> <li>• "2-in, 2-out" rulings requiring four firefighters on scene before entering hazardous environments</li> </ul>
Increasing use of combination departments	<ul style="list-style-type: none"> <li>• Disagreements among chiefs or other department leaders</li> <li>• Friction between volunteer and career members</li> </ul>
Higher cost of housing	<ul style="list-style-type: none"> <li>• Volunteers cannot afford to live in the community they serve</li> </ul>
Aging communities	<ul style="list-style-type: none"> <li>• Greater number of older people today</li> <li>• Lack of economic growth and jobs in some towns</li> </ul>

*Retention and Recruitment for the Volunteer Emergency Services: Challenges and Solutions* provides a comprehensive analysis of volunteer retention and recruitment challenges and solutions. The following topical list of retention and recruitment challenges and solutions represents an outline of this analysis as an indication of the value of this reference to Harpswell.

Generally, the primary headings (letters) represent the challenge topics and the sub-headings (numbers) represent the solution topics.

1. Retention

A. Leadership

1. Management style
2. Mission statement
3. Long range planning, goals and objectives
4. Selection and tenure of the chief
5. Selection and tenure of the officers
6. Training of the chief and officers
7. Internal communications
8. Volunteer coordinator
9. Adopting department standards
10. Opportunities for advancement

B. Department image

1. Pride in the uniform
2. Pride in the department and community
3. Training in public
4. Delivering public fire safety and prevention programs
5. Well-maintained gear and apparatus
6. Demonstrating financial benefit to the community
7. Community newsletter
8. Use of the media
9. Customer service
10. Working with local politicians

C. Risks

1. Health risks
2. Medical examinations
3. Concerns of the family
4. Death and disability coverage
5. On duty injury and hospitalization insurance
6. Line of duty death and disability benefits
7. Liability coverage

- D. Relocation
  - 1. Transferring to other departments
  - 2. Reciprocity of training credentials
- E. Diversity of people and interests
  - 1. Fire and EMS members
  - 2. Females
  - 3. Minority groups
  - 4. Retired firefighters
  - 5. Non firefighting personnel
  - 6. “Burned out” or disabled members
  - 7. Learning disabled/mentally challenged
- F. Consolidation
- G. Attitude and motivational research
  - 1. Attitude research
  - 2. Motivational research
  - 3. Member surveys
  - 4. Exit interviews
  - 5. Evaluations
- H. Cohesiveness
  - 1. Cliques
  - 2. Females and minorities
  - 3. EMS and firefighters
  - 4. Handling grievances and problem volunteers
  - 5. Combination departments
  - 6. Encouraging teamwork
- I. Emotional Support
  - 1. Nurturing new members
  - 2. Nurturing all members
  - 3. Handling specific personal problems
  - 4. Employee assistance programs/member assistance programs
  - 5. The department as a family
  - 6. Stress debriefings
- J. Training requirements
  - 1. The dilemma of reducing training requirements

2. Provide training schedules
3. Training in modules
4. Training in context
5. Instructor competency
6. Provision of remedial help
7. Diversifying instruction
8. Out-of town training weekends
9. Training competitions

**K. Time Demands**

1. Evaluating requirements and improving efficiency
2. Narrowing assignments
3. Duty shifts
4. Leaves of absence
5. Screening calls and alarm malfunctions
6. Involving the family in the department
7. A new take on fire department auxiliaries
8. Involving the family in social functions
9. Selective paging
10. Handling the most demanding hours: weekday hours
11. Supplementary full-time personnel

**L. Recognition**

1. Newsletters
2. Thank you notes and greeting cards
3. Pictures
4. Press releases
5. National volunteer awards
6. State recognition
7. Local community recognition and heroism awards
8. Award banquets
9. Pats on the back

**M. Incentives**

1. Setting up an incentive system
2. Direct financial incentives
  - a) Retirement plans

- b) Pension plans
      - c) Length of service award programs
    - 3. IRAs
    - 4. Pay per call or per hour
    - 5. “Monthly Pot”
    - 6. Annual reimbursement
    - 7. Tax exemptions and deductions
    - 8. Health insurance
    - 9. Tuition assistance
    - 10. Housing assistance
    - 11. Special low interest housing loans
    - 12. In-season bonus
  - N. Indirect monetary incentives
    - 1. Local business accounts
    - 2. Other indirect monetary incentives
  - O. Uniform and department paraphernalia
  - P. Other incentives
  - Q. Equality in incentive system
  - R. Qualifying for benefits and incentives
  - S. The fun factor
    - 1. Social committee/social director
    - 2. Parties
    - 3. Prevention activities
    - 4. Making training enjoyable
    - 5. Other ways to have fun
    - 6. Increased range of services
    - 7. What to avoid
      - a) Alcohol
      - b) Drugs
2. Recruitment
- A. Citizens corps
  - B. Needs assessment
  - C. Qualities and skills to look for in volunteers
    - 1. Character qualities

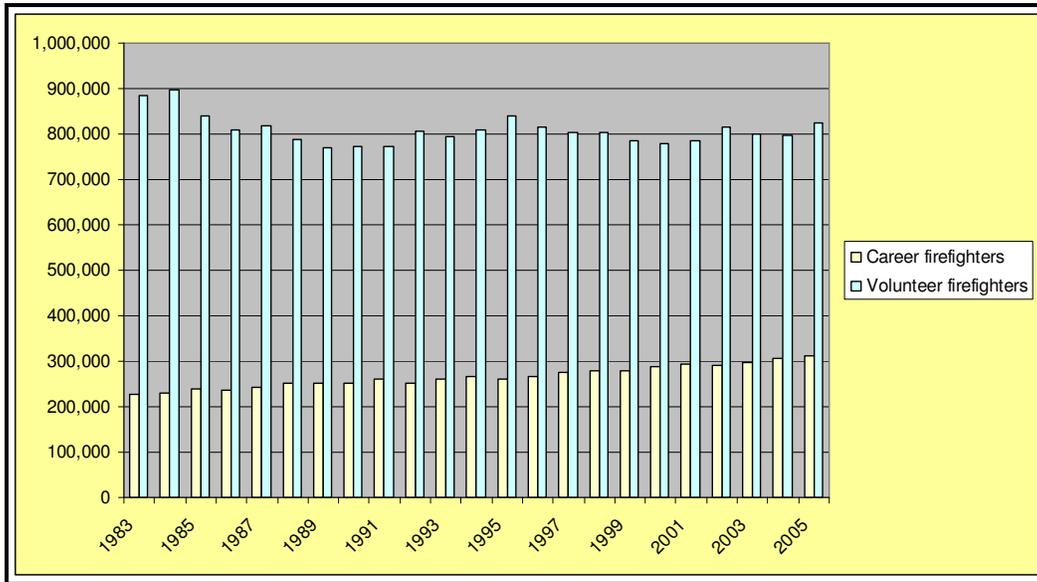
- 2. Education
  - D. Daytime availability
  - E. Geographically well-located
  - F. Young firefighters
  - G. Cadet training information
  - H. Previous public safety experience
  - I. Special skills
  - J. Who should do the recruiting
    - 1. Members
    - 2. Recruitment coordinator
    - 3. Recruitment committee
  - K. Where to look
    - 1. Personal contacts
    - 2. Door-to-door
    - 3. Dedicated recruitment telephone number
    - 4. Newcomer to town
    - 5. Schools
    - 6. Civic associations and churches
    - 7. Fire departments
    - 8. Local businesses
    - 9. Events
    - 10. Utility companies and local government employees
    - 11. Military bases and personnel
    - 12. Local stores, government offices, restaurants, and gyms
    - 13. Training the public
  - L. Recruiting messages
  - M. Message examples
  - N. Volunteering as career advancement
  - O. The true nature of the job
  - P. Firefighter checklist
  - Q. Use of various media
    - 1. Television, radio and print media
    - 2. Videotapes and multimedia shows
    - 3. Brochures

4. Direct mail
  5. Posters
  6. Signs at stations
  7. Advertisements on apparatus
  8. Informal station open house
  9. World Wide Web
  10. Other places to advertise
- R. Informational sessions
1. Volunteer firefighter job description
- S. Screening recruits
1. Who to accept
  2. Motivations
  3. Tests and background checks
  4. Interviews
  5. Driving and criminal records
  6. Commitment agreements
- T. Follow-through
1. Follow up on initial contacts
  2. Follow up after acceptance
  3. Opportunities to leave
- U. Barriers to recruiting
1. Exclusivity image
  2. Training burden
  3. Residency requirements
  4. Tenure requirements
- V. Recruiting special groups
1. Females
  2. Hispanics
  3. African Americans
  4. Native Americans
  5. Other minorities
  6. White-collar workers/college students
  7. Retirees
- W. The annual recruitment plan

X. The National 1-800-FIRE-LINE recruitment campaign

Although many believe that there has been a dramatic downturn in the numbers of volunteers in the fire service, the figure below actually indicates that, although mildly cyclical, volunteerism is relatively stable.

Figure 89: Historical Volunteerism Trend



This is not, however, true in every community. It has been ESCi's experience that areas with an aging population tend to have fewer volunteers. This is also true of more affluent communities where residents expect quality fire protection but few actively participate in the provision of those services.

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## APPENDIX E: Vehicle Considerations

### ***Front Bumpers***

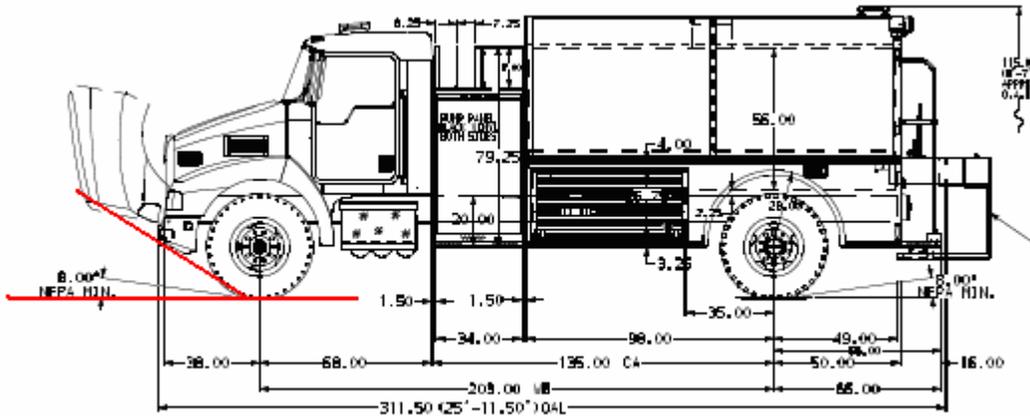
Although this particular topic is one that is frequently overlooked in the design of fire apparatus, under the right circumstances failure to recognize the significance of front bumper extensions could have a significant effect on a department's ability to effectively respond to requests for service.

During site visits, ESCi staff traveled to portions of the Town away from the main roadways. We found, apart from extreme narrowness of some of the roads, many of the more remote locations had very steep inclines and declines from a paved road surface to a gravel surface. Under normal circumstances (with typical passenger vehicles) these inclines and declines do not pose a potential risk. This is not the case with fire apparatus. The angle at which the front edge of the front bumper lies to the front wheel is known as the *angle of approach* and plays a significant role in the ability of a vehicle to navigate steep grade transitions. The following four figures are two examples of different angles of approach.

**Figure 90: Short Front Bumper – High Angle of Approach**



Figure 91: High Angle of Approach

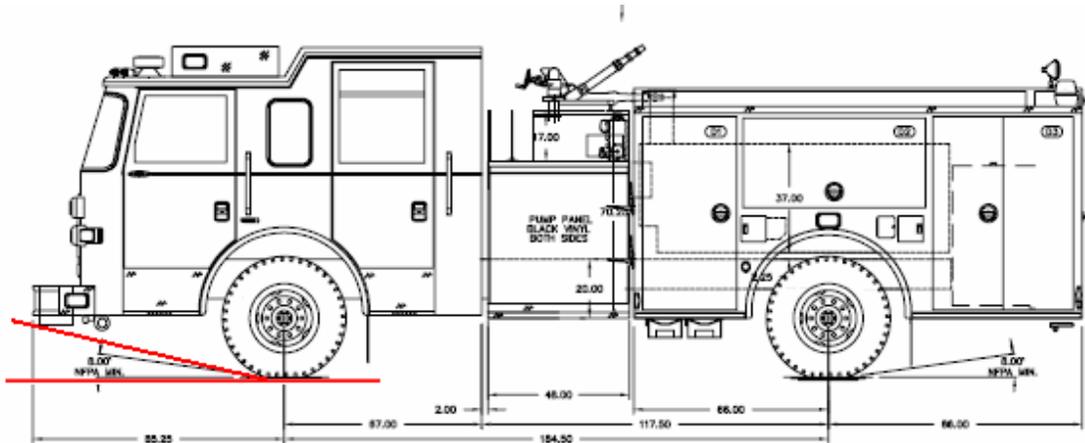


In this example, the front bumper is set in close to the front wheel, thereby increasing the angle of approach and reducing the likelihood of bumper drag when encountering steep inclines and declines.

Figure 92: Long Front Bumper



Figure 93: Low Angle of Approach



The opposite is true here. In this example, the front bumper is set out from the front wheel, thereby decreasing the angle of approach and increasing the likelihood of bumper drag when encountering steep inclines and declines. The further the front bumper is set from the front wheel, the lower the angle of attack, and the higher the likelihood of bumper drag. The minimum angle of approach standard set by NFPA is eight degrees. As is evident from Figure 92, the angle of approach is nearly at the recommended minimum, whereas the drawing in Figure 90 is well above the recommended minimum.

### ***Wheel Base and Turning Radius***

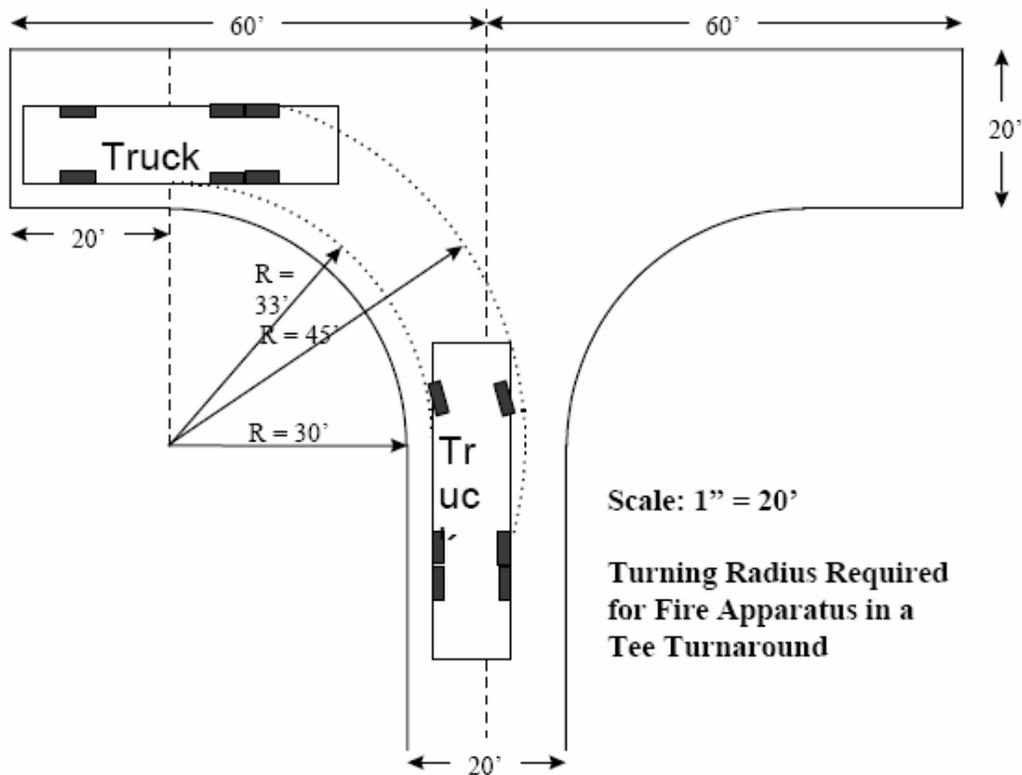
The overall length of a vehicle is many times determined by its wheel base; the distance from the center of the front wheels to the center of the rear wheels. Wheel base directly affects turning radius as longer vehicles need more room to make turns. The figure below illustrates what is known in the fire service as a *quint*.

Figure 94: Quint - Long Wheel Base



The following figure is a typical illustration of the space necessary to turn a large fire apparatus. As the wheel base increases, so does the turning radius.

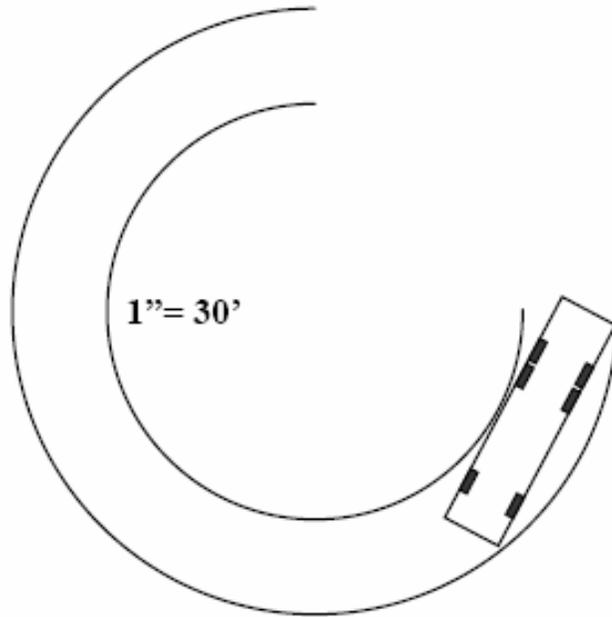
Figure 95: Typical Hammerhead Intersection Necessary Radii



Source: Colorado Spring Fire Department, Office of the Fire Marshal

Figure 96 illustrates approximately how much space is needed to turn a truck company in a complete circle.

**Figure 96: Turning Radius for Truck Company**



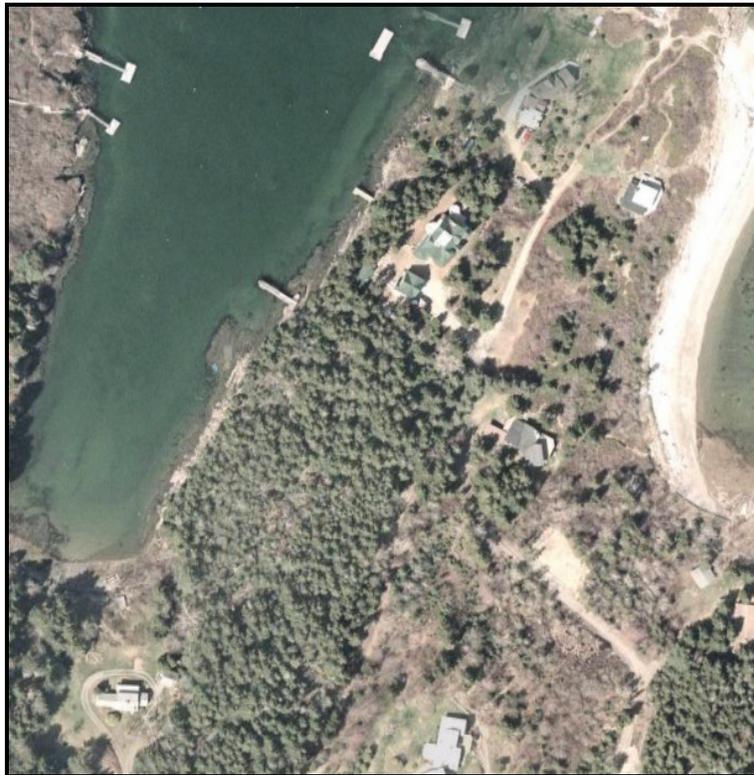
Source: Colorado Spring Fire Department, Office of the Fire Marshal

**Figure 97: Harpswell Neck Access Example**



This picture is an example of how difficult roadway navigation can be on Harpswell Neck roadways as the peninsula narrows. Access to these areas is not as much of an issue as is regress for additional water supplies or to return to service availability.

Figure 98: Bailey Island Access Example



This area of Bailey Island is nearly inaccessible and would be completely inaccessible if not for the short wheel base and tight turning radii of the OBIFD apparatus. It is unlikely that larger equipment would be able to access these areas, thereby making them obsolete for the community.

The same is true of the area near Cundy’s Harbor pictured below. As more development occurs along the Town’s waterfront, accessibility will become an increasingly important issue. In addition to addressing accessibility issues through control of fire apparatus purchases, the Town should begin to address the issue through planning and zoning enforcement that implements a minimum standard of access for emergency vehicles to all new development.

**Figure 99: Cundy’s Harbor Access Example**



ESCi does not assume that all apparatus maneuvers will be complete as the figures above indicate. Through our own experience, ESCi understands the necessity to sometimes make multi-point turns with large apparatus. The point is, in the interest of saved time, the apparatus should be designed with the local community in mind, and in regards to being able to respond as quickly as possible, including the ability to turn around quickly if necessary.

## APPENDIX F: Maine Fire Training and Education Matrix

Jones & Bartlett/MFE Firefighter Training Curriculum Plan																							
Suggested Chapter Groupings																							
June, 2005 version																							
Firefighter I																							
Interior Structural Firefighter																							
Exterior Firefighter																							
Responder																							
Mem.																							
Firefighter I Academy																							
Cert.																							
Compl. Fast Trac																							
Bridge to FFI-II																							
Cert. FF 2																							
Haz. Mat. Aware. Op.s.																							
Code #	Chapter #	Chapter Title	Minutes	ProgTime	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F01	1	History & Orientation	240	1/2-day	X										X			X	X				
F02	2	Fire Fighter Qualifications & Safety	415	1-day		X									X			X	X				
F03	3	Fire Service Communications	225	1/2-day	X										X			X	X			X	
F04	4	Incident Management Systems	250	1/2-day	X										X			X	X				
F05	5	Fire Behavior	280	1/2-day	X										X			X	X				
F06	6	Building Construction	285	1/2-day								X			X		X	X	X		X		
F07	7	Portable Fire Extinguishers	455	1-day			X*								X*		X*	X*	X*				
F08	8	Fire Fighter Tools & Equipment	345	1/2-day			X*								X*		X*	X*	X*		X		
F09	9	Ropes & Knots	540	1-day			X*								X*		X*	X*	X*		X		
F10	10	Response & Size-Up	220	1/2-day		X*									X*		X*	X*	X*		X		
F11	11	Forcible Entry	420	1-day			X*								X*	X*	X*	X*	X*		X		
F12	12	Ladders	510	1-day			X*								X*	X*	X*	X*	X*				
F13	13	Search & Rescue	460	1-day				X*							X*	X*	X*	X*	X*				
F14	14	Ventilation	520	1-day				X*							X*	X*	X*	X*	X*			X	
F15	15	Water Supply	290	1/2-day					X*						X*	X*	X*	X*	X*			X	
F16	16	Hose, Nozzles, Streams, & Foam	1045	2-days						X*					X*	X*	X*	X*	X*		X		
F17	17	Fire Fighter Survival	235	1/2-day		X*									X*	X*	X*	X*	X*				
F18	18	Salvage & Overhaul	410	1-day							X*				X*	X*	X*	X*	X*		X		
F19	19	Fire Fighter Rehabilitation	175	1/4-day		X*									X*	X*	X*	X*	X*				
F20	20	Wildland & Ground Fires	245	1/2-day									X		X*	X*	X*	X*	X*		X		
F21	21	Fire Suppression	460	1-day							X*				X*	X*	X*	X*	X*		X		
F22	22	Pre-Incident Planning	275	1/2-day							X				X	X	X	X	X		X		
F23	23	Fire & Emergency Medical Care	145	1/4-day								X			X	X	X	X	X		X		
F24	24	Emergency Medical Care	630	1-1/4-days								X			X	X	X	X	X		X		
F25	25	Vehicle Rescue & Extrication	245	1/2-day								X*			X*	X*	X*	X*	X*		X		
F26	26	Assisting Special Rescue Teams	275	1/2-day									X		X	X	X	X	X		X		
F27	27	Haz Mat: Overview	145	1/4-day										X	X*	X*	X*	X*	X*		X		X
F28	28	Haz Mat: Properties & Effects	160	1/4-day										X*	X*	X*	X*	X*	X*		X		X*
F29	29	Haz Mat: Recognition & Identification	245	1/2-day										X*	X*	X*	X*	X*	X*		X		X*
F30	30	Haz Mat: Implementing a Response	140	1/4-day											X*	X*	X*	X*	X*		X		X*
F31	31	Haz Mat: Scene Safety & Control	245	1/2-day											X*	X*	X*	X*	X*		X		X*
F32	32	Haz Mat: Response Priorities & Actions	170	1/4-day											X*	X*	X*	X*	X*		X		X*
F33	33	Haz Mat: Decontamination Techniques	215	1/2-day											X*	X*	X*	X*	X*		X		X*
F34	34	Terrorism Awareness	330	1/2-day											X*	X*	X*	X*	X*		X		X
F35	35	Fire Prevention & Public Education	185	1/4-day								X*			X*	X*	X*	X*	X*		X		X
F36	36	Detection, Protection, & Suppression Systems	280	1/2-day								X*			X*	X*	X*	X*	X*		X		X
F37	37	Fire Cause Determination	185	1/4-day								X*			X*	X*	X*	X*	X*		X		X
Breakdown of Blocks																							
* Indicates prerequisites chapters apply, see chapter prerequisites table for guidance																							
F51	Block 1	General Knowledge		2-days																			
F52	Block 2	Response		2-days																			
F53	Block 3	Fundamentals		2-days																			
F54	Block 4	Initial Attack Skills		2-days																			
F55	Block 5	Tactical Support Skills		2-days																			
F56	Block 6	Hose / Water Supply		2-days																			
F57	Block 7	Suppression		2-days																			
F58	Block 8	Fight Fire Smart		2-days																			
F59	Block 9	EMS / Vehicle Rescue		2-days																			
F60	Block 10	Wildland / Haz-Mat Awareness		1-day																			
F61	Block 11	FF I Academy: Part 1		6.75-days																			
F62	Block 12	FF I Academy: Part 2		7-days																			
F63	Block 13	FF I Academy: Part 3		7-days																			
F64	Block 14	FF I Certification																					
F65	Block 15	Compliance Fast Trac		13-days																			
F66	Block 16	Bridge from Fast Trac to FFI-II		10.5 days																			
F67	Block 16	FF II Certification																					
F69	Block 17	Haz-Mat Awareness		1-day																			
F68	Block 18	Haz-Mat Operations		2-days																			

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## APPENDIX G: Cooperative Service Strategies

This appendix summarizes areas that ESCi believes the Town could benefit from in regards to cooperative services. These cooperative interactions will allow each department serving Harpswell to maintain their autonomy and identity, while allowing the Town to give input into certain provision aspects of fire and emergency services to the jurisdiction. These areas also encourage greater efficiency and standardization across geographical boundaries to increase consistency among the departments

It is important to point out that some departments are already working to implement select concepts. Regardless of the existing level of implementation, ESCi is providing detailed information on all strategies to give the reader a complete picture of cooperative strategy potential. The discussion of each cooperative strategy includes a listing of affected departments. Consequently, the summary description may indicate bearing on more departments than would seem intuitive.

## **A – Develop Standard Operating Guidelines**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Short-term

### ***Section***

- Emergency operations

### ***Affected Stakeholders***

- All departments

### ***Objective***

- Provide guidelines for operation during emergencies; emergent and non-emergent incidents.

### ***Summary***

Standard operating guidelines are used at the operations level of the fire department. They are analogous to a playbook, providing direction yet allowing for individualized company officer adjustments to situations. Currently, each fire department is responsible for developing a unique set of standard operating guidelines for their organization.

### ***Discussion***

Standard operating guidelines will improve on-scene safety, efficiency, and effectiveness of personnel. With personnel from all departments trained in using the same procedures, they can approach an incident with an understanding that everyone will proceed in a similar fashion. This will greatly reduce or eliminate the confusion that can lead to delays in the delivery of service.

### ***Guidance***

- Keep the guidelines in electronic format for ease of updating.
- Give initial and recurring education to personnel in their use.
- Provide for continual use of the standard operating guidelines during routine incidents and at each training session.
- Provide for a periodic appraisal of the guidelines to maintain currency with changes in tactics, strategy, and equipment.
- Consciously keep guidelines non-specific to allow for adaptation to particular incidents by the supervisor.

### ***Fiscal Considerations***

- Instructional time optimized during multi-department training sessions by excluding time devoted to adapting to differing procedures.

## **B – Develop a Joint Purchasing Consortium**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Long-term

### ***Section***

- Support services

### ***Affected Stakeholders***

- All departments

### ***Objectives***

- Develop a joint purchasing consortium that promotes improved operational readiness and that achieves procurement efficiencies by eliminating duplication in the acquisition and distribution of supplies.
- Create a uniform set of standards for apparatus, small equipment, PPE (personal protective equipment), emergency supplies, and information system/information technology (IS/IT) services.
- Develop a joint preventative maintenance and repair service program for physical assets, apparatus, small equipment, and IS/IT systems.

### ***Summary***

Throughout nearly every public or private emergency preparedness institution, the state of readiness and effectiveness is highly dependant on support services. Support services assure the materials necessary to keep a department operational and functioning. Every fire department (whether large, small, paid, volunteer, city, or district) provides some form of support services within their organization.

Support services offered under a joint purchasing consortium can be modular and may include:

- Standardization of apparatus, equipment, and PPE
- Standardization of fire/EMS/rescue supplies
- Centralized purchasing and distribution
- Centralized fleet and equipment maintenance
- Mobile maintenance services
- A preventative and safety maintenance program for facilities, apparatus, equipment, and other physical assets

The purchasing program can create joint bids for supplies and equipment, and can achieve additional benefits such as integrated inventory of supplies that can accommodate lag times in deliveries from manufacturers and suppliers.

***Discussion***

Joint Purchasing Consortium – At the heart of any emergency fire department are the activities and functions that support the delivery of emergency services. Support services keep department assets in operational readiness, and ensure that enough supplies, tools, and equipment are available for emergency workers to mitigate the emergency. Every department in this study dedicates a certain level of daily effort in maintaining emergency apparatus and equipment.

Although the Harpswell area fire departments are emergency service providers, they also are businesses that spend tens of thousands of dollars each year to ensure emergency mission readiness. Like all businesses, fire departments need to be receptive to new practices to maximize the effectiveness of budget dollars. Such practices may take the form of economies of scale, administrative efficiencies, paperwork reduction, technological advances, and innovative cost saving concepts. The fire service has been slow to capitalize on the benefits of joint purchasing. Most private organizations and many public agencies have been realizing the benefits for years.

Acquiring and maintaining physical assets (facilities and grounds), IS/IT systems, vehicles, and equipment, is a labor intensive process requiring good policies and attention to detail. The procurement and distribution of routine supplies is also an important behind the scenes process that needs hands on work and meticulous recordkeeping. Because of the variety and size of the participating fire departments, these support services are currently provided by a variety of full-time, part-time, and/or suppression employees. In all cases, filling the demand for support services is a constant necessity in any organization; vital to ensuring the operational readiness of the department.

Key elements of a joint purchasing consortium are:

- Assessment of current assets
- Assessment of current levels of support service activities
- Standardization of apparatus, equipment, and supplies
- Standardizing preventative maintenance programs and recordkeeping
- Centralization of apparatus and equipment repair and maintenance
- Provisions for mobile repair and maintenance services during emergency incidents
- Centralization of supply and equipment acquisition and distribution
- Development of a facilities and grounds maintenance program
- Standardization of IS/IT services

As listed above, a key to realizing the benefits of shared support services is standardization of apparatus, equipment, and supplies. In this exercise alone, standardization assures greater financial and operational efficiency and effectiveness. Fundamentally, this is the most important aspect of forming a joint support division.

Standardizing specifications for the purchase, repair, and maintenance of apparatus, SCBA (self-contained breathing apparatus), communication devices, and miscellaneous equipment often equates to less out-of-service time. Support personnel will need to be certified for repairing and maintaining fewer apparatus and equipment types. Fewer parts need to be stocked for repair and maintenance. Such practices are described as *economies of scale*.

*NFPA 1915* points out that repairs by qualified technicians may provide longer apparatus life, safer operations and the early detection of maintenance and repair problems.<sup>49</sup> The result is often a short- and long-term saving on rolling stock and small equipment. A centralized repair and maintenance facility cooperatively organized as a support services division ensures that routine maintenance and repairs of physical assets are completed in a timely manner. Maintaining public assets in this way is a demonstration of stewardship.

The standardization of apparatus, equipment, and supplies plays strongly into the overall effectiveness and efficiency of daily emergency operations. Standardized support functions are

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<sup>49</sup> National Fire Protection Association, Standard 1915: *Standard for Fire Apparatus Preventive Maintenance Program*, 2000 Edition

a key part of unified emergency operations and response – especially when equipment from multiple fire departments works together at large-scale emergencies.

A multi-department purchasing program could improve management of the departments' supply chains. In theory, the departments would collectively create or contract for a logistics center to manage procurement and distribution. The program would follow state and organizational purchasing guidelines and make supplies and equipment available to all of the member departments.

Distribution can be managed internally, or through agreements with suppliers to gain the advantages of collective purchasing and supply: 1) a larger, collective bid process for supplies can achieve lower prices and attract additional competitors; 2) the logistics center can negotiate terms of the conditions of the sale that might not be available to smaller purchasing centers; and 3) it can conduct collective bidding processes that are applicable to all of the departments.

Coordination is important to the success of a joint purchasing program. Each of the departments currently conducts purchasing of virtually all supplies and equipment independently. As such, a joint effort will reduce the work required by any single department to provide purchase and provide supplies.

### ***Critical Issues***

- Coordination issues
  - A cross-functional committee of system purchasing agents and system participants can work together to design purchasing rules for each department.
  - The committee can provide a standardized equipment list for departments. The departments can share bidding processes, so that the bidding procedure used by the purchasing agent can be used by all departments.
  - Departments must work closely with the cross-functional committee to ensure that the goods are received and distributed to the appropriate location.
  - Fire departments should have agreements in place to specify inventory and purchasing plans.
- Receiving and distribution considerations
  - Fire department partners should design distribution plans to deliver goods directly to the appropriate location. Using a joint purchasing system, the departments will no longer have to receive goods at the department; instead, they can receive goods at the appropriate station.

- The departments can jointly determine the proper level of inventory to maintain within the system. The use of system-wide inventory planning ensures that the most cost-effective inventory management can be established for the system participants.
- Financial and fiscal considerations
  - Cost saving can be achieved through reducing inventory carrying costs, reducing transaction costs, and achieving economies of scale through larger volume purchasing.
  - The participating departments should agree on contributions to account for more difficult to discern costs such as freight charges and unit costs for warehousing space.

### **Guidance**

- Develop a system-wide, cross functional committee to explore a joint purchasing process.
- Work with elected officials to adopt purchasing requirements that help the departments meet purchasing goals and guidelines.
- Establish standards for fire and EMS system equipment and supplies.
- Establish inventory standards and methods for distributing equipment and supplies.
- Develop specific standards for apparatus, equipment, PPE, SCBA, communication equipment, and supplies.
- Inventory and evaluate current physical assets, apparatus, equipment, and operational/facility supplies.
- Contract for or align departments to provide logistics and supply services.
- Evaluate other cooperative support service programs throughout the area.
- Determine support components that would best benefit all departments immediately and long term for program expansion.
- Evaluate current levels of support functions and identify successful elements to incorporate into the joint program
- Create PLLs (prescribed load list) for apparatus, sometimes referred to as an ASL (authorized stockage list).
- Ensure that all aspects of a joint support division are based on recognized local, state, and national standards as well as manufacturer's recommendations for repair and maintenance.
- Determine the most efficient and effective location for support functions. This may include multiple facilities that are strategically located.
- Develop a mobile maintenance/repair program.
- Involve Harpswell fire departments, but consider the benefits of expanding program to other local government entities.
- Evaluate value in outsourcing of support services.

***Fiscal Considerations***

- The soft cost generated by cross functional committee meetings necessary to accomplish objectives of the program.
- Incremental costs of transitioning to standard apparatus, PPE (personal protective equipment), SCBA (self-contained breathing apparatus), and small equipment.
- Expected cost savings and operational benefits will result from:
  - Elimination of duplication of services, administration, training, supplies, parts, and equipment.
  - Standardization of equipment, parts, and operational/facility supplies.
  - Effective acquisition, accountability, and distribution of supplies and equipment.
  - Bulk purchasing.
  - Preventive maintenance of physical assets, apparatus, and equipment for optimum safety and readiness.
  - The elimination or reduction of *outside* costs for repair, maintenance, and servicing of physical assets and equipment.

***Notes***

The departments currently purchase insurance and coordinate the scheduling of inspections provided by third parties to minimize travel costs. Southern Maine EMS has negotiated discounted pricing for most common consumable supplies on behalf of the EMS organizations in Southern Maine. This optional recommendation is an expansion of practices already being utilized.

## **C – Develop a Harpswell Fire Safety Education Coalition**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Mid-term

### ***Section***

- Fire prevention

### ***Affected Stakeholders***

- All departments

### ***Objective***

- Provide for the cost effective, regional dissemination of public fire safety education.

### ***Summary***

Preventing fires is known to be far more cost effective than extinguishing them. One widely recognized and very successful method of preventing fires is through a multi-faceted public fire safety education program. The public fire safety education programs currently offered by the individual fire departments vary. Some joint effort in this regard is currently underway. The departments do work together to provide education to local schools during Fire Prevention Week.

### ***Discussion***

Successful public education programs use a range of communication methods, many of which cannot be limited to a specific geopolitical boundary. Television and radio for instance, are regional media that overarch jurisdictional limits delivering information to citizens in a wide variety of communities. For fire safety campaigns to be most effective, each must be designed to target a specific audience and each must be crafted for the means of delivery.

Creation of a public education coalition will help to standardize fire safety messages across the region and work to reach more of the target audience. This, in turn, will allow for reduced cost to each department through sharing, while improving the quality of programs in those communities with few or no public education resources. Costs can also be reduced through quantity purchasing of handouts and other public education materials. Increased training can be made

available to the public education staff, engine company crews, and others to enhance the quality of the fire prevention effort in those communities now lacking such programs.

***Guidance***

- Formalize the creation of the coalition through a written agreement.
- Involve others from outside the area and from non-traditional groups (insurance industry, educators, State Fire Marshal, media, etc.).
- Create standardized messages that can be used across the area.
- Learn from others. Model the coalition after other successful regional public fire safety education programs.

***Fiscal Considerations***

- The elimination of duplicated staff effort in the creation and distribution of public fire safety education messages reduces soft costs.
- Cost savings can be achieved through group purchasing of materials and other media.
- Departments currently without a presence in public education efforts would see a cost increase.

## **D – Create a Unified Occupational Medicine Program**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Mid-term

### ***Section***

- Administration

### ***Affected Stakeholders***

- All departments

### ***Objective***

- Provide a fire-service related occupational and health program.

### ***Summary***

A single method and source for providing occupational and health services may provide savings through economies of scale. Some effort in this regard is currently underway as the CHVFD and OBIFD have both expressed interest in joining HNFR in the use of Occupational Testing Company in West Bath. *NFPA 1500: Standard on Fire Department Occupational Safety and Health Programs* provides the minimum requirements for a fire-service related occupational safety and health program. Along with *NFPA 1500*, *NFPA 1582*, the *Standard on Comprehensive Occupational Medicine Programs for Fire Departments*, and related documents, provide guidance for the creation of occupational health programs and for establishing medical requirements for current and future firefighters.

### ***Discussion***

There is a need for all Harpswell area fire departments to have access to a group of professionals with expertise in the occupational medicine field. Occupational medicine is dedicated to promoting and protecting the health of workers through preventive services, clinical care, research, and educational programs. One aspect of a program is keeping up-to-date with health and safety regulations, standards, and current practices. Occupational medicine specialists review current practices to see if the departments meet new regulations, make modifications if needed, and assist the departments in adopting any changes.

The importance of employee health and welfare, and the potential liability associated with the lack of such programs necessitates that fire departments establish close professional relationships with occupational medicine specialists to assure that emergency workers are protected by the most up-to-date occupational health and safety programs possible.

Occupational safety and health programs (sometimes referred to as industrial medicine) vary in depth, form, and delivery. A fire department may employ a physician full-time, contract with a provider organization, or conduct a program part in-house while contracting for the remaining services.

The legal requirements for a fire department occupational safety and health program have been established. How a fire department administers and supports the program determines the success and the resultant benefit. In the example, the department previously had to hire extra staff, or pay employees overtime to take annual medical physicals. The occupational medical program resulted in the saving of more than fifteen thousand dollars through reduced overtime cost; however, some funding is still required for medical follow-ups and for employees not able to meet the schedule.

An additional advantage of using a local occupational safety and health provider is the ability to quickly evaluate and treat non-threatening injuries suffered by employees.

***Guidance***

- Determine required and desired specifications for an occupational safety and health program.
- Create a single personnel policy for occupational safety and health.
- Develop an RFP for soliciting vendors to supply occupational safety and health services.
- Conduct baseline testing for firefighters without previous audio and lung function baseline records.

***Fiscal Considerations***

- Occupational medicine programs are often menu driven. Items selected for inclusion in the program determines the final cost. Additional financial factors involve whether the fire departments elect to exceed mandated requirements, perform some of the occupational medicine functions internally, or consolidate the occupational medicine program with interrelated programs. Interrelating programs that share functions include wellness, infectious disease, FIT testing, EMS, and hazardous materials.

## **E – Implement a Standardized Computerized Records Management System**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Mid-term

### ***Section***

- Training

### ***Affected Stakeholders***

- All departments

### ***Objective***

- Provide a fully integrated comprehensive training records management system (RMS).

### ***Summary***

Computerized RMSs provides for ease of data entry, retention, and accessibility. RMSs are designed to provide comprehensive information regarding an individual, company, station, shift, and department training status. All RMSs are designed to query records and generate a variety of user-defined reports.

The fire departments unilaterally selected their RMS, resulting in a diversity of products. All of the departments maintain training records in hard copy format to one degree or another. Although the departments attempt to make good use of their system's capabilities, no department takes full advantage of RMS capabilities. *NFPA 1401, Recommended Practice for Fire Service Training Reports and Records* provides standards for recordkeeping systems.

Some consideration is currently underway for CHVFD to implement the RMS used by HNFR and OBIFD. The next logical step would be to enable the merging of this data for use in Town-wide analysis of demand and performance.

### ***Discussion***

An assortment of factors including a lack of support, the time to become proficient with, and software limitations frustrate and prevent users to fully use RMSs. The use of a standard RMS in Harpswell would rectify the ineffectiveness that presently exists.

With a Town-wide RMS, one administrative staff person would work collectively with all users to instruct, maintain, and troubleshoot the system. The ability to use the system to its maximum potential, and to retain and generate meaningful reports is improved. An environment is created for system users to share knowledge, experience, and assist one another in problem resolution.

The ability to cooperatively track and assess training information would foster the development of a unified training manual, and an annual training plan. Future enterprises may benefit from a single RMS including recruit training, career development, in-service, officer, and specialized training programs. A training RMS will aid department/division heads in budget planning, training delivery, and with resource and risk management.

### ***Guidance***

- Establish a work group including at least one training representative from each department.
  - Identify system requirements and needs of involved departments.
  - Evaluate the RMS used by the Harpswell departments, including justification for their use.
  - Evaluate other available RMS systems and select an RMS that most adequately satisfies mutual requirements, needs, and budget.
- Each department should share in the cost of an individual to administer and manage the training RMS. Including:
  - Training RMS management.
  - Oversight of hardware and software installation.
  - Providing for the initial and ongoing RMS training for end users.
- Determine server requirements for training RMS.
- Use existing or establish an Intranet or Internet network.
- Provide for RMS maintenance and troubleshooting services.
- Acquire technical assistance for RMS programming.
- Provide for a periodic appraisal of the RMS.

***Fiscal Considerations***

- A reduction in duplicated effort (reduces soft costs) in acquiring, learning, and maintaining, individual systems.
- Economies of scale in the collective purchase, use, and maintenance of a single RMS.
- Cost to purchase, administer, maintain, or modify existing network.
- Personnel costs associated with RMS committee, training, and implementation.

## **F – Develop and Adopt Common Training Standards**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Short-term

### ***Section***

- Training

### ***Affected Stakeholders***

- All departments

### ***Objectives***

- Adopt uniform training guidelines
- Adopt uniform certification standards

### ***Summary***

Training standards provide the benchmark for training. They define and specify the quantity and quality of training for achieving levels of competency and certification. Certain standards are mandated by governing or regulating agencies such as OSHA (Occupational Safety and Health Administration). Others are considered industry standards developed by organizations like the NFPA. Occasionally, locally developed standards are adopted to address circumstances unique to that area. Private vendor standards and certifications are often applicable to specialized training.

Training records should consist of:

- Daily training records
- Company training records
- Individual training records
- An inventory of equipment assigned to the training department
- A complete reference library

### ***Discussion***

By collectively adopting a set training standard (IFSTA for example), the fire departments are foundationally prepared to move forward with an RMS. The adoption of standards would provide uniformity throughout the training delivery system and would improve inter-agency compatibility.

It would further simplify development of a standard training manual, annual training plan, and data entry and retrieval of computerized training records. Adoption will provide for uniformly trained and certified responders, and will assure increased emergency scene compatibility, efficiency, effectiveness, personnel confidence, and emergency scene safety.

**Guidance**

- Establish a work group including at least one training representative from each Harpswell area fire department.
  - Identify mandated training standards affecting all departments.
  - Assess all other standards used by the fire departments, including rationale for their use.
  - Consider any unique local issues.
  - Develop a process for the adoption of town-wide training standards.
  - Adopt training standards to which all town departments will adhere.
  - Provide for continuous review and updating of training standards.
- Educate personnel on the purpose and application of the standards.
- Provide for continual use of training standards throughout the training delivery system.
- Maintain standards in a readily available format.
- Provide for frequent evaluation and updating of training standards.
- Address and resolve personnel certification issues (address through reciprocity) created by new standards and certifications.

**Fiscal Considerations**

- A potential for reduced specialized training costs through a larger pool of personnel.
- Responders trained to the same standard provide a more cohesive workforce, increasing efficiencies.

**G – Create a Harpswell Fire Training Manual**

***Level of Cooperation***

- Functional

***Timeline for Completion***

- Short-term

***Section***

- Training

***Affected Stakeholders***

- All departments

***Objective***

- Provide consistent, standardized training procedures

***Summary***

Fire department instructors use manuals based on national, state, and local standards as a resource to develop lesson plans for classroom and field training. Training sessions provide students with the knowledge, skills, and abilities to perform in emergency and non-emergency situations.

***Discussion***

Until now, each fire department unilaterally selected training materials from a variety of options. Not surprisingly, training and performance varied across the Town. The creation and use of a standard training manual will provide for more consistent training, better on-scene coordination, and improved firefighter safety.

As firefighters of the local departments are trained in the same procedures, each can respond to an emergency with the confidence that all responders are prepared to work effectively as a team. This will improve the willingness of firefighters from different departments to work together as a coordinated emergency workforce. Standardized training procedures improve on-scene safety, efficiency, and effectiveness.

Care should be exercised to prevent the development process from taking too long. To expedite progress, ESCi recommends adopting material from existing model training manuals, hose evolutions, and standard operating guidelines will be helpful. A resource for obtaining materials

can be found through the BFST Fire Standards Section, Western Fire Chiefs Association (WFCA), State Fire Marshal, and the National Fire Academy.<sup>50</sup>

Model fire department training material is readily available through non-profit organizations and private companies. Sources for commercially available training material include the Fire Department Training Network (FDTN), Thomson Del Mar, and Oklahoma State University. The International Fire Service Training Association (through Oklahoma State University) and Fire Protection Publications (FPP) have been longstanding producers of training manuals, course curricula, and audiovisual aids for fire departments.

NFPA recommended practices and standards can also assist with the development of the training manual. Relevant standards include:

- *NFPA 1401: Recommended Practice for Fire Service Training Reports and Records*
- *NFPA 1403: Standard on Live Fire Training Evolutions*
- *NFPA 1404: Standard for Fire Service Respiratory Protection Training*
- *NFPA 1410: Standard on Training for Initial Emergency Scene Operations*
- *NFPA 1451: Standard for a Fire Service Vehicle Operations Training Program*

The need for training of personnel with specialized duties should be included in the training manual. Assistance is available through the BFST Fire Standards Section.

### **Guidance**

- Establish and maintain a user group that meets regularly.
  - Include at least one training representative from each department.
- Develop and adopt a single training manual.
- Place the training manual in electronic format for easier updating and to allow access by firefighters.
- Provide for coordinated training of all departments.
- Provide for regularly scheduled multi-department drills.
- Provide for a regular evaluation and review of the training manual for applicability to pertinent laws, industry standards, and local standard operating guidelines.

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<sup>50</sup> Western Fire Chiefs Association, National Fire Service Library, [www.wfca.com](http://www.wfca.com), Department of Homeland Security, Federal Emergency Management Agency, U.S. Fire Administration, National Fire Academy, Training and Education.

- Seek out existing procedures for use in development of the training manual.

***Fiscal Considerations***

- Instructional time is likely impacted during multi-department training sessions by reducing or eliminating the time devoted to adaptive or remedial training.
- An emergency workforce trained under a cooperative system is more efficient and effective in reducing property damage and loss during emergency incidents.
- A workforce trained to operate under universal standards will experience fewer emergency scene injuries.

## **H – Develop an Annual Harpswell Fire Training Plan**

### ***Level of Cooperation***

- Functional

### ***Timeline for Completion***

- Short-term

### ***Section***

- Training

### ***Affected Stakeholders***

- All departments

### ***Objectives***

- Provide standardized and consistent training
- Provide a well-trained emergency workforce
- Provide long-term vision and direction for training delivery

### ***Summary***

The 2007 version of *NFPA 1500* states, "The fire department shall provide training and education for all department members commensurate with the duties and functions that they are expected to perform."<sup>51</sup> Two fire departments in this study address annual planning for fire and EMS training. The other departments have no training plan or training schedule that extends for a period of time greater than one month.

A formalized training plan provides the guidance for meeting training requirements. The plan and subsequent training is used to ensure that firefighters are competent, certified, and possess the ability to safely deal with emergencies. Training priorities are established by evaluating responder competencies to training mandates, requirements, desired training, and with the emergency services being delivered. Contemporary training delivery often revolves around performance or outcome-based training.

An annual training plan should reflect priorities by identifying the training that will occur. Training topics, general subject matter, required resources, responsible party, tentative schedule, and

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<sup>51</sup> *NFPA 1500: Standard for Fire Department Occupational Safety and Health Programs, Training and Education*, 2007 Edition.

instructors are all covered in the plan. Rational for why certain topics were chosen (or not chosen) is also included in the plan.

### ***Discussion***

Planning is essential to a successful training division, functioning much like the rudder of a ship. To efficiently plan the direction of a training program, complex factors must be considered including training mandates, department type, personnel career development, unanticipated need, priorities, and finite training time. Successfully charting a course through such issues can be a daunting and overwhelming task for the lone training officer.

Currently, each fire department individually deals with the same or similar fire training responsibilities and issues — inefficiencies exist as a result. A single training plan is an opportunity to combine intellectual resources to exploit the strengths and assets of each department for mutual benefit.

*“Efficient training systems are those that identify what they do well and take advantage of the opportunities provided by other systems to supplement their efforts. Inefficient systems are those that try to be all things to all people, and in doing so, squander resources.”<sup>52</sup>*

Determining the level of training that will be supported is crucial. Develop the annual training plan accordingly, and deliver the training that directly supports those levels. For example, training could be directed at supporting certifications of Firefighter I, Fire Officer I, and Apparatus and Pump Operator. A pool of instructors that are experts in that subject can be developed from those with the interest, qualifications, and expertise.

Developing and carrying through with a well conceived and coordinated training plan can improve on-scene safety, efficiency, and effectiveness of personnel. With personnel from all departments trained from the same plan, an emergency incident may be attacked with an expectation as to the level of training and skill set of the responders. The training plan will also assist in the planning and tracking of employee development and certifications.

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<sup>52</sup> Department of Homeland Security, FEMA, U.S. Fire Administration, *The Future of Fire Service Training and Education Professional Status: Part Two – Training and Education*, page 1.

### **Guidance**

- Provide a coordinated training plan including:
  - All Harpswell departments.
  - Conduct didactic sessions via the video conferencing system.
  - Plan regular use of training facilities by all departments.
  - Schedule regular single department manipulative single and multi-company drills.
  - Schedule regular multi-department, multi-company manipulative drills.
- Establish and maintain a training committee that meets regularly. Include at least one training representative from each department:
  - Develop an annual training plan.
  - Publish, distribute, and implement the plan.
  - Provide an orientation for personnel of each department regarding the plan's purpose and contents.
  - Publish monthly training schedules based on the plan.
- Place the annual plan and monthly schedules in electronic format for distribution and ease of updating.
- Provide for periodic reviews and adjustments to the plan.
- Direct all curricula towards risk management.
- Include all hazards in the training plan rather than solely fire-related incidents. The fire service's response and mitigation missions have expanded greatly over the years and now include all disasters, natural and manmade.

### **Fiscal Considerations**

- An elimination or reduction in duplicated staff effort (reduced soft costs) in the creation and updating of multiple training plans.
- Instructional time is increased during multi-department training sessions with personnel trained to selected certification levels.
- A reduction in costs through coordination of shared training resources and equipment.